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High Performance Fighters. (K. Tank, Luftwissen, Vol. 10, No. 4, April, 1943, pp. 99-102.) (112/1 Germany.)

The author, who is the designer of the well-known F.W.190 fighter, briefly enumerates the desirable qualities of such aircraft; maximum possible horizontal speed at all altitudes, very high rate of climb and ceiling, highest possible diving speed, excellent manœuvrability. All these desirable features should be combined in the smallest and lightest possible aircraft capable of housing the power plant and pilot, together with such essential equipment as fuel and armament.

It is well-known that it is impossible to incorporate optimum values for all these qualities in one and the same design: thus, high horizontal speed and high rate of climb necessarily imply differences in wing loading if optimum values are to be reached with a given power plant. At very high altitudes an increase in aspect ratio is beneficial, whilst manœuvrability generally goes with a small wing span.

Till quite recently, horizontal speed was given primary consideration. Every increase in output of power plant was utilized for this purpose, and the relatively poor rate of climb was accepted as a necessary price. Wing loadings were pushed to the limit rendering take-off and landing relatively difficult.

With the advent of the high altitude bomber, the need for a higher rate of climb for the fighter has become urgent, combats are taking place at ever-increasing altitude, and the aircraft with the higher ceiling has a very important advantage.

Whilst before everything was sacrificed for speed at relatively low altitudes, modern fighter design calls for a very careful compromise, unless, as is sometimes suggested, two separate fighter designs are developed.

The author has investigated this problem very fully and concludes that with careful design, optimum rate of climb and ceiling can be achieved for only a relatively small sacrifice in maximum horizontal speed, amounting to about 27 km./h. and 54 km./h. at supercharged heights of 6,000 m. and 12,000 m. respectively. On the other hand, the more lightly loaded aircraft has the advantage of 1,700 m. in ceiling and 3.7 m./sec. in rate of climb. As a matter of fact, the sacrifice in horizontal speed is likely to be less than 54 km./h. since the calculation neglects compressibility effects. (Such effects will be more pronounced for the heavily-loaded aircraft flying at the greater incidence.)

It is thus clear that for operation between 6,000 and 12,000 metres, the fighter should be designed primarily for maximum rate of climb, and its wing loading should not exceed about 150 kg./m.^{2}

Adequate strength of the structure is of primary importance, since compressibility effects may produce sudden changes in load distribution, especially during a high-speed dive. This may not only reduce the efficacy of the control surfaces, but may actually lead to destruction of the wing. Several fatal accidents are attributed to this effect.

Modern physiological research has shown that under suitable conditions the pilot can withstand for a short period accelerations in excess of those corresponding to the standard load factors.

There is thus every inducement to increase the strength characteristics of modern designs and thus also allow for high-speed compressibility effects.

In conclusion, the author makes a plea for restricting the weight of equipment to the utmost. At 10,000 metres an increase of 1 per cent. in the dead weight of the aircraft will reduce its ceiling by about 65 m., whilst an increase of 1 per cent. in the h.p. will increase the ceiling by only 43 m.

Unfortunately, the high-altitude operation necessitates extra equipment such as oxygen for the pilot and heating for the guns. The power plant also becomes heavier, due to increased size of the supercharger and airscrew.

The problem calls for considerable ingenuity on the part of the designer and considerably more research on the flying qualities of aircraft at high altitudes is required, before the element of "luck" can be considered as ruled out in the final compromise solution.

A Close-up of the LAGG-3 Russian Fighter. (N. Hulten, Flyg och Motor, Vol. 21, No. 6-7, March-April, 1943, pp. 21-24, 25-27.) (Available as R.T.P. Translation No. 1,822.) (112/2 Sweden.)

This single-seater fighter has the wings, fuselage and tail plane made of wood. Rudder, aileron and elevator are made of light alloys and fabric covered, the wing flaps consisting of dural sheet. Dural sheeting also covers the fore part of the fuselage.

The following are the main characteristics:—

Length	9.0 m.
Span	9.7 m.
Wing area	17.5 m.^{2}
Weight empty	2,620 Kg.
Weight full	3,200 Kg.
Fuel capacity	550 litres
Wing loading	183 Kg./m.^{2}

The engine is a liquid-cooled 12-cylinder V, of 36 litre stroke volume, employing a boost pressure of about 4 lb. and rated at 1,000 h.p. at 4,000 m. The dry weight is 575 kg. A three-bladed variable pitch propeller weighing 132 kg. is fitted.

The armament consists of a 20 mm. cannon (firing through the propeller axis and weighing 40 kg.) and two 12.7 mm. machine guns weighing 25 kg. each. The rate of fire of cannon and machine guns is the same, 700-800 rounds a minute.

The short wave wireless equipment deserves mention. Transmitter and receiver only weigh 4½ lb. each.

Details of the construction of the wing and fuselage are given. Both are provided with a plywood covering. The spar flanges are made of compacted wood, plywood being utilised for the webs.

According to Finnish pilots, the aircraft goes into a spin when a sharp turn is attempted. Elevator control has evidently given the designer some trouble in this machine, since a heavy pendulum (weight 12 kg., arm 50 cm.) is fitted above the tail wheel.

Of special interest are the fragmentation bombs weighing 25 kg. each. Provision is made for carrying up to six of these bombs below the wing.

These bombs are provided with rocket propulsion, providing an additional speed of about 250 m./sec. and enabling the bomb to penetrate 150 mm. of armour plate.

The Effect of Atmospheric Haze on the Camouflaging of Aerial Targets. (F. Lohle, Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 258-262.) (112/3 Germany.)

The author considers the case of an aircraft hangar surrounded by trees.

A_z = Albedo of camouflage paint.
A_u = ,, surrounding foliage.

The contrast K is given by

$$K=\left(\frac{(A_z-A_u)}{A_u}\right)$$ *i.e.*, per cent. incident light flux diffusively reflected.

Since A_u depends on the season and may vary from 6 per cent. (winter) to 16 per cent. (spring), whilst A_z is necessarily constant (assumed 8 per cent.), K will vary from 33 per cent. (winter) to -50 per cent. (spring).

(A negative value for K indicates that the surroundings are lighter than the target.)

In the presence of atmospheric haze, a virtual albedo A_D is superposed, with the result that the contrast is reduced to a near value $K_1=(A_z-A_u)/(A_u+A_D)$

$$=K\left(1-\frac{1}{\{1+A_u/A_D\}}\right) \quad . \quad . \quad . \quad . \quad . \qquad (1)$$
$$= \rightarrow 0 \text{ if } A_D \gg A_u.$$

The value of A_D will depend on the thickness of the layer of haze and its density distribution between target and observer (turbidity of atmosphere).

For low altitude reconnaissance (*i.e.*, observation from 300 m. looking obliquely ahead) only the ground density of the haze is effective which is directly related to the range of horizontal vision "S."

The following table gives A_D for three target distances D under these circumstances:—

TABLE 1.

	S	5	10	25	50	100 km.
A_D { D	1 km.	·54	·32	·14	·07	·04
	3 km.	·90	·69	·37	·21	·11
	10 km.	—	1.00	·79	·54	·32

For high altitude reconnaissance (view vertically downwards) A_D will depend on the height and density distribution of the haze.

Experiments have shown that the distribution is a function of the ground density and the type of weather, and since the ground density directly controls the range of horizontal vision near the ground it is again possible to tabulate A_D against S. This is done in the following table for two standard weather conditions for vertical vision from an altitude of 3,000 m.

TABLE 2.

S	5	10	25	50	100 km.
A_{D1}	·35	·25	·15	·09	·05
A_{D2}	.62	.42	.27	.18	.10

A_{D1} corresponds to particularly clear weather conditions (decreasing turbidity with altitude temperature inversion) whilst A_{D2} refers to bad weather with increasing turbidity and decreasing temperature with altitude.

A comparison of the two tables shows that A_D for 3,000 m. target distance is appreciably less for vertical than for oblique vision, with the result that the apparent contrast of a given target as calculated by equation (1) also differs in the two cases.

This is shown in the following table which gives K_1 as a function of S for a target distance of 3,000 m. $K=-.50$, $A_u=.16$.

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TABLE 3.

S		5	10	25	50	100 km.
K_1	(1)	−.08	−.10	−.15	−.22	−.30
	(2)	−.15	−.20	−.26	−.31	−.38
	(3)	−.10	−.13	−.18		

(1) Low altitude reconnaissance from 300 m., oblique via ahead.
(2) High altitude reconnaissance, decreasing turbidity } with altitude.
(3) High altitude reconnaissance, increasing turbidity } with altitude.

In the case of low altitude reconnaissance, the horizontal range of vision on the ground must be at least 25 km. to ensure contrast of −.15 between target and surroundings. In the case of vertical vision, however, for the same final contrast, the ground haze can be considerably denser with a range of vision as low as 5 km. if the upper air is clear due to temperature inversion.

The question naturally arises how far K must be reached before the threshold value of the eye is passed and the target merges into the background. This limiting value depends on the angular dimensions of the target and its surface brightness, as well as on the adaptation of the eye, which latter factor is affected by the oxygen concentration and atmospheric pressure. Relatively few experimental data are available on this subject and further research is urgently wanted.

Of special interest are threshold contrast values during night reconnaissance either by moonlight or when using flares. The author estimates that a million candle power flare at a height of 1 km. will produce a surface brightness of the target of the order of 10^{-1} apostilb ($=10^{-4}/(\pi \times 10^4)$ Hefner candles per cm.^{2}). This will produce a threshold value $K=.15$, *i.e.*, only contrasts in excess of this value will be noticed by the eye, provided the angular dimensions of the target are of the order of 1°.

For smaller targets, the threshold value rapidly increases and reaches about .4 for $1/6^\circ$.

If the surface brightness of the target is increased to 1 apostilb ($\simeq$ 10 million candle power flare) the threshold contrast value is approximately halved.

When illuminated by the full moon, threshold values of the order $K_1=.3$ may be expected.

Assuming the limiting value of $K_1=.15$ under flare illumination, Table 3 shows that high altitude (3,000 m.) reconnaissance will reveal the target even under bad weather conditions provided $S > 13$ km.

For low altitude reconnaissance S would have to be > 25 km. for the same target distance (3 km.). As a matter of fact, due to fore-shortening, the target will present a smaller angle than the 1° assumed above and for this reason the target must be approached to within less than 2 km. even if the ground haze is slight ($s=25$ km.). Generally speaking, it is thus easier to protect a target by camouflage against a low flying than against a high flying aircraft.

The author finally touches on the great difficulties produced by shadows when camouflaging targets. Such shadows may multiply the contrast by about 1,000 and render recognition almost infallible unless special precautions in the geometrical shape of the target are adopted. Here again a sub-division of the target into smaller units sub-tending the minimum angle at the place of the observer is recommended.

A Comparison of Direct and Alternating Current Supply in Aircraft on the Basis of Danger of Electrocution. (H. H. Viehmann, Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 268-269.) (112/4 Germany.)

At the present time, most electrical supply systems on aircraft employ direct current, the voltage varying between 22 and 29 volts, depending on the state of charge of the accumulator battery.

As the electric power consumption is continuously increasing, the question naturally arises whether a change over to higher DC or AC voltage might not be profitable. The author considers the case entirely from the point of view of danger of electrocution and gives an interesting review of the physiological aspects of the problem.

The electrical resistance of the human body is of the order of 1,000 ohm., but contact resistance at the skin may easily treble this value.

The danger to life depends on the amount of current passing through the muscles (especially those of the heart) and on whether the current is continuous or alternating. Continuous current is very much less dangerous and there is no evidence that a voltage below 140 v. has ever proved fatal even if the contact resistance is negligible. Under similar conditions, however, alternating voltages can be fatal if they exceed 35 volt.

Change in frequency of the alternations over the range 50 to 2,000 cycles/sec. does not appear to affect the danger appreciably whilst there is some evidence that an increase in frequency above 2,000 cycles/sec. reduces the risk. It has also been proved that heavy alternating currents exceeding $2\frac{1}{2}$ to 3 A. are not fatal unless prolonged over one minute. Loss of consciousness however results, accompanied by severe burns at the skin. Currents of this order, produced by an AC voltage of 2,500 were originally employed by the American authorities in the electrocution of criminals. In the modern method, such currents are employed only for a few seconds to produce unconsciousness, after which the current is lowered to .25 A. (250 volts) when death results immediately by paralysis of the heart muscles, the high voltage previously applied having perforated the skin and thus removed the contact resistance.

If absolute safety from accidental electrocution is thus to be avoided in aircraft, the supply voltages must be kept below 140 DC and 35 AC respectively.

The author is, however, of the opinion that if necessary, voltage of the order of 180 DC and 42 AC could be employed with reasonable security.

The Rôle of Composite Aircraft in Comparison with Other Methods of Assisted Take-off. (W. Hoff, German Academy of Aeronautical Research, Report No. 1, 1942, pp. 1-35.) (112/5 Germany.)

The author briefly reviews possible methods for facilitating take-off of heavily loaded high-speed aircraft, beginning with design features inherent in the craft (high lift flaps, variable pitch propellers, low drag undercarriage).

Such features by themselves will not suffice and take-off runs of the order of 2,000 m. are not uncommon. This necessarily restricts the employment of such aircraft to specially selected fields. Numerous proposals have been put forward to overcome this difficulty. Inclined runways would be of great help but their dependence on prevailing wind conditions scarcely justifies the expense. Catapult starts date from the time of the Brothers Wright, but their design became very cumbersome when applied to machines weighing more than about 25 tons. The catapult constitutes essentially a moving platform of relatively short travel and must therefore operate with considerable acceleration. It has been proposed to attach the platform to a separate motorised vehicle which has sufficient engine power to accelerate to the necessary speed over a distance corresponding to the available take-off run. By employing a wide track and wheels of large diameter, sufficient stability can be assured even if the ground is not in first class condition. This scheme appears to have been worked out in detail in Germany, but it is not known whether it has actually been tried. The aircraft could be mounted on the platform with its undercarriage already retracted and this should prove very beneficial. Other possible schemes, such as tow rope starts with a winch on the ground or by employing an aircraft tug are also discussed. Considerable experience has been gained with these methods in the case of gliders. It is doubtful, however, whether they are feasible for really large machines.

Assisted take-off by means of auxiliary power plants such as rockets is mentioned, but no details are given.

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The author then returns to the case of the moving platform starts and suggests that the employment of a second aircraft for this purpose instead of a ground vehicle would present certain advantages, the chief one being that the launching can take place at a safe altitude and closer to the target. Two possible solutions present themselves, depending on whether the aircraft to be launched is fixed above or below the aircraft serving as a carrier. Both schemes are investigated theoretically in some detail, the aircraft to be launched having the following characterestics:—

Weight	...	...	33.5 tons
Wing area	...	...	93 m.^{2}
Horse-power	...	...	5,000
Wing loading	...	...	360 kg./m.^{2}

Designed as a conventional monoplane, this machine would have a take-off run of about 2,000 m.

Various sizes of the mother aircraft are considered as will appear from the following table in which schemes (1) and (2) refer to the launched aircraft being above the parent, whilst (3) and (4) refer to the alternative position. A constant force of 1,675 kg. at separation of the two aircraft is assumed in each case:—

	Above.		Below.	
	1	2	3	4
Weight (tons)	22	11	33.5	17
Wing area (m.^{2})	186	186	233	233
Wing load kg./m.^{2} ...	120	60	144	72
H.P.	5,000	1,250	7,500	1,250
Min. theoretical take-off (m.) of combination ...	460	570	490	550

It will be noted that under the assumed condition of a constant separating force, there is no very marked difference in the length of take-off runs, although the h.p. and weight of the carrier aircraft have been changed over wide limits.

The beneficial results of this method of launching are obvious, the original 2,000 m. having been cut down to 500-600 m.

Of special interest is the fact that the h.p. of the carrier can be cut down considerably without affecting the results provided the wing loading of the carrier is sufficiently low. This naturally suggests building the carrier in the form of an auxiliary wing attached to the other aircraft without any additional power plant. The lunching in this case would correspond to shedding this auxiliary wing.

The scheme with parent below the launched aircraft has been tried out in practice by Mayo. In this case a parent aircraft of more or less orthodox design, but suitably strengthened, can be employed. The attachment has to be carried out by means of a crane.

In the alternative scheme (parent above), the parent aircraft must be provided with a sufficiently high undercarriage that it can "step over" the second aircraft whilst the attachment is carried out on the ground. A crane will not be required but the design of the parent will require careful consideration. On the other hand this method of launching will present the important advantage of operating with greater safety at a lower dynamic pressure, since the launched aircraft can dive immediately after separation and thus gain in speed.

In the discussion following this lecture, the value of composite aircraft as a means of assisted take-off was queried, especially for weights in excess of the order of 30 tons such as are considered by the author. A more profitable line of development was considered to be the design of power plants capable of standing up to a 50 per cent. overload with safety during the take-off and subsequent climb (at least 30 minutes). Under such conditions, a take-off of the order of 1,200 m. should generally be possible for a 45-ton machine, and this can be cut down to well below 1,000 m. by the provision of efficient rockets. Methods of take-off worthy of consideration must envisage the possibility of having to be applied to the large aircraft of the future ($\sim$ 100 tons) for which the composite method of launching will scarcely be feasible.

Some Experiments on the Increase in the Maximum Lift of an Aerofoil Undergoing a Change of Incidence at a Constant Angular Velocity. (N. Scheubel, German Academy of Aeronautical Research, Report No. 1, 1942, pp. 37-45.) (112/6 Germany.)

The maximum lift of an aerofoil is limited by the onset of separation of the flow. Now this phenomenon takes a certain time to develop, and if, during this period the incidence is still further increased, a higher lift corresponding to a greater incidence can be established for a short period. This phenomenon is of importance in connection with wing stressing in gusty weather and may also account for some of the high lift values occasionally observed during take-off and landing.

The effect of wing rotation on maximum lift was investigated experimentally by Kramer (Z.F.M., Vol. 23, pp. 185-189) as long ago as 1932, using a model aerofoil and a rotating wind stream, the lift force being recorded piezo-electrically. The increase in maximum lift coefficient varied practically linearly with angular speed, being represented by the equation

$$\Delta C_{L\max} = 21\ (d\alpha/dt)/(l/v)$$

where α = angle of incidence in radians.
l = chord of aerofoil.
v = wind speed.

The experiments covered the range $(d\alpha/dt)(l/v)$ varying from 4×10^{-3} to 30×10^{-3}, corresponding to rates of change of α from 50 to 400°/sec.

The largest increase in the maximum lift coefficient observed was of the order of .7 units for an average Reynolds number of 250,000.

In 1937, attention was called to the same phenomena in N.A.C.A. Report No. 618 in connection with experiments on a small civil aircraft in the N.A.C.A. full-scale tunnel. A similar linear relationship between ΔC_L and angular velocity was found, the rate of increase being, however, considerably greater, *i.e.*,

$$\Delta C_{L\max} = 370\ (d\alpha/dt)\ (l/v).$$

On the other hand, in these experiments, $(d\alpha/dt)(l/v)$ only ranges from 0 to $.2 \times 10^{-3}$, so that the maximum rate of change of α was only of the order of .17°/sec. corresponding to an increase in the maximum lift coefficient of about .08.

In these experiments Re was of the order of 3×10^6. The large difference in the proportionality factor (nearly 20 to 1) in these two sets of experiments suggested further experiments covering the range of "reduced" angular velocities $(d\alpha/dt)(l/v)$ from 0 to 2.5×10^{-3} not previously investigated.

For this purpose the author carried out model experiments on a wing of 7 cm. chord, but unlike Kramer's tests in which the air stream was deflected whilst the wing was fixed, the model wing was suddenly deflected in a steady air stream, the lift being again recorded piezo-electrically.

Over the lower speed range (reduced angular velocity 0 to $.2 \times 10^{-3}$) the results were in satisfactory agreement with the American full-scale tests, showing a similar large rate of increase in $C_{L\max}$.

At higher speeds (reduced angular velocity $.6 \times 10^{-3}$ to 2×10^{-3}) the lower rate of increase shown by Kramer's tests was reproduced. Between $(d\alpha/dt)(l/v) = .2 \times 10^{-3}$ and $.6 \times 10^{-3}$ there occurs a transition region characterised by a steady drop in the proportionality factor.

The Reynolds number in these experiments was of the same order as that in Kramer's tests. ($Re = \sim 200{,}000$.)

It is proposed to repeat these experiments at higher Reynolds number and investigate whether the position of the transition region for the reduced angular velocity is sensitive to the profile shape. In the discussion following the author's lecture, Prandtl expressed surprise at the large effects produced by relatively slow rates of change of α. Whilst the effect of high angular velocities can be satisfactorily explained by the inertia lag of separation of flow, the marked low speed effects, if confirmed, suggest change in the boundary layer characteristics. This phenomenon would probably be best investigated in the smoke tunnel.

The Activated Throw. (A. Proll, German Academy of Aeronautical Research, Report No. 1, 1942, pp. 47-62.) (112/7 Germany.)

The author defines as activated throw the projection of a mass at a high initial speed (e.g. by means of a catapult) and its subsequent motion when subjected to further acceleration by propulsive agencies attached to the body or to retardation under the influence of air forces.

The motion is considered to be determined essentially by the initial throw, the activations (i.e. propulsion or retardation) constituting a disturbance which is superposed on this fundamental trajectory.

Examples of such " activated " motions are furnished by:—

1. The early stages of the motions of an aircraft catapulted at an angle inclined to the horizontal.

2. The ejection of torpedoes from aircraft by means of an explosive charge.

3. The early stages of the motion of rockets released by catapult or fired from a mine thrower.

4. The motion of bombs released from aircraft and fitted with inherent propelling devices.

A strictly accurate solution for motions of this type is very difficult and approximations have generally to be introduced at some stage of the work.

The author suggests an alternative method in which the approximations are introduced at the start of the investigation. Depending on the nature of the problem, either the acceleration, velocity or distance are expressed as time functions which are suitably chosen to reproduce the general characteristics of the process and satisfy the boundary conditions. If, as is generally the case, we are only interested in the motion over a relatively short time, relatively simple expressions for the time functions can be obtained and the resulting expressions can be integrated without difficulty. (These simple time functions really represent the first term of the accurate series solution.) The author illustrates the method by means of two worked-out examples:—

(*a*) Inclined catapult start of an aircraft.
(*b*) Projectile trajectory subjected to air drag (high angle fire).

In the latter case, the results are in satisfactory agreement with those obtained by the standard methods, the labour involved, however, being considerably less.

The catapulted aircraft has the following characteristics:—

Weight	10 ton.
Wing loading	100 kg./m.^{2}
H.P.	3,500
Take-off speed	40 m./sec.

The catapult has a slope of 1 in 4 and the length of run is 20 m. The altitude of the launching point is thus 5 m. above ground. Assuming a launching speed of 30 m./sec. (acceleration 2.4 g. acting for 1.28 sec.), the aircraft will at first climb to an altitude of 9 m. at a horizontal distance of 34 m. During the subsequent drop in altitude, the speed will increase till take-off conditions ($v=40$ m./sec.) are reached at a distance of 126 m. from the launching point, the aircraft being thus at an altitude of 1 m. from the ground. Horizontal launching on the ground for the same length of catapult (20 m.) would require an acceleration of 4 g. acting for 1 sec.

It is interesting to note that the required launching speed diminishes rapidly with altitude of launching point. At an altitude of about 30 m., the initial launching speed would diminish to zero, i.e., the aircraft, if raised to the altitude by a lift and released, would gain the necessary take-off speed before it touched the ground.

Whilst such an altitude may not prove feasible in practice, the author suggests that a horizontal catapult, placed at an altitude of about 8 m. may be worthy of consideration.

Determination of the Lowest Natural Bending Frequency of Axial Flow Compressor Blades. (M. Schilhansl, German Academy of Aeronautical Research, Report No. 1, 1942, pp. 63-95.) (112/8 Germany.)

When designing an axial fan, the number of blades to be fitted is at first indeterminate, theory only indicating the total blade area required.

It is easily shown that for geometrically similar solid blades of the same length L, the hub stresses will be reduced if a large number of narrow blades are fitted. From the point of view of fan weight therefore, this arrangement should be adopted were it not for the fact that the narrower blades have a lower natural frequency and the danger of resonance with external disturbances is thus increased.

If the fan is used for a wind tunnel, disturbances occurring twice per revolution are not uncommon (effect of model wake) and the natural blade frequency (vibrations/minute) should therefore be above $2 \times$ r.p.m. at the maximum speed of operation.

The determination of the blade frequency in any special case is thus of importance. The effect of rotation is to produce an additional restoring force and the frequency of vibration is thus higher than when the fan is stationary. The connection between the two frequencies is given by

$$\lambda^2 = \lambda_0^2 + \phi\omega^2$$

where λ = circular bending frequency when rotating.
ω = angular velocity.
λ_0 = circular bending frequency with fan stationary.

Several methods for calculating λ_0 or λ are available, differing in relative accuracy and mathematical labour involved. Since obtaining λ_0 is generally much less laborious, the author suggests that this should first be carried out, the speed effect being allowed for separately by using an approximate expression for ϕ.

For this purpose, the author replaces the blade by a five-mass system and expresses the variation of the moment of inertia J along the radius by a power series in x (x = distance of section from a point situated halfway between hub and blade tip). Since a check calculation employing 10 masses produced only a negligible effect on λ_0, it is concluded that a five-mass distribution at $x/L = \pm .8$, $\pm .4$ and O will generally suffice (L = blade length).

For ϕ the approximate expression $\phi = 1 + r_i (S/K)$ is suggested, where
r_i = distance of blade root from centre of hub.
S and K = static and inertia moments respectively of complete blade about root.

S/K will, in general, lie between the limits $1.5/L$ (cylindrical rod) and $2/L$ (linear diminution of cross-section to zero value at tip).

Representative cases worked out by the author gave $S/K = 1.75$ and 1.54 respectively.

This expression for ϕ has been checked by carrying out the laborious determination of λ either by the Liebers or the Grammel method. Both these methods assume a deflection line satisfying the boundary conditions. By Rayleigh's principle, the true deflection line corresponds to a minimum value for the natural frequency and this forms the basis of Liebers' method. Grammel's method is still more laborious, but of greater accuracy, a step by step integration being carried out with the help of certain auxiliary functions.

Since a change in blade design has only a relatively small effect on ϕ, the problem is to make λ_0 as large as possible.

It can be shown that for a given blade, λ_0^2 varies as

$$\left\{\frac{(EJ_0)}{(F_0L^4)}\right\}\left(\frac{g}{\gamma}\right)$$

where E = Young's modulus.
γ = density.
J_0 = max. moment of inertia of section.
F_0 = max. area of section.
L = blade length.

If we increase the number of blades z whilst maintaining L and total blade area constant, the blade width B will decrease. Now for geometrically similar sections, J_0 is proportional to B^4 whilst F varies as B^2. λ_0^2 will thus vary as B^2, *i.e.*, vary inversely as the number of blades z. High frequency thus means few blades, but, as already pointed out, this leads to an increase in the hub stresses.

A change of blade material may alter the ratio E/γ on which λ_0 depends. Representative values are given below:—

Wood	1.67×10^8 cm.
Electron	2.50×10^8 ,,
Dural	2.59×10^8 ,,
Steel	2.68×10^8 ,,

For the same blade form, therefore, the three metals give about the same blade frequency, whilst that of wood is appreciably lower.

All the considerations so far have been based on solid sections.

If, however, hollow sections are considered, the ratio J/F, on which λ_0^2 depends, can be increased materially without change in blade size.

Thus for a solid circular section

$$J=\frac{\pi d^4}{64},\quad F=\frac{\pi d^2}{4},\quad J/F=\frac{d^2}{16}$$

For a thin circular ring we have of wall thickness s

$$J=\pi d^3 s/8$$

$$F=\pi ds \text{ and } J/F=d^2/8.$$

A change over to the hollow section will thus increase λ by about 40 per cent.

In the case of rectangular sections, the corresponding increase is 70 per cent.

For a normal blade, therefore, an increase in bending frequency by about 50 per cent. can be expected by a change over from solid to hollow construction.

The Gussolite Process for the Low Temperature Welding of Cast Iron. (Welding Industry, Vol. 2, No. 5, June, 1934, pp. 163-165.) (112/9 Germany.)

Normal cast iron welding using silicated rods and flux has to be carried out at a temperature of about 1,300°C. and unless the process is carried out with considerable skill there is grave danger of the joint cracking during cooling after welding.

For this reason, so-called " bronze welding " is frequently adopted in which the cast iron parts are bonded by a layer of bronze, this necessitating only a temperature of about 900°C. The process is easy to work and there is practically no damage of subsequent cracking.

The bonding is, however, not very strong and due to the marked difference in thermal expansion of bronze and cast iron, bronze welded parts cannot be subjected to appreciable temperature cycles.

In the gussolite process, a special welding rod is employed, which melts at about 850°C. and penetrates deeply into the solid cast iron previously treated with a special paste. The principal difference in the technique required for this process and ordinary cast iron welding is that the blow pipe is held as flat as possible, since the present metal does not require to be melted. Examples of repairs carried out by the gussolite process are described and illustrated. (Cylinder block, milling machine arm, guide rail on milling machine bedplate.)

It is claimed that the process has been approved by the Charlottenburgh Laboratory for testing Machine Tools.

No details on the composition of the rod and flux are given.

Note.—The gussolite process has lately been supplied to the reclamation of bomb components—see Machinery. July 2nd, 1942.

The Behaviour of Certain Structural Materials in the Tropics. (A.T.Z., Vol. 44, No. 12, 25/6/41, pp. 316-317.) (Translation No. 1,807.) (112/10 Germany.)

The article is mainly concerned with the electrical equipment of motor cars. The main difficulties appear to be due to moisture and dust. Sudden changes in temperature and atmospheric pressure in a tropical climate (hot and moist) may produce condensation of water in the interior of starters and generators even if the latter have been sealed against dust. The only remedy is the provision of proper ventilation, care being taken that the breather is fitted with an efficient dust filter. Even under these conditions starters and generators should be dismantled at frequent intervals and all traces of rust and mould removed. The same need for proper drainage and ventilation also applies to any internal parts of the car, if corrosion is to be minimised.

The use of tungsten as a contact material for relays, make and break, etc., in German equipment is likely to give trouble due to the formation of non-conducting film, if the car is laid up for any time. All such contacts should be cleaned before attempting to start up.

The storage of spares also requires considerable attention. Even if the parts are stable under tropical conditions, proper ventilation of the store must be provided. This applies especially to rubber. Unstable parts must be sealed up in tins after having been previously dried. It is most important to check such soldered tins periodically for leaks by immersing the tin in hot water (air bubbles !).

All bright iron parts must be protected with anti-rust oil. The same applies to electron, even if the material has already been subjected to anti-corrosion treatment. Die castings containing zinc should be avoided, but aluminium die castings, apart from suffering loss in appearance, are generally stable under tropical conditions.

In the case of soft rubber, only types definitely marked as stable must be used in the tropics.

Insulating tape containing linseed oil is unsuitable as it becomes sticky when hot. Only tape treated with natural asphalt should be used.

All fibre parts must be greased, and possible dimensional changes allowed for in its installation.

The same applies to laminated resin bushes using a fabric filler.

All leather parts must be greased to prevent mould.

The author is particularly insistent in the care and maintenance of transport vehicles being in skilled hands.

In the tropics, unskilled maintenance work is likely to do considerable harm.

Bending Fatigue Strength of Machined Crankshafts after Straightening, with Notes on the Stress Distribution Obtained by Extensometer and X-Ray Measurements. (R. Schmidt, Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 263-267.) (112/11 Germany.)

Forged crankshafts are subject to distortion after machining due to release of internal stresses. Subsequent straightening is usually carried out in a hydraulic press, the load being applied at the journal showing maximum deflection and the shaft supported symmetrically at two other journals. Under these conditions a certain amount of plastic deformation takes place in the hollow chamfer forming the transition between crank pin or journal and web, leading to an inherent stress distribution in this locality which may reach considerable values and thus affect the bending fatigue strength of the throw. In order to elucidate this problem, the author carried out fatigue tests on twin throw crankshafts provided with a central and two end journals (central section of a six throw shaft). The shafts were made of heat treated steel with low Ni content conforming to German Flw. specification 1460.5 with an ultimate tensile of about 130 kg./mm.^{2} (83 tons per sq. in.), journal diameter 86 mm., pin diameter 78 mm., web thickness 19 mm., chamfer radius 5 mm.

The fatigue tests were carried out by supporting the shaft vertically from one end journal and applying a cyclic bending moment to the other end. The method of support was such as to ensure a constant bending moment over the shaft length at any instant, the cyclic variation being produced by a rotating out of balance mass, operating at 1,700 r.p.m., the whole system being just below resonance. The bending of the shaft was recorded optically and served as a measure of the moment applied, making use of a static calibration. The shafts were tested as received and after deformation in a hydraulic press, the centre bearing being deflected by amounts varying from .1 to .5 mm. with respect to the end journals.

In their original state, the shafts had a fatigue limit of ± 200 mkg., the final fracture occurring indiscriminately at one or other of the crank pin/web fillets. This cracking was clearly indicated by a sudden drop in the frequency of the system. Deformation in the press by the amounts indicated above reduced the fatigue strength by about 20 per cent. and the endurance limit at 50,000 cycles by 33 per cent. In this case cracks only developed in the two crank pin/web fillets adjacent to the central web, *i.e.*, in the regions which had been plastically deformed during the bending process. It is interesting to note that all the observations fall on one Wöhler curve, irrespective of the amount of original deformation. This seems to indicate that the inherent stresses set up by plastic deformation and thus producing a preloading of the shaft tend to a limit as the deflection is increased.

Before investigating this matter further, the author investigated the stress distribution in the crank pin/web and journal/web chamfer as well as across the web under elastic deformation corresponding to a bending moment at 130 mkg.

The extensions were measured by means of an optical extensometer of the Martens type with a base length of 1.5 mm. carried in a special frame enabling readings to be taken in any azimuth, including the chamfer region. Attention was specially paid to a line coinciding with the ultimate fatigue crack across the web and crankpin/web chamfer. For each measuring point on this line both principal extensions were recorded, i.e. maximum extension at right angles and lateral extension along the line. From these extensions the principal stresses σ_1 and σ_2 were calculated as well as the plane surface stress

$$\sigma_g = \sqrt{\sigma_1{}^2 - \sigma_1\sigma_2 + \sigma_2{}^2}$$

which serves as a measure of the amount of deformation work. The results show that σ_g agrees very nearly with $\epsilon_{max} . E$, when ϵ_{max} = maximum extension in chamfer region and E = Young's modulus of material. Under the condition of these experiments therefore, the maximum extension is a measure of the bending load in the chamfer region of the shaft.

The results show that σ_g reaches a maximum value of app. 40 kg./mm.^{2} in this region, whilst the stress at the edge of the web is only about 10 kg./mm.^{2}

The nominal stress in the web for this particular bending moment (130 mkg.) is 14.8 kg./mm.^{2} and the form factor is thus of the order of three for this particular design.

Such a large stress concentration when the shaft is still deformed elastically must necessarily give rise to equivalent inherent stresses in the chamfered region when the shaft is bent plastically.

The presence of these stresses was confirmed by X-ray diffraction, making use of the Glocker method of stress analysis.

The photographs show maximum inherent stresses in the chamfer region of the order of 66 kg./mm.^{2} after the shaft had been deformed plastically so as to produce a deflection of .05 mm. of the central journal with respect to the shaft ends.

From fatigue investigations made on the crankshaft material, it appears that a preloading of the order of 66 kg./mm.^{2} should reduce the fatigue strength by about 40 per cent. This, of course, assumes that the induced plastic stresses maintain their original value during the fatigue period. Since the actual shafts after plastic deformation only showed a reduction of 20 per cent. in the fatigue strength, it appears probable that the inherent plastic stresses originally present will tend to equalise with fatigue time and this was confirmed by repeating the X-ray investigation on the deformed shaft after it had undergone 500,000 stress cycles. The inherent stresses now amounted to only 50 per cent. of the original value and would ultimately only cause a reduction in the fatigue strength by 20 per cent.

This is in satisfactory agreement with the experimental values and thus definitely proves that the inherent stresses due to plastic deformations are responsible for the drop.

The larger percentage reduction in the endurance of the deformed shaft are thus also accounted for. During the relatively short life under increased load (50,000 cycles) the inherent plastic stresses did not have time for equalisation.

It thus appears that the method of straightening a shaft in a press is definitely injurious to the material and should not be adopted.

As an alternative the author recommends carrying out the straightening process by hammering the sides of the web facing the crankpin. This causes a distortion of the web of the requisite amount without introducing inherent stresses in the chamfered region.

The absence of such stresses after deformation by this method was confirmed by X-ray diffraction measurements and such shafts when tested under fatigue gave identical results with those for undeformed shafts.

The hammering can be carried out neatly with a compressed air tool, using a very flat head (20 mm. radius), and this method of straightening is strongly recommended as it does not injure the material.

Strength Characteristic of Some Wooden Structural Elements Taken from Captured Russian Aircraft. (J. Theiner, Luftwissen, Vol. 10, No. 4, April, 1943, pp. 103-104.) (112/12 Germany.)

The elements tested were taken from three types of single-seat Russian fighters: LAGG-3, MIG-3 and JAK-1.

The former is built entirely of wood whilst the other two are of a mixed construction.

All three machines have a cruising speed of about 450 km./h. and a maximum speed of the order of 600 km./h.

The wing loading of the JAK-1 is rather low; 155 kg./m^2, that of the two other types about 185 kg./m.^{2}

The tests covered the wing structures of all three types. In the case of the MIG-3, the fuselage cover was also investigated.

The wing spans of the LAGG-3 and MIG-3 were made of beech (plywood or compressed veneers), the ribs and stringers of spruce.

The spar flanges of the JAK-1 are composed of numerous individual slats of spruce which are glued together. The shell fuselage of this aircraft is built up by criss-cross glueing of strips of veneer, each .5 mm. thick and 200 mm. wide, the number of superimposed layers depending on the thickness required.

The strength characteristics of the various samples are given tabular form and are stated by the author to fall mainly within the range of the values laid down in the German strength specification.

The values obtained for the LAGG-3 are, however, much higher and are considered exceptionally good. This is illustrated in the following table for compacted beech consisting of 13 layers of veneer, each 3 mm. thick and treated with phenol formaldehyde resin.

Ultimate tensile (average) ...	2,500 kg./cm.^{2}	($E=326\times10^3$ kg./cm.^{2})
Density	1.34 gr./cm.^{3}	
Max. compression strength average value parallel to layer in direction of longitudinal fibre	2,100 kg./cm.^{2}	
Max. bending strength average value perpendicular to layer	2,900 kg./cm.^{2}	($E=300\times10^3$ kg./cm.^{2})

The density of this compacted wood is about double that of ordinary ply, whilst its tensile strength is increased nearly three times.

The Experimental Determination of the Blade Temperature of Gas Turbines Under Load. (T. Benzinger, Luftwissen, Vol. 10, No. 4, April, 1943, pp. 110-113.) (112/13 Germany.)

In the usual determination of blade temperature, a thermocouple is used, the current being led off by means of slip rings. In order to rule out variations in contact resistance, a null method must be employed. Instead of utilising a separate circuit for this purpose, the author employs the neat alternative of worming up the rotating cold junction by enclosing it in an electric heating coil and recording the compensation temperature by means of an ordinary mercury thermometer.

The slip rings were made of copper, the brushes consisting of a copper wire working in conjunction with a graphite block which provides the necessary lubrication. It is stated that the wear is very small and has worked satisfactorily at speeds up to 24,000 r.p.m.

Since, up to now, contacts of this type have always been under a certain amount of suspicion when operating at such high speeds, an alternative method of transmitting the EMF by induction and without slip rings was developed. In this case, the current induced in a secondary coil surrounding the rotating leads is further amplified by means of a resistance/capacity valve circuit and finally recorded by means of a cathode ray oscillograph. Development of this instrument proved very troublesome at first due to eddy currents induced by the earth's magnetic field and remanence of the shaft ball-bearings. This was finally overcome by employing a rotor made of plastic and adopting an efficient metal shield against the ball-bearing effects.

The results obtained with this alternative method of transmission are in satisfactory agreement with those obtained with slip rings and the simpler method can therefore be used without fear of serious error for tests of this type.

It is, however, conceivable that the more complicated induction transmission will be necessary if the experimental lay-out is such that very high rubbing speeds at the contacts cannot be avoided.

The article gives some examples of exhaust turbine blade temperatures obtained by this method. The turbine utilised air cooling of the blades by means of interposed nozzles.

For an exhaust temperature of 825°C. in front of the nozzle, temperatures at the leading edge varied from 450°C. (front of blade) to 520°C. (halfway to top). These results were obtained at 2,400 r.p.m. At 15,000 r.p.m., these values increased from 500°C. to 580°C. respectively due to the reduced cooling effect.

The Scientific Basis for Height Tolerance Tests by Means of Breathing Definite Gas Mixtures. (Th. Benzinger, Luftfahrtmedizin, Vol. 6, No. 2-3, pp. 234-253, April, 1942.) (112/14 Germany.)

The decompression chamber is generally employed to assess flying fitness at high altitude and as a means of training altitude fliers to recognise symptoms of altitude sickness which come on unbeknown to the pilot and, if not dealt with immediately, may lead to serious injuries. The forbidding cost of such apparatus and the need to cope with increasing numbers of trainees have prompted the authors of this paper to investigate the possibilities of using simpler methods for simulating altitude conditions. For this purpose a mixture of air and nitrogen is used, the pressure and oxygen content of this mixture being so adjusted as to correspond with conditions obtaining at any required altitude. The ordinary oxygen breathing apparatus or Douglas bag (with certain modifications in design to ensure maximum safety) may be used for administering the oxygen-nitrogen mixture.

In the present study, 300 fliers were tested in this manner at a simulated altitude of 8,000 m. The reactions of the subjects were carefully studied under such headings as general physical well-being, respiration, pulse rate, blood pressure and electro-cardiogram.

Of interest was the fact that out of 300 subjects tested only 10 disclosed serious circulatory disturbances, nine of whom showed a clearly defined symptomology manifested by a sudden drop in the heart rate, decrease in blood pressure, pallor of skin and, prior to loss of consciousness, a return to normal electrocardiogram. The authors advance the theory that this complex of symptoms may be attributed to the excitation of the vogus nerve.

Parachute Descent and Time-Reserve at Great Heights. (O. Gauer and others, Luftfahrtmedizin, Vol. 6, No. 4, July, 1942, pp. 340-355.) (112/15 Germany.)

Altitudes above 10,000 m. have now become actual zones of operation. The problem of parachute descents from such heights is thus of vital importance. From previous investigations it has been found that the interruption of oxygen supply at an average altitude of 7,000 m. may lead to serious consequences. Four significant stages in the physiological effects of altitude have been noted :—

1. The reaction threshold at approximately 2,000-3,000 m.
2. The disturbance threshold at 4,000-5,000 m.
3. The critical threshold at roughly 6,000-8,000 m.

and finally

4. The lethal threshold which is function of time after the critical threshold has been passed.

This paper deals specifically with the two intermediate stages—the disturbance and critical thresholds. The latter is reached when the subject is incapable of writing and shows rapid decline of muscular control.

On the basis of tests carried out in the decompression chamber it has been shown that when the oxygen supply is interrupted, the time-reserve at 7,000 m. is approximately 5 min., at 8,000 m. $2\frac{1}{2}$ min., at 9,000 m. $1\frac{1}{2}$ min., and at 10,000 m. almost 1 min., and at 12,000 m. approximately 30 sec. How far these time-reserve values will apply when the altitude level is continuously changing as in the case of parachute descent is the subject of this paper.

Diagrams and tables are given showing the times of fall with and without parachute opening from altitudes ranging from 12,000-6,000 m., and the time-reserve available before efficiency becomes impaired. In these tests the descents with open parachute were simulated in the decompression chamber with the subjects at rest in the sitting position and at room temperature.

It is shown that 9,000 m. is a critical height for parachute descent from aircraft. Above this height serious symptoms of anoxia occur, particularly at altitudes above 10,000 m., when loss of consciousness and even death may occur. Almost complete recovery from anoxic symptoms occurred on reaching an altitude level of 7,000 m. The dangers of anoxia when making descents from an altitude of 10,000 m. may be considerably reduced by taking deep breaths of oxygen immediately before descent and holding the breath. The possibility of adopting this procedure when making descents from high altitudes is not considered practicable owing to the danger of even slight anoxia, disabling the pilot from pulling the rip-cord.

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SUPERSONICS.

1776	Sauer, R. ...	... *Geometrical Relationship Between Two-Dimensional Fields of Compressible Flow.* (Z.A.M.M., Vol. 21, No. 5, October, 1941, pp. 312-315.)
1778	Guderley, G.	... *Powerful Spherical and Cylindrical Compression Shocks in the Neighbourhood of the Centre of the Sphere and of the Cylinder Axis.* (L.F.F., Vol. 19, No. 9, 20/10/42, pp. 302-312.)

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1769	Kovalev, J. A.	... *High Altitude Aircraft.* (Civil Av., U.S.S.R., Vol. 8, No. 6, June, 1938, pp. 39-41.)
1771	Streltxov, V. V.	... *Stratosphere Flying.* (Civil Av., U.S.S.R., Vol. 9, No. 3, March, 1939, pp. 17-18.)
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1767	Fredenhagen, K. ... Tramitz, E. ...	*Problems and Development of a Theory of Binary Systems.* (Koll. Zeit., Vol. 99, No. 1, 1/4/42, pp. 52-73.)
1768	Fredenhagen, K. ... Tramitz, E. ...	*Do all Systems Approach Raoults' Law with Increasing Dilutions?* (Koll. Zeit., Vol. 99, No. 3, June, 1942, pp. 283-290.)
1772	Wiegard, H. ...	*Effect of Surface Treatment on Fatigue Strength.* (Handbook published by B.M.W., Flugmotorenbau, 1940.)
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14	9337	U.S.A.	*Training Military Technicians.* (S. G. Henry, J.S.A.E., Vol. 51, No. 3, March, 1943, pp. 17-22.)
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41	9477	G.B.	*A Westland Wapiti of the Indian Air Force for Target Towing (Photograph).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 444.)
42	9582	G.B.	*Britain's Newest Spitfire (Photograph).* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, p. 82.)
43	9607	G.B.	*Hurricane 11D Tank Buster (Photograph).* (Aeroplane, Vol. 64, No. 1,665, p. 467, 23/4/43.)
44	9610	G.B.	*Squadron of Supermarine Spitfire VBS on Portable Runways (Photograph).* (Aeroplane, Vol. 64, No. 1,665, p. 469, 23/4/43.)
45	9613	G.B./ Germany ...	*Whitworth Whitley V and Arado Ar. 196 As. in Combat (Photograph).* (Aeroplane, Vol. 64, No. 1,665, p. 474, 23/4/43.)
46	9616	G.B.	*Armstrong Whitworth Whitley V (Recog. Details).* (Aeroplane, Vol. 64, No. 1,665, p. 481, 23/4/43.)
47	9704	G.B.	*The Avro-Lancaster.* (M. W. Bourdon, Autom. Ind., Vol. 87, No. 6, 15/9/42, pp. 18-19.)

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48	9740	U.S.A./G.B.	*Lockheed "Lightning" and British "Spitfire" (Photo).* (Canadian Aviation, Vol. 151, No. 8, Aug., 1942, p. 40.)
49	9760	G.B.	*Avro Lancaster I (Sectional Drawing).* (Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 30-31.)
			Military Types of Aircraft (American).
50	8982	U.S.A. ...	*The New Martin "Mariner" (Photograph).* (U.S. Air Services, Vol. 28, No. 1, Jan., 1943, p. 30.)
51	9141	U.S.A. ...	*The Grumman Avenger (Photo).* (Flight, Vol. 43, No. 1,790, 15/4/43, p. 392.)
52	9143	U.S.A. ...	*Curtiss Owl (Recognition Details).* (Flight, Vol. 43, No. 1,790, 15/4/43, p. b.)
53	9156	U.S.A. ...	*American Aeroplanes in Service—X (Recognition Details).* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, p. 459.)
54	9159	U.S.A. ...	*Douglas Dakota (Douglas D.C. 3) (Recognition Details).* (Flight, Vol. 43, No. 1,789, 8/4/43, p. A.)
55	9174	U.S.A. ...	*The Curtiss P-40—The Warhawk (Recognition Details).* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, pp. 422-423.)
56	9187	U.S.A. ...	*The Barracuda.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 32.)
57	9205	U.S.A. ...	*North American B-25.* (Trade Winds, Feb., 1943, pp. 6-7.)
58	9216	U.S.A. ...	*Martin Mariner P.B.M.-3 (Photograph)* (Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, p. 54.)
59	9217	U.S.A. ...	*Consolidated P.B. 27-2 "Coronado" (Photograph).* (Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, p. 54.)
60	9218	U.S.A. ...	*New Single-Seat Fighter—Corsair (F4U) (Photograph).* (Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, p. 58.)
61	9355	U.S.A. ...	*Boeing 17F Flying Fortress.* (Aero Digest, Vol. 42, No. 2, p. 155, Feb., 1943.)
62	9430	U.S.A. ...	*Lockheed P. 38.* (Aviation, Vol. 42, No. 1, pp. 101, 369, Jan., 1943.)
63	9470	U.S.A. ...	*Martin Marauder (B. 26) (Photograph).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 435.)
64	9471	U.S.A. ...	*Vultee Vigilant Taking Off (Photograph).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 437.)
65	9472	U.S.A. ...	*North American Mustang (P-51) (Photograph).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 438.)
66	9544	U.S.A. ...	*Martin Marauder (Photo).* (Flight, Vol. 43, No. 1,786, 18/3/43, p. 273.)
67	9545	U.S.A. ...	*North American B-25 (Mitchell).* (Flight, Vol. 43, No. 1,786, 18/3/43, p. 275.)
68	9552	U.S.A. ...	*Vought Sikorsky "Corsair" (Recog. Details).* (Flight, Vol. 43, No. 1,786, 18/3/43, p. a.)
69	9555	U.S.A. ...	*U.S. Army's Helldiver (A-25).* (Flight, Vol. 43, No. 1,786, 18/3/43, p. 286.)

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70	9559	U.S.A.	...	*Vega Ventura Bomber.* (Engineer, Vol. 175, No. 4,555, 30/4/43, p. 341.)
71	9590	U.S.A.	...	*The Grumman TBF-1 Releasing Torpedo (Photograph).* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, p. 116.)
72	9600	U.S.A.	...	*Lockheed Lightnings Fly to Britain.* (Flight, Vol. 43, No. 1,791, 22/4/43, p. 423.)
73	9606	U.S.A.	...	*North American A-36 (Photo).* (Aeroplane, Vol. 64, No. 1,665, p. 466, 23/4/43.)
74	9614	U.S.A.	...	*American Aeroplanes in Service—XI (Drawings).* (Aeroplane, Vol. 64, No. 1,665, p. 475, 23/4/43.)
75	9628	U.S.A.	...	*Identification Table of American Military Aircraft.* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 265.)
76	9639	U.S.A.	...	*American Aeroplanes in Service—VI (Recog. Details).* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 278.)
77	9670	U.S.A.	...	*Formation of Lockheed Lightnings (Photograph).* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 250.)
78	9687	U.S.A.	...	*Vought-Sikorsky F4U-1 Corsair (Photo).* (Flight, Vol. 43, No. 1,791, p. 408, 22/4/43.)
79	9689	U.S.A.	...	*Sikorsky Helicopter for Landing or picking up Men in Enemy Territory (Photo).* (Flight, Vol. 43, No. 1,791, 22/4/43, p. 412.)
80	9692	U.S.A.	...	*Taylorcraft Auster (L-57) (Recog. Details).* (Flight, Vol. 43, No. 1,791, 22/4/43, p. a.)
81	9693	U.S.A.	...	*Vultee "Vigilant" (O-49A) (Recog. Details).* (Flight, Vol. 43, No. 1,791, 22/4/43, p. b.)
82	9744	U.S.A.	...	*Flying Fortress in U.S. Army Air Forces (Photo).* (Canadian Aviation, Vol. 15, No. 8, Aug., 1942, p. 94.)

Military Types of Aircraft (Russian).

83	9149	U.S.S.R.	...	*Russian IL-2 Stormovik Laying a Smoke Screen (Photo).* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, p. 441.)
84	9546	U.S.S.R.	...	*P.E. 2 and Stormovik.* (Flight, Vol. 43, No. 1,786, 18/3/43, pp. 276-277.)

Military Types of Aircraft (German).

85	8997	Germany	...	*A Test Flight on Arado 196 (Float Plane).* (R. Otte, Motor Schau, Vol. 7, No. 1, Jan., 1942, pp. 26-27.)
86	9142	Germany	...	*Focke-Wulf F.W. 189 (Recognition Details).* (Flight, Vol. 43, No. 1,790, 15/4/43, p. A.)
87	9165	Germany	...	*Arado 196 Reconnaissance Seaplane Catapulted from German Cruiser (Photograph).* (Flight, Vol. 43, No. 1,789, 8/4/43, p. 375.)
88	9168	Germany	...	*Messerschmitt Me. 109F (Photo).* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 411.)
89	9191	Germany	...	*New German Aircraft.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 36.)
90	9202	Germany	...	*F.W. 190 A-3.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 36.)

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91	9626	Germany ...	*Photographs of German Aircraft in the Air.* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 263.)
92	9631	Germany ...	*Captured Me. 109F (Photograph).* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 269.)
93	9669	Germany ...	*A New Messerschmitt?* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 250.)
94	9677	Germany ...	*Blohm and Voss BV. 222 Six-Engined Flying Boat (Recognition Details).* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 260.)
95	9709	Germany ...	*Focke-Wulf F.W. 190 (with Photos).* (M. W. Bourdon, Autom. Ind., Vol. 87, No. 6, 15/9/42, pp. 34-35.)
			Military Types of Aircraft (Japanese).
96	9227	Japan ...	*Japanese Aircraft and Their Crews.* (Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 100-103.)
97	9722	Japan ...	*Japanese Fighters.* (Aeronautics, Vol. 8, No. 3, April, 1943, p. 33.)
			Military Types of Aircraft (Italian).
98	9160	Italy	*Caproni Ca. 313 (Recognition Details).* (Flight, Vol. 43, No. 1,789, 8/4/43, p. B.)
99	9163	Italy	*Savoia-Marchetti S.M. 84 Carrying Torpedo (Photograph).* (Flight, Vol. 43, No. 1,789, 8/4/43, p. 368.)
100	9668	Italy	*Burnt Out Caproni Ca. 311 Light Bombers (Photograph).* (Aeroplane, Flight, Vol. 43, No. 1,785, 11/3/43, p. 248.)
101	9676	Italy	*Piaggio P. 108 Bombers (Photograph).* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 257.)
			Military Types of Aircraft (French).
102	9603	France ...	*New French Aircraft.* (Flight, Vol. 43, No. 1,791, 22/4/43, p. 418.)
103	9713	France ...	*The Potez 161.* (Autom. Ind. Vol. 87, No. 6, 15/9/42, pp. 48 and 68.)
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104	8977	U.S.A. ...	*New Type of Asbestos Fabric.* (Am. Av., Vol. 6, No. 18, 15/2/43, p. 37.)
105	9005	G.B.	*Captured British Aircraft Material (Photograph).* (Luftwelt, Vol. 10, No. 4, 15/2/43, pp. 72-73.)
106	9127	U.S.A. ...	*Birdproof Windshield.* (Ind. and Eng. Chem., Vol. 21, No. 4, 25/2/43, p. 276.)
107	9155	U.S.A. ...	*Lockheed Hydraulic Systems.* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, p. 453.)
108	9444	U.S.A. ...	*Wing Slot of Me. 109 (Design Detail).* (Aviation, Vol. 42, No. 1, p. 171, Jan., 1943.)
109	9551	Germany ...	*H.E. III New Cockpit Arrangement (Photo).* (Flight, Vol. 43, No. 1,786, p. 284.)
110	9557	G.B.	*Spitfire Seat of Laminated Plastics (German Commentary).* (Flight, Vol. 43, No. 1,786, 18/3/43, pp. 291-292.)
111	9625	G.B.	*The Fighter Bomber.* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 263.)

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112	9671	G.B. ...	... *Fighters and Fighter Bombers.* (F. A. de V. Robertson, Flight, Vol. 43, No. 1,785, 11/3/43, pp. 252-256.)
113	9699	U.S.A.	... *The Development of Impact Resisting Windshields.* (A. L. Morse, S.A.E. Nat. Aeronautics Meeting, March 12-13, 1942.)
114	9723	G.B. ...	... *Twin-Engine Fighters.* (Aeronautics, Vol. 8, No. 3, April, 1943, pp. 36-42.)
115	9767	U.S.A.	... *Plans for Bomber Transport Capable of Carrying 400 Passengers.* (Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 48 and 58.)
			Armament (Guns, Turrets, Field Artillery).
116	9089	G.B. ...	... *The Bristol Power-Operated Gun Turret.* (L. G. Frise, Engineer, Vol. 175, No. 4,553, 16/4/43, pp. 312-314.)
117	9154	G.B. ...	... *Bristol Gun Turrets.* (L. G. Frise, Aeroplane, Vol. 64, No. 1,664, 16/4/43, pp. 450-452.)
118	9169	U.S.A.	... *Gunner's Pillbox of Consolidated P.B.Y. Flying Boat (Photo).* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 412.)
119	9245	U.S.A.	... *Aircraft Armament.* (N. W. Ellis, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 189-191 and 256.)
120	9368	U.S.A.	... *Hydraulic Machine Gun Chargers.* (S. I. Macduff and G. A. Goeffrich, Aero Digest, Vol. 42, No. 2, pp. 243-244, 278-282, 350, Feb., 1943.)
121	9554	G.B. ...	... *Mg. 131 for Bombers and Fighter Bombers.* (Flight, Vol. 43, No. 1,786, 18/3/43, pp. 285-286.)
122	9583	U.S.A.	... *New American Gun Turret.* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, p. 82.)
123	9609	G.B. ...	... *Short Sunderland II with Dorsal Two-Gun Turret (Photo).* (Aeroplane, Vol. 64, No. 1,665, p. 468, 23/4/43.)
124	9647	Germany	... *The German 7.92 mm. Machine Gun Mg. 34.* (M. F. Medlin, Army Ordnance, Vol. 24, No. 137, March-Apr., 1943, pp. 324-327.)
125	9720	Germany	... *Me. 210 Remote Control Guns.* (Aeronautics, Vol. 8, No. 3, April, 1943, p. 27.)
126	9733	Germany	... *British Reports on German Aeroplanes—VIII. The Focke-Wulf F.W. 190. (Details of Aircraft Armament and B.M.W. 801 D Engine.)* (Airc. Eng., Vol. 15, No. 169, March, 1943, pp. 76-81.)
127	9752	U.S.A.	... *American Gun Turrets (Photos).* (Autom. Ind., Vol. 87, No. 11, 1/12/42, pp. 42-43.)
128	9642	U.S.A.	... *Standardised Inspection.* (R. G. Saunders, Army Ordnance, Vol. 24, No. 137, March-Apr., 1943, pp. 290-292.)
129	9643	U.S.A.	... *Maintenance and Supply Functions in the Field.* (H. J. Conway, Army Ordnance, Vol. 24, No. 137, March-Apr., 1943, p. 301.)
130	9644	U.S.A.	... *Self-Propelled Artillery.* (Army Ordnance, Vol. 24, No. 137, March-Apr., 1943, pp. 293-300.)

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131	9652	U.S.A.	...	*Artillery To-Day (including Photographs of Recent German Types).* (H. Rowan-Robinson, Army Ordnance, Vol. 24, No. 136, Jan.-Feb., 1943, pp. 73-76.)
				Ballistics, Bombs, etc.
132	9189	G.B. ...	...	*Firing Backwards.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 34.)
133	9291	Germany	...	*Angular Measurements in Ballistics.* (K. Gey, Introduction to Ballistics, 1937, pp. 64-65.)
134	9726	G.B. ...	...	*The Pursuit Effect.* (B. H. Rabineau, Aeronautics, Vol. 8, No. 3, April, 1943, pp. 50-57.)
135	9128	U.S.A.	...	*Chemical Smoke Screens.* (Ind. and Eng. Chem., Vol. 21, 25/2/43, p. 277.)
136	9645	U.S.A.	...	*Toluene for Japan's Explosives.* (B. O. Lisle, Army Ordnance, Vol. 24, No. 137, March-Apr., 1943, p. 304.)
137	9728	U.S.S.R.	...	*Russian Aircraft Equipped with Flame-Throwers.* (Aeronautics, Vol. 8, No. 3, April, 1943, p. 68.)
				Naval Air Arm.
138	9235	U.S.A.	...	*Aerology in U.S. Naval Air Arm.* (H. T. Orville, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 140-142 and 288 and 294.)
139	9233	U.S.A.	...	*Naval Aviation's Ground Crews.* (Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 129-130 and 300.)
140	9232	U.S.A.	...	*U.S. Navy's Air Transport.* (C. H. Schildhauer, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 127-128 and 236-238.)
141	9231	U.S.A.	...	*U.S. Navy Coast Guard Aviation.* (Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 114-116 and 236-238.)
142	9220	U.S.A.	...	*Survey of U.S. Naval Air Battles Since the War.* (Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, pp. 72-76 and 192, 199-202.)
143	9214	Canada	...	*The Navy's Air Arm.* (Frank Knox, Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, pp. 47 and 286.)
144	9241	U.S.A.	...	*Technicians in the U.S. Naval Air Arm.* (F. Tupper, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 174-177.)
145	9630	U.S.A.	...	*Grumman Martlets as Naval Fighters (Photograph).* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 268.)
146	9226	U.S.A.	...	*U.S. Navy Torpedo Bombers.* (D. E. Wilcox, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 98-99.)
147	9225	U.S.A.	...	*Patrol Bombers in U.S. Navy.* (T. R. Frederick, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 92-96 and 297.)
148	9224	U.S.A.	...	*Scout Observation Planes in U.S. Navy.* (M. K. Fleming, Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, pp. 89-90.)

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149	9222	U.S.A. ...	*U.S. Naval Fighter Aircraft.* (J. S. Thach, Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, pp. 82-84 and 244.)
150	9223	U.S.A. ...	*U.S. Naval Scout Bombers.* (I. L. Kimes, Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, pp. 86-88 and 280.)
151	9219	U.S.A. ...	*U.S. Naval Aircraft (Photographs).* (Flying and Pop. Aviation. Vol. 32, No. 2, Feb., 1943, pp. 51-71.)
152	9605	U.S.A. ...	*Lockheed Vega PBV-1 Ventura of the U.S. Navy (Photo).* (Aeroplane, Vol. 64, No. 1,665, p. 464, 23/4/43.)
153	9553	U.S.A. ...	*U.S. Navy Helldiver S.B.2C-1 (Recog. Details).* (Flight, Vol. 43, No. 1,786, 18/3/43, p. b.)
154	9731	U.S.A. ...	*The Grumman Tarpon T.F.B. 1 (Avenger), New Fleet Air Arm Types (Recog. Details).* (Airc. Eng., Vol. 15, No. 169, March, 1943, pp. 64 and 69.)
155	9629	G.B.	*Supermarine Seafire on Aircraft Carrier (Photograph).* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 267.)
156	9221	U.S.A. ...	*U.S. Aircraft Carriers.* (F. C. Sherman, Flying and Pop. Aviation, Vol. 32, No. 2, Feb., 1943, pp. 78-80 and 229-230.)
157	9484	G.B.	*Aircraft Carrier H.M.S. Indomitable on Active Service (Photographs).* (Flight, Vol. 43, No. 1,792, 29/4/43, pp. 446-447.)
158	9243	U.S.A. ...	*U.S. Navy's Non-Rigid Airships.* (T. G. W. Settle, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 184, 266 and 272.)
159	9229	U.S.A. ...	*Gliders and Gliding in the U.S. Navy.* (J. Wehle, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 109-110 and 283.)
			Troop Transport.
160	9147	France ...	*S.E. 200 Six-Motor Flying Boat (Photo).* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, p. 438.)
161	9148	U.S.A. ...	*The Douglas C-47 as an Ambulance.* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, p. 439.)
162	9150	Germany ...	*Ju. 52/3 m. Transports Flying Over Mediterranean (Photo).* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, p. 440.)
163	9578	U.S.A. ...	*Lockheed "Constellation" (Photograph).* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, p. 43.)
164	9627	U.S.A. ...	*Lockheed C-69 Constellation Four-Motor Transport (Photograph).* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 265.)
165	9634	G.B.	*De Havilland Albatross (Photograph).* (Aeroplane, Vol. 64, 1,658, 5/3/43, p. 272.)
166	9636	U.S.A. and China ...	*Douglas C-53 Transport in China (Photograph).* (Aeroplane, Vol. 64. No. 1,658, 5/3/43, p. 273.)
167	9640	U.S.A. ...	*Curtiss C-76 Caravan Two-Motor Transport (Photograph).* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 284.)

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168	9650	U.S.A. ...	*The New Curtiss Caravan Army Transport.* (Army Ordnance, Vol. 24, No. 137, March-April, 1943, pp. 334-335.)
169	9673	G.B.	*De Havilland Albatross (Recognition Details).* (Flight, Vol. 43, No. 1,785, 11/3/43, p. a.)
170	9678	Germany ...	*Messerschmitt ME. 323 Transport Monoplane.* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 260.)
171	9729	Germany ...	*Junkers 90 Four-Engined Troop Carrier (Photograph).* (Aeronautics, Vol. 8, No. 3, April, 1943, p. 68.)
172	8983	U.S.A. ...	*The Curtiss C-76 "Caravan" (Photograph).* (U.S. Air Services, Vol. 28, No. 1, Jan., 1943, p. 36.)
			Trainers.
173	8984	U.S.A. ...	*Fairchild Plastic Plywood Trainer AT-14 (Photograph).* (U.S. Air Services, Vol. 28, No. 1, Jan., 1943, p. 40.)
174	9186	G.B.	*Miles M.28.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 32.)
175	9478	G.B.	*Miles M.28 (Recognition Details).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. a.)
176	9479	U.S.A. ...	*Piper L-59A (Recognition Details).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. b.)
177	9550	U.S.A. ...	*Lockheed AT-18 (Trainer Version of Hudson).* (Flight, Vol. 43, No. 1,786, 18/3/43, p. 283.)
178	9589	U.S.A. ..	*The Lockheed AT-18 Trainer (Photograph).* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, p. 112.)
179	9641	G.B.	*Oxford II Trainer (Photograph).* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 279.)
180	9690	Canada ...	*The New Cornell Trainer (Recog. Details).* (Flight, Vol. 43, No. 1,791, pp. 413-416, 22/4/43.)
181	9716	U.S.A. ...	*Beechcraft Bomber-Pilot Trainer (Wood Construction) (Photo).* (Autom. Ind., Vol. 87, No. 6, 15/9/42, p. 54.)
182	9718	U.S.A. ...	*Ryan Plywood Trainer (Photo).* (Autom. Ind., Vol. 87, No. 6, 15/9/43, p. 56.)
183	9725	G.B.	*Miles M-28 (Recog. Details).* (Aeronautics, Vol. 8, No. 3, April, 1943, p. 46.)
184	9746	U.S.A. ...	*Fairchild Cornell Trainer (Photo).* (Canadian Aviation, Vol. 15, No. 8, Aug., 1942, p. 89.)
185	9779	U.S.A. ...	*PT-25 Plywood Trainer is Tested.* (Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 48.)
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186	9010	Italy	*Italian Glider Canguro CVV. 6.* (Flugsport, Vol. 35, No. 7, 31/3/43, pp. 77-78.)
187	9164	Denmark ...	*Danish Gliding.* (Flight, Vol. 43, No. 1,789, 8/4/43, p. 368.)
188	9170	U.S.A. ...	*American Aeroplanes, Training Gliders in Service, IX (Silhouettes).* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 415.)
189	9171	G.B.	*Handley Page H.P. 42 Air Speed Horsa (Photo).* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 416.)
190	9176	G.B.	*Miles Master II as a Tug for Hotspur Gliders (Photo).* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 424.)

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191	9488	U.S.A. ...	*CG4 Waco Glider Carrying Jeep (Photograph).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 456.)
192	9548	G.B. ...	*Glider Pick-up.* (Flight, Vol. 43, No. 1,786, 18/3/43, pp. 280-282.)
193	9556	Japan ...	*Japan's Gliders.* (Flight, Vol. 43, No. 1,786, 18/3/43, p. 289.)
194	9615	U.S.A. ...	*Gliders in the U.S.A.* (H. W. Perry, Aeroplane, Vol. 64, No. 1,665, pp. 476-477, 23/4/43.)
195	9617	G.B. ...	*Airspeed Horsa Glider (Recog. Details).* (Aeroplane, Vol. 64, No. 1,665, p. 481, 23/4/43.)
196	9717	U.S.A. ...	*Laister-Kauffman Training Glider (Photo).* (Autom. Ind., Vol. 87, No. 6, 15/9/43, p. 52.)
197	9741	U.S.A. ...	*Glider Pick-up (Photo).* (Canadian Aviation, Vol. 15, No. 8, Aug., 1942, p. 42.)
198	8974	U.S.A. ...	*Interior Photo of Waco 15 Place Glider.* (Am. Av., Vol. 6, No. 18, 15/2/43, p. 17.)
			Equipment.
199	9197	G.B. ...	*Fireproof Clothing.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 32.)
200	8976	U.S.A. ...	*Cable Tester (Photograph).* (Am. Av., Vol. 6, No. 18, 15/2/43, p. 36.)
201	8979	U.S.A. ...	*New Fire Extinguisher.* (Am. Av., Vol. 6, No. 18, 15/2/43, p. 37.)
202	9012	Germany ...	*Jettisoning Supplies from Aircraft. (Photographs Showing Containers in Position).* (Flugsport, Vol. 35, No. 7, 31/3/43, p. 83.)
203	9027	Germany ...	*Sea Anchor. (Pat. series No. 2* (730,942). (Arado, Flugsport, Vol. 35, No. 7, 31/3/43, p. 12.)
204	9228	U.S.A. ...	*U.S. Paratroops and Their Equipment.* (L. E. Marie, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 106-108 and 294.)
205	9244	U.S.A. ...	*Life-Saving Equipment.* (J. E. Sullivan, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 186-188 and 296.)
206	9356	U.S.A. ...	*New Type of Life-Saving Raft.* (Aero Digest, Vol. 42, No. 2,pp. 156, 350-351, Feb., 1943.)
207	9604	Germany ...	*New Lightweight Clothing Outfit for Luftwaffe Pilots.* (Flight, Vol. 43, No. 1,791, 22/4/43, p. 418.)
208	9611	U.S.A. ...	*Some Details of U.S. "Secret" Norden Bomb-sight.* (Aeroplane, Vol. 64, No. 1,665, p. 472, 23/4/43.)
209	9612	Germany ...	*New German Devices and Patents.* (Aeroplane, Vol. 64, No. 1,665, p. 474, 23/4/43.)
210	9691	Germany ...	*German Parachute Supply Containers (Photo).* (Flight, Vol. 43, No. 1,791, 22/4/43, p. 418.)
211	9762	U.S.A. ...	*D.C. Generators for Aircraft (Elec. Equipment).* (P. M. Heldt, Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 36-39.)

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			Anti-Aircraft and A.R.P.
212	8989	G.B. ...	... *Application of Small Diameter "Unbreakable" Syphon Systems to the Drainage of Trench Air-Raid Shelters and the Like.* (D. F. F. Brewster, J. Inst. Civil Engs., Vol. 20, No. 5, March, 1943, pp. 19-26.)
213	9139	G.B. ...	... *Water-Borne Balloons.* (N. D. Ryder, Flight, Vol. 43, No. 1,790, 15/4/43, pp. 383-386.)
214	9230	Canada	... *Barrage Balloons.* (B. L. Smith, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 111-113 and 298-299.)
215	9357	U.S.A.	... *Infra-Red Camouflage.* (L. E. Bowles, Aero Digest, Vol. 42, No. 2, pp. 159-162, 292-295, Feb., 1943.)
216	9369	U.S.A.	... *Protection Against War Chemicals (Chart).* (W. P. Burn, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 522 R.)
217	9481	Germany	... *"Flak Train" Adopted by the Germans (Photographs).* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 445.)
218	9654	U.S.A.	... 40 *mm. Bofors Anti-Aircraft Gun Redesigned from Riveted to Welded Construction.* (Army Ordnance, Vol. 24, No. 136, Jan.-Jeb., 1943, p. 115.)

Aerodynamics and Hydrodynamics.

219	9059	U.S.A.	... *Determination of Fuselage Moments (Digest).* (C. E. Pappas, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 72.)
225	9353	U.S.A.	... *Statistical Investigation of the V^2 Law for Lift.* (H. G. Smith, Aero Digest, Vol. 42, No. 2, pp. 144, 352-355, Feb., 1943.)
226	9473	U.S.A.	... *Prospective Construction of New Gust Tunnel at Langley Field.* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 438.)
227	9474	U.S.A.	... *N.A.C.A. Research Programme.* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 438.)
228	9511	G.B. ...	... *Roughness Factors in Fluid Motion Through Cylindrical Pipes and Through Open Channels.* (J. Allen, J. Inst. of Civil Engs., Vol. 20, No. 6, April, 1943, pp. 91-107.)
229	9569	G.B. ...	... *Breakwaters (contd.).* (R. R. Minikin, Engineering, Vol. 155, No. 4,033, 30/4/43, pp. 342-343.)
230	9730	G.B. ...	... *The Resistance of a Smooth Flat Plate with Turbulent Boundary Layer.* (W. M. Falkner, Airc. Eng., Vol. 15, No. 169, March, 1943, pp. 65-69.)

Aircraft, Airscrews and Accessories.

General (including Take-off).

231	9215	Canada	... *Bureau of Aeronautics.* (J. S. McCain, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, p. 50.)
232	9239	U.S.A.	... *The Catapult.* (J. A. Haley, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 167-168.)

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233	*9427	U.S.A.	...	*Technique to Shorten Take-offs and Landings.* (R. de H. Williams, Aviation, Vol. 42, No. 1, pp. 94-95, 313-319.)
234	*9429	U.S.A.	...	*Rocket Power for Assisted Take-off.* (R. Healy, Aviation, Vol. 42, No. 1, pp. 100, 221-223, Jan., 1943.)
235	9633	G.B. ...	...	*Bird Flight.* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 271.)
236	9680	G.B. ...	...	*Corrections Applied to Indicated Altitudes.* (C. Williams, Flight, Vol. 43, No. 1,785, 11/3/43. pp. 261-262.)
				Design and Construction.
237	9047	U.S.A.	...	*Aircraft Structural Testing (Digest).* (B. L. S. Pringer, J.S.A.E., Vol. 51, No. 2, Feb., 1943, pp. 72-73.)
238	9079	U.S.A.	...	*Non-Critical Materials for Airframe Construction (Digest).* (L. D. Bonham, J.S.A.E., Vol. 50, No. 11, Nov., 1942, p. 61.)
239	9144	G.B. ...	...	*Some Future Designs for Civil and Military Transports (Unorthodox Types).* (C. A. H. Pollit, J. H. Lover, Flight, Vol. 43, No. 1,790, 15/4/43, pp. 393-396.)
240	9151	G.B. ...	...	*New Aeroplane Designs.* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, p. 438.)
241	9158	G.B. ...	...	*Rotating Wing Aircraft—II.* (Flight, Vol. 43, No. 1,789, 8/4/43, pp. 359-364.)
242	9345	U.S.A.	...	*A.N.C.5 Strength of Aircraft Materials, Dec., 1942.* (Issued by the Army-Naval Civil Committee on Aircraft Design Criteria.)
243	9437	U.S.A.	...	*Design Considerations for Plywood Structures (Pt. III).* (L. J. Marhoefer, Aviation, Vol. 42, No. 1, pp. 150-153, 348-349, Jan., 1943.)
244	9596	G.B. ...	...	*Applications of Resilitex in Aircraft Upholstery.* (Air. Prod., Vol. 5, No. 55, May, 1943, p. 229.)
245	9715	U.S.A.	...	*Flying Fuselage, Desirable Aerodynamic Qualities.* (Autom. Ind., Vol. 87, No. 6, 15/9/42, p. 54.)
246	9742	Canada	...	*Glue in Modern Aircraft.* (J. G. MacDermott, Canadian Aviation, Vol. 15, No. 8, Aug., 1942, pp. 55-58, 80-84.)
247	9580	Canada	...	*Tricycle Landing Gears.* (Canadian Aviation, Vol. 16, No. 22, Feb., 1943, p. 78.)
248	9684	G.B. ...	...	*Advantage of the Castoring Nose Wheel.* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 265.)
249	9695	G.B. ...	...	*The Tricycle Undercarriage.* (Flight, Vol. 43, No. 1,791, 22/4/43, pp. 422-423.)
250	9098	G.B. ...	...	*The "Bristol" Hydraulic System for Aeroplanes.* (Engineering, No. 155, No. 4,030, 9/4/43, p. 294.)
251	9125	U.S.A.	...	*Cellulose Seals for Aeroplane Pipes.* (British Plastics, Vol. 14, No. 167, April, 1943, p. 666.)
252	9190	G.B. ...	...	*Aircraft Control Device.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 35.)
253	9485	G.B. ...	...	*Aileron Control.* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 448.) Abstract available.

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254	9246	U.S.A. ...	*New Plastic Fuel Tank.* (Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, p. 234.)
255	*9440	U.S.A. ...	*Detachable Fuel Tank of Moulded Plywood.* (Aviation, Vol. 42, No. 1, p. 163, Jan., 1943.)
256	9714	U.S.A. ...	*Streamlined Spare Fuel Tanks (Photo).* (Autom. Ind., Vol. 87, No. 6, 15/9/42, p. 50.)
			Civil and Experimental Aircraft Types.
257	9140	G.B.	*The Nuffield-Napier Heston Racer.* (Flight, Vol. 43, No. 1,790, 15/4/43, pp. 387-391.)
258	9153	G.B.	*The Napier Heston Racer.* (Aeroplane, Vol. 64, No. 1,664, 16/4/43, pp. 447-449.)
259	9167	G.B.	*Heston Racer (Photograph).* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 409.)
260	9584	Germany ...	*Civil Heinkel He. 274.* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, p. 82.)
261	9674	G.B.	*Armstrong Whitworth Ensign (Recog. Details).* (Flight, Vol. 43, No. 1,785, 11/3/43, p. b.)
262	9708	Italy	*Caproni-Campini CC - 2 Aircraft (Photograph).* (Autom. Ind., Vol. 87, No. 6, 15/9/42, p. 31.)
263	8991	G.B.	*Henson's "Aerial Steam Carriage," 1843.* (J. E. Hodgson, J. Roy. Aeron. Soc., Vol. 47, No. 388, April, 1943, pp. 118-128.)
			Air Cargo and Air Lines.
264	9073	U.S.A. ...	*Engineering Problems of Air Cargo Transportation.* (R. D. Kelly and W. W. Davies, J.S.A.E., Vol. 50, No. 11, Nov., 1942, pp. 492-498.)
265	9349	U.S.A. ...	*The Present Cargo Plane Situation.* (L. V. Spencer, Aero Digest, Vol. 42, No. 2, pp. 113-116, 351-352, Feb., 1943.)
266	9359	U.S.A. ...	*Aeroplane Design for Cargo Transport.* (C. Wood, Aero Digest, Vol. 42, No. 2, pp. 185-190, 219-250, Feb., 1943.)
267	9448	U.S.A. ...	*Who Should Carry Air Cargo?* (J. H. Frederick, Aviation, Vol. 42, No. 1, pp. 255-257, 344.)
268	9549	G.B.	*Stowing Air Freight (New Equipment).* (Flight, Vol. 43, No. 1,786, 18/3/43, pp. 282-283.)
269	9635	G.B.	*The Future of British Air Commerce.* (Aeroplane, Vol. 64, No. 1,658, 5/3/43, p. 272.)
270	9701	U.S.A. ...	*Engineering Problems Associated with Air Cargo Transportation.* (R. D. Kelly and W. W. Davies, S.A.E. Nat. Aeronautics Meeting, March, 1942.)
271	8610	U.S.A. ...	55 *Essential Airline Jobs Listed.* (Am. Av., Vol. 222, No. 10, 15/10/42, p. 26.)
272	8975	U.S.A. ...	*Air Transport Information Office Compiles Data for Post-War Lines.* (R. H. Wood, Am. Av., Vol. 6, No. 18, 15/2/43, pp. 24 and 48.)
273	9152	G.B.	*Operators of Air Transports.* (Sir Alan Cobham, Aeroplane, Vol. 64, No. 1,664, 16/4/43, pp. 445-446.)
274	9172	G.B.	*Possible Air Routes of the Future.* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, pp. 18-19.)
275	9178	G.B.	*Trans-Australia Service.* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 430.)

* Abstract available.

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276	9347	U.S.A. ...	*Expansion of Post-War Air Transportation.* (H. R. Stringer, Aero Digest, Vol. 42, No. 2, pp. 95-96, 296-303, Feb., 1943.)
277	9486	U.S.A. ...	*International Air Transport.* (A. Kunzler, Flight, Vol. 43, No. 1,792, 29/4/43, pp. 449-450.)
278	9577	Canada ...	*Canadian Pacific Air Lines (Symposium of Articles).* (Can. Av., Vol. 16, No. 2, Feb., 1943, pp. 45-70.)
279	9601	G.B.	*Trade and Air Transport.* (Flight, Vol. 43, No. 1,791, 22/4/43, p. 423.)
280	9637	G.B.	*Transports and Air Ports.* (J. P. Chaplin, Aeroplane, Vol. 64, No. 1,658, 5/3/43, pp. 274-275.)
281	9683	G.B.	*Report of the General Council of Shipping on Air and Sea Transport.* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 264.)
282	9764	U.S.A. ...	*Air vs. Rail and Water Transport.* (W. A. Patterson, Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 17-19 and 66-67.)
			Propellers and Fans.
283	9173	G.B.	*Saving Damaged Airscrews.* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, pp. 420-421.)
285	9365	U.S.A. ...	*Contra-Rotating Propellers.* (Aero Digest, Vol. 42, No. 2, pp. 228-231, Feb., 1943.)
286	9366	U.S.A. ...	*Wickwire Automatic V.P. Propeller.* (Aero Digest, Vol. 42, No. 2, pp. 231, 242, Feb., 1943.)
287	9443	U.S.A. ...	*New Hydraulic Dual Rotation Propeller (Hollow Steel Blades).* (Aviation, Vol. 42, No. 1, p. 165, Jan., 1943.)
288	9724	U.S.A. ...	*Wickwire Automatic V.P. Propeller.* (Aeronautics, Vol. 8, No. 3, April, 1943, p. 45.)
289	9754	G.B.	*New Rotol Propeller for Trainers.* (Autom. Ind., Vol. 87, No. 11, 1/12/43, p. 46.)
			Pressure Cabins.
290	9013	Germany ...	*Cut-outs in Pressure Cabins. (Pat. series No. 2, 731,810.)* (Junkers, Vol. 35, No. 7, 31/3/43, p. 5.)
291	9014	Germany ...	*Double Windows with Air Seal. (Pat. series No. 2, 731,688.)* (Junkkers, Flugsport, Vol. 35, No. 7, 31/3/43, p. 5.)
292	9058	U.S.A. ...	*Cabin Supercharging in Scheduled Airline Operation (Digest).* (R. L. Ellinger, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 72.)
293	9195	G.B.	*Pressure Chambers.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, pp. 31-32.)
			Patents.
294	9017	Germany ...	*Boundary Layer Control (Reduced Air Requirements). (Pat. series No. 2, 729,949.)* (Junkers, Flugsport, Vol. 35, No. 7, 31/3/43, p. 6.)
295	9018	Germany ...	*Prevention of Overload on Landing Flaps. (Pat. series No. 2, 731,545.)* (Dornier, Flugsport, Vol. 35, No. 7, 31/3/43, pp. 6-7.)
296	9019	Germany ...	*Automatic Pilot (Pat. series No. 2, 730,006.)* (Siemens, Flugsport, Vol. 35, No. 7, 31/3/43, p. 7.)

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297	9020	Germany ...	*Fowler Flap Modifications.* (*Pat. series No.* 2, 729,663.) (Heinkel, Flugsport, Vol. 35, No. 7, 31/3/43, pp. 7-8.)
298	9021	Germany ...	*Split Control Column* (*Two-Handed Type*). (*Pat. series No.* 2, 730,007.) (Junkers, Flugsport, Vol. 35, No. 7, 31/3/43, p. 8.)
299	9022	Germany ...	*Control Column Arranged Behind Pilot with Lateral Extensions for Hand Operations.* (*Pat. series No.* 2, 731,161.) (Henschel, Flugsport, Vol. 35, No. 7, 31/3/43, p. 8.)
300	9024	Germany ...	*Flanged Fitting for Aircraft Parts.* (*Pat. series No.* 2, 731,546.) (Arado, Flugsport, Vol. 35, No. 7, 31/3/43, p. 9.)
301	9025	Germany ...	*Boundary Layer Control for Seaplane Hulls.* (*Pat. series No.* 2, 729,950.) (Dornier, Flugsport, Vol. 35, No. 7, 31/3/43, p. 12.)
302	9026	Germany ...	*Automatic Coupling for Autogyros.* (*Pat. series No.* 2, 731,109.) (B.M.W., Flugsport, Vol. 35, No. 7, 31/3/43, pp. 9-10.)
303	9028	Germany ...	*Spring Leg with Fluid Damping.* (*Pat. series No.* 2, 731,592.) (Messerschmitt, Flugsport, Vol. 35, No. 7, 31/3/43, p. 10.)
304	9029	Germany ...	*Locking Device for Retractable Undercarriage.* (*Pat. series No.* 2, 731,592.) (Arado, Flugsport, Vol. 35, No. 7, 31/3/43, p. 11.)
305	9030	Germany ...	*Spring Leg for Tail Wheels.* (*Pat. series No.* 2, 720,540.) (Elektron, Flugsport, Vol. 35, No. 7, 31/3/43, p. 10.)
306	9031	Japan ...	*Collapsible Floats for Aircraft* (*Operated by Compressed Air*). (*Pat. series No.* 2, 731,378.) (T. Nakagawa, Flugsport, Vol. 35, No. 7, 31/3/43, p. 11.)
307	9071	Germany ...	*Retracted Undercarriage Suspension.* (*Pat. series No.* 2, 731,274.) (Arado, Flugsport, Vol. 35, No. 7, 31/3/43, pp. 10-11.)

Engines and Accessories.

Named Types.

308	8980	U.S.A. ...	*Lycoming New Flat Geared Engine* (*G.O.*-435). (Am. Av., Vol. 6, No. 18, 15/2/43, p. 44.)
309	9200	G.B. ...	*B.M.W.* 801 *A*-1 *Engine—Construction Details.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 35.)
310	9206	U.S.A. ...	*Some American Aircraft Powered by Cyclone Engines* (*Photographs*). (Trade Winds, Feb., 1943, pp. 10-11.)
311	9207	U.S.A. ...	*Cyclone* 2,600-*A Engine* (*Photograph*). (Trade Winds, Feb., 1943, pp. 10-11.)
312	9313	U.S.A. ...	1,000 *h.p. Diesel Electro-Motive Engine* (*Photograph*). (Nat. Pet. News, Vol. 35, No. 4, 27/1/43, p. 32.)
313	9469	G.B. ...	*Napier Sabre Sleeve-Valve* 24-*Cylinder Engine* (*Photograph*). (Flight, Vol. 43, No. 1,792, 29/4/43, p. 434.)

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314	9547	Germany ...	*Junkers Radial and Twin Daimler-Benz Engines.* (G. Smith, Flight, Vol. 43, No. 1,786, 18/3/43, p. 279.)
315	9655	Germany ...	*B.M.W. 801 A Developed from Pratt and Whitney 14-Cylinder Twin Wasp.* (Army Ordnance, Vol. 24, No. 136, Jan.-Feb., 1943, pp. 116-117.)
316	9679	Germany ...	*New Daimler Benz D.B. 606 (Double Engine Mounted Side by Side).* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 260.)
317	9749	U.S.A. ...	*Two-Stroke Diesel with Exhaust Turbo-Supercharger (Pt. II).* (J. W. Swisstunoff, Autom. Ind., Vol. 87, No. 11, 1/12/42, pp. 26-30.)
318	9759	G.B.	*Bristol Hercules 1,600 h.p. 14-Cylinder Power Plant (Drawing).* (Autom. Ind., Vol. 87, No. 12, 15/12/42, p. 29.)
319	9777	U.S.A. ...	*Diesel Engine Problems.* (Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 44, 76-80.)
			Design and Installation.
320	9009	G.B.	*Technical Abstracts issued by Aero Engine Dept., Bristol Aeroplane Co., Ltd.* (Vol. 8, No. 13, April 1, 1943.)
321	9054	U.S.A. ...	*Aviation Power Plants (Digest).* (S. A. Moss, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 69-70.)
322	9056	U.S.A. ...	*New Matenal for Aircraft Engines (Digest).* (M. H. Young, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 71.)
323	9057	U.S.A. ...	*Accessory Power for Aircraft (Digest).* (T. B. Holliday, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 71-72.)
324	9506	G.B.	*Precision Governing of Engines.* (Mech. World, Vol. 113, No. 2,937, 16/4/43, pp. 416-417.)
325	9585	Germany ...	*Installation of Engine in Rear of Aeroplane (Dornier Patent).* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, p. 82.)
326	9707	G.B.	*Jet Propulsion Developments.* (P. M. Heldt Autom. Ind., Vol. 87, No. 6, 15/9/42, pp. 30-33.)
327	9711	U.S.A. ...	*Decline of the Long-Stroke Engine.* (Autom. Ind., Vol. 87, No. 6, 15/9/42, p. 45.)
			Testing and Overhaul.
328	9048	U.S.A. ...	*Influence of Engine Adjustment and Octane Number on Performance of Commercial Vehicles (Digest).* (D. P. Brenz and others, J.S.A.E., Vol. 51, No. 2, Feb., 1943, Vol. 51, No. 2, Feb., 1943, p. 63.)
329	9055	U.S.A. ...	*Stress Determination in Engine Parts (Digest).* (C. Lipson, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 70-71.)
330	9201	G.B.	*New Engine Test Beds for Fuel Economy.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 35.)

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331	9364	U.S.A. ...	*Power Recovery System of Testing Aircraft Engines.* (G. E. Cassidy and others, Aero Digest, Vol. 42, No. 2, pp. 223-227, 268-271, Feb., 1943.)
332	9581	Canada ...	*Recovering Power from the Testing of Aeroplane Engines.* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, pp. 80-82.)
333	9592	G.B.	*Engine Testing (Rootes' New Test House).* (F. G. Sheffield, Airc. Prod., Vol. 5, No. 55, May, 1943, pp. 211-217.)
334	9702	U.S.A. ..	*Production Testing Facilities of Allison Division of General Motors.* (H. J. Buttner, S.A.E. National Aeronautics Meeting, March 1942.)
335	9758	U.S.A. ...	*Power Recovery in Testing Aircraft Engines.* (C. A. Chayne, Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 26-28, 84-85.)
336	9045	U.S.A. ...	*Reconditioning Cylinder Block and Fitting Sleeves.* (J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 49-51.)
337	9074	U.S.A. ...	*Limiting Factors of Overhaul Periods for Aircraft Engines.* (M. Whistlock, J.S.A.E., Vol. 50, No. 11, Nov., 1942, pp. 499-508.)
			Cold Starting.
338	9061	U.S.A. ...	*The Effect of Injection Pumps on Cold Starting of Diesels (Digest).* (M. M. Koensch, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 74.)
339	9062	U.S.A. ...	*Cranking Power and Torque Requirements of Diesels at Zero Temperature (Digest).* (H. L. Knudsen, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 74.)
340	9064	U.S.A. ...	*Cold Starting Tests on Diesel Engines (Digest).* (H. R. Porter, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 74.)
341	9067	U.S.A. ...	*The Importance of Accessory Equipment in Cold Starting of Diesels (Digest).* (F. C. Burk, J.S.A.E., Vol. 51, No. 2, Feb., 1943, p. 74.)
342	9068	U.S.A. ...	*Special Cold Starting Fuel for Diesel Engines (Digest).* (C. H. Cloud and L. M. Ferenzi, J.S.A.E., Vol. 51, No. 2, Feb., 1943, p. 75.)
343	9069	U.S.A. ...	*Practical Experience in Military Cold Starting (Digest).* (C. E. Cummings, J.S.A.E., Vol. 51, No. 2, Feb., 1943, p. 75.)
344	9331	G.B.	*General Requirements of A.C. Motor Starters—II.* (Mech. World, Vol. 113, No. 2,932, 12/3/43, p. 285.)
345	9343	U.S.A. ...	*The Importance of Accessory Equipment in Cold Starting of Diesel Engines.* (W. T. Pelizzonia, J.S.A.E., Vol. 51, No. 3, March, 1943, pp. 95-98.)
346	9508	G.B.	*Types of A.C. Motor Starters.* (Mech. World, Vol. 113, No. 2,937, 16/4/43, pp. 420-423.)
			Accessories (Air Filters, Piston Rings, etc.).
347	8978	U.S.A. ...	*Automatic Boost Control.* (Am. Av., Vol. 6, No. 18, 15/2/43, p. 37.)

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348	9072	U.S.A.	...	*The Elliott-Lysholm Supercharger (Digest).* (A. Lysholm, J.S.A.E., Vol. 51, No. 2, Feb., 1943, pp. 75-76.)
349	9039	U.S.A.	...	*Requirements for Carburettor Air Filters for Aero Engines.* (W. D. Cannon, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 33-37 and 63.)
350	9051	U.S.A.	...	*Piston Ring Scuffing as a Criterion of Oil Performance (Digest).* (G. H. Keller, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 64.)
351	9053	U.S.A.	...	*Carburettor for the Aircraft Engine (Digest).* (F. J. Wiegand, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 68-69.)
352	9076	U.S.A.	...	*Intercoolers and Their Performance in Aircraft (Digest).* (S. K. Anderson and P. A. Scherer, J.S.A.E., Vol. 50, No. 11, Nov., 1942, p. 60.)
353	9105	U.S.A.	...	*Relation of Shape to the Passage of Grains Through Sieves (Filters).* (G. Rittenhouse, Ind. and Eng. Chem. (Anal. Ed.), Vol. 15, No. 2, 15/2/43, pp. 153-155.)
				Turbines, Blowers, Pumps, etc.
354	9016	Germany	...	*Gas Turbine Drive for Boundary Layer Control. (Pat. series No. 2, 729,879.)* (Messerschmitt, Flugsport, Vol. 35, No. 7, 31/3/43, p. 6.)
355	9070	U.S.A.	...	*Hamilton-Whitfield Blower (Digest).* (J. E. Whitfield, J.S.A.E., Vol. 51, No. 2, Feb., 1943, p. 76.)
356	9095	G.B. ...	...	*The "Step Valve" Chemical and Proportioning Pumps.* (Engineering, Vol. 155, No. 4,030, 9/4/43, pp. 285-286.)
357	9097	G.B. ...	...	*The Heat Pump.* (J. R. Beard, Engineering, Vol. 155, No. 4,030, 9/4/43, p. 294.)
358	9099	G.B. ...	...	*Sims' Compound Pumping Engine.* (T. R. Harris, Engineering, Vol. 155, No. 4,030, 9/4/43, pp. 294-295.)
359	9304	G.B. ...	...	*The Heat Pump.* (Engineering, Vol. 155, No. 4,032, 23/4/43, p. 336.)
360	9323	G.B. ...	...	*Steam Machinery (Geared Turbines, Reciprocating Engines, The Meizer Heat Cycle).* (C. C. Pounder, Mech. World, Vol. 113, No. 2,935, 2/4/43, pp. 364-367.)
361	9332	G.B. ...	...	*Steam Generators (Contd.).* (C. C. Pounder, Mech. World, Vol. 113, No. 2,933, 19/3/43, pp. 297-299.)
362	9491	U.S.A.	...	*Rotary Pumps.* (R. J. Sweeney, J. Am. Soc. Nav. Eng., Vol. 55, No. 1, Feb., 1943, pp. 1/24.)
363	9516	G.B. ...	...	*The Production of Marine Turbine Units.* (Machinery, Vol. 62, No. 1,591, 8/4/43, pp. 374-378.)
364	9567	U.S.A.	...	*Large Forced Circulation Boiler.* (Engineer, Vol. 175, No. 4,555, 30/4/43, pp. 356-358.)
365	9661	G.B. ...	...	*Water-Tube Boiler Practice.* ((H. Pryce-Jones, J. Inst. Elect. Engs., Vol. 90, No. 26, Pt. 1, Feb., 1943, pp. 67-70.)

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			Knock, Icing, Oil Consumption.
366	9040	U.S.A. ...	*New Methods for Evaluation and Recording of Piston Skirt Deposits.* (H. R. Luck and others, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 38-44 and 63.)
367	9043	U.S.A. ...	*Control of Oil Consumption in High Speed Four-Cycle Automatic Diesel Engines (Digest).* (A. J. Stahl, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 64.)
368	9049	U.S.A. ...	*Effect of Altitude on Knock (Digest).* (D. B. Brook, J.S.A.E., Vol. 51, No. 2, Feb., 1943, p. 63.)
369	9103	U.S.A. ...	*Freezing Points, Densities and Refractive Indexes of the System Glyceral-Ethylene Glycol-Water.* (J. A. Spangler and E. C. H. Davies, Ind. and Eng. Chem (Anal. Ed.), Vol. 15, No. 2, 15/2/43, pp. 96-99.)
370	9732	G.B.	*Icing in Induction Systems.* (L. B. Kimball, Airc. Eng., Vol. 15, No. 169, March, 1943, pp. 70-75.)
			Fuels and Lubricants.
			General Developments.
371	9042	U.S.A. ...	*Development of the Co-operative Fuel Research Council.* (C. B. Veal, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 45-51 and 63-64.)
372	9318	Sweden ...	*The Fuel Position in Sweden.* (E. A. Bell, Pet. News, Vol. 47, No. 1,191, 20/3/43, pp. 140-141.)
373	9595	G.B.	*Fuel Research Intelligence Section, issued by Fuel Research, Section E, Greenwich.* (Summary for two weeks ending 27th March and 3rd April, 1943.)
374	9751	U.S.A. ...	*Fuels and Lubricants (Abstract of Papers, S.A.E. Meeting, Oct., 1942).* (Autom. Ind., Vol. 87, No. 11, 1/12/42, pp. 31-32.)
			Petrols.
375	9505	S. Africa ...	*Ethyl Alcohol-Petrol-Benzol.* (Mech. World, Vol. 113, No. 2,937, 16/4/43, pp. 411-413.)
376	9697	G.B.	*Military Consumption of Petrol.* (Pet. Times, Vol. 47, No. 1,192, 3/4/42, p. 164.)
			Gaseous Fuels.
377	9183	G.B.	*Gas Turbines.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 30.)
378	9314	U.S.A. ...	*War Time Chemicals from Natural Gas.* (Gustav Egloff, Petroleum Times, Vol. 47, No. 1,190, 6/3/43, pp. 110-114.)
379	9316	U.S.A. ...	*War Time Chemicals from Natural Gas (Contd.).* (G. Egloff, Pet. Times, Vol. 47, No. 1,191, 20/3/43, pp. 136-137.)
380	9317	Italy	*Italy's Methane Pipe-Line System.* (E. A. Bell, Pet. News, Vol. 47, No. 1,191, 20/3/43, p. 138.)
381	9383	U.S.A. ...	*Combustion of Common Gases (Data Sheet).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 652.)

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			Special Fuels.
382	9312	U.S.A. ...	*New Neohexane Process.* (Nat. Pet. News, Vol. 35, No. 4, 27/1/43, p. 15.)
383	9563	G.B.	*The Burning of Creosote-Pitch Mixtures.* (Engineer, Vol. 175, No. 4,555, 30/4/43, pp. 352-354.)
384	9658	G.B.	*Influence of Water Vapour upon the Combustion of Hydrocarbon Mixtures (Moist Mixtures Give Higher Flame Temp.).* (W. T. David, Nature, Vol. 151, No. 3,831, 3/4/43, p. 392.)
			Catalytic Processes.
385	9696	G.B.	*A New Catalytic Process.* (Pet. Times, Vol. 47, No. 1,192, 3/4/43, p. 162.)
386	8981	U.S.A. ...	*New Catalytic Cracking Process for High Octane Aviation Fuel (Houdry Process).* (Nat. Pet. News, Vol. 35, No. 3, 20/1/43, p. 15.)
			Oils and Lubricants.
387	9063	U.S.A. ...	*The Effects of Diluents on the Flow Properties of Crank Case Lubricants (Digest).* (J. C. Geinesse, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 74.)
388	9263	G.B.	*I.A.E. Research on Lubrication Problems.* (Petroleum Times, Vol. 47, No. 1,184, 12/12/42, p. 598.)
389	9619	G.B.	*Dry Lubrication with Colloidal Graphite.* (Airc. Prod., Vol. 5, No. 55, May, 1943, p. 247.)
390	9700	U.S.A. ..	*The Rôle of Surface Chemistry and Profile in Boundary Lubrication.* (J. T. Burwell, S.A.E. National Aeronautics Meeting, March, 1942.)
391	9041	U.S.A. ...	*Correlation of Laboratory Oil Bench Tests with Full-Scale Engine Tests.* (C. W. George, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 52-62.)
392	9052	U.S.A. ...	*Influence of Lubricating Oil Viscosity on Cylinder Wear (Digest).* (H. A. Eierett, J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, p. 65.)
393	9102	U.S.A. ...	*Lubricating Oil Detergency.* (S. K. Talley, Ind. and Eng. Chem. (Anal. Ed.), Vol. 15, No. 2, 15/2/43, pp. 83-90.)
394	9461	U.S.A. .	*A New High Quality Transparent Cutting Oil.* (Metal Progress, Vol. 42, No. 6, Dec., 1942, p. 1,114.)
395	9464	G.B.	*Insulating Oils for Cables.* (S. Beckinsale, J. Inst. Elect. Engs., Vol. 90, No. 13, Pt. 2, Feb., 1943, pp. 3-14.)
396	9465	G.B.	*Mineral Oil for Transformers and Switchgear.* (A. A. Pollitt, J. Inst. Elect. Engs., Vol. 90, No. 13, Pt. 2, Feb., 1943, pp. 15-22.)
397	9466	G.B.	*Insulating Oil in Relation to Circuit Breakers Failures.* (W. Fordham-Cooper, J. Inst. Elect. Engs., Vol. 90, No. 13, Pt. 2, Feb., 1943, pp. 23-28.)
398	9467	G.B.	*Maintenance of Insulating Oils in the Field.* (L. H. Welch, J. Inst. Elect. Engs., Vol. 90, No. 13, Pt. 2, Feb., 1943, pp. 29-34.)

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399	9468	G.B. ...	*Manufacture and Testing of Oil and Oil-Resin Saturants for Use in Electrical Equipment.* (A. W. Thomson and others, J. Inst. Elect. Engs., Vol. 90, No. 13, Pt. 2, Feb., 1943, pp. 35-53.)
400	9686	U.S.A. ...	*European Axis Oil Output in* 1942. (Nat. Pet. News, Vol. 35, No. 8, 24/2/43, p. 32.)
401	9727	G.B.	*Oil and the British Plastic Industry.* (G. Tugendhat, Aeronautics, Vol. 8, No. 3, April, 1943, p. 61.)
402	9853	Canada ...	*Oil Pipe Line in British Columbia.* (Engineer, Vol. 175, No. 4,552, 9/4/43, p. 292.)

Theory of Elasticity.

(Experiments with Beams, Plates, etc.)

403	8988	G.B.	*Results of Experiments on Metallic Beams Bent Beyond the Elastic Limit.* (E. Volterra, J. Inst. Civil Engs., Vol. 20, No. 5, March, 1943, pp. 1-18.)
404	9092	G.B.	*The Problem of Combined Stress.* (J. J. Guest, Engineering, Vol. 155, No. 4,030, 9/4/43, pp. 281-282.)
413	9292	G.B.	*The Problems of Combined Stress.* (J. J. Guest, Engineering, Vol. 155, No. 4,031, 16/4/43, pp. 303-304.)
414	9329	G.B.	*Cone Springs.* (Mech. World, Vol. 113, No.2,932, 12/3/43, pp. 278-280.)
415	9406	U.S.A. ...	*Temporary "Set" in Heavy Springs.* (Metal Progress, Vol. 43, No. 1, pp. 54-55, Jan., 1943.)
416	9414	U.S.A. ...	*Plasticity of Cold Metals.* (J. B. Friedmann, Metal Progress, Vol. 43, No. 1, p. 71, Jan., 1943.)
417	9460	U.S.A. ...	*Precision in Creep Testing.* (J. A. Fellows and others, Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,088-1,090.)
418	9510	G.B.	*Analysis of Deflections of Trusses by the Method of Translations and Rotations.* (S. T. Chen and C. H. Chen, J. Inst. of Civil Engs., Vol. 20, No. 6, April, 1943, pp. 69-86.)
419	9529	G.B.	*The Effect of Grain Size on the Tensile Strength of Tin and Tin Alloys.* (W. T. Pell-Walpole, J. Inst. Metals, Vol. 69, No. 3, March, 1943, pp. 13-46.)
420	9575	G.B.	*An* 11½-*Year Creep Test.* (Engineering, Vol. 155, No. 4,033, 30/4/43, p. 357.)

Materials.

(A) Properties.

Al. and Mg. Alloys.

421	9023	Germany ...	*Light Alloy Lock Nut.* (*Pat. series No.* 2, 730,941.) (Aluminium, Gottingen, Flugsport, Vol. 35, No. 7, 31/3/43, p. 89.)
422	9093	G.B.	*Magnesium.* (C. H. Desch, Engineering, Vol. 155, No. 4,030, 9/4/43, pp. 284-285.)
423	9106	G.B.	*Magnesium Fires.* (Metal Industry, Vol. 62, No. 16, 16/4/43, p. 254.)

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424	9108	G.B.	*Al. Alloy Bearings.* (R. Ruedy, Metal Industry, Vol. 62, No. 16, 16/4/43, pp. 248-249.)
425	9290	G.B.	*Aluminium and its Alloys in Marine Construction.* (G. O. Taylor, Metal Industry, Vol. 62, No. 17, 23/4/43, pp. 267-268.)
426	9293	G.B.	*Magnesium.* (C. H. Desch, Engineering, Vol. 155, No. 4,031, 16/4/43, pp. 304-305.)
427	9330	G.B.	*Preventing Aluminium Threads Seizing.* (Mech. World, Vol. 113, No. 2,932, 12/3/43, p. 280.)
428	9386	U.S.A. ...	*Aluminium Alloys, Compositions, Properties and Designations of American Commercial Alloys (Chart).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 675.)
429	9387	U.S.A. ...	*Aluminium Bronzes Commonly Used in Aircraft (Chart).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 678.)
430	9411	U.S.A. ...	*Magnesium Alloys (Data Sheet).* (Metal Progress, Vol. 43, No. 1, p. 65, Jan., 1943.)
431	9504	U.S.A. ...	*Drilling Deep Holes in Magnesium Alloys.* (W. W. Gilbert, A. M. Lennie, Mech. World, Vol. 113, No. 2,937, 16/4/43, pp. 407-410.)
432	9531	G.B.	*Aluminium and its Alloys in Marine Construction, V.* (G. O. Taylor, Metal Industries, Vol. 62, No. 18, 30/4/43, pp. 274-276.)
433	9539	G.B.	*Clays for Aluminium.* (Metal Industries, Vol. 62, No. 18, 30/4/43, p. 284.)
434	9761	U.S.A. ...	*Formability of Al. Alloys Used in Aircraft Fabrication.* (G. A. Brewer, Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 32-35.)
			Non-Ferrous Metals.
435	8986	G.B.	*Bulletin of British Non-Ferrous Metals Research Association.* (No. 165, March, 1943.)
436	9004	G.B.	*The Problem of Copper and Galvanized Iron in the Same Water System.* (L. Kenworthy, J. Inst. Metals, Vol. 69, No. 2, Feb., 1943, pp. 67-90.)
437	9100	G.B.	*Co-operative Research in the Metal Industries.* (H. Moore, Engineering, Vol. 155, No. 4,030, 9/4/43, pp. 295-296.)
438	9279	G.B.	*Spot Testing of Metals (Cobalt, Nickel and Copper).* (A. Steigmann, J. Soc. Chem. and Ind., Vol. 62, No. 3, March, 1943, pp. 42-43.)
439	9280	G.B.	*Spot Testing for Lead, Mercury and Zinc.* (A. Steigmann, J. Soc. Chem. and Ind., Vol. 62, No. 3, March, 1943, pp. 43-44.)
440	9287	G.B.	*Metallurgy of Secondary Tin and Lead.* (G. E. Behr, Metal Industry, Vol. 62, No. 17, 23/4/43, pp. 261-263.)
441	9305	G.B.	*The Effect of Selenium, Tellurium and Bismuth on Copper.* (M. Cook and G. Parker, Engineering, Vol. 155, No. 4,032, 23/4/43, p. 338.)
442	9385	U.S.A. ...	*Non-Ferrous Metals (Symposium of Papers).* (Various Authors, Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 665-672.)

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443	9454	U.S.A.	...	*Spot Test for Rapid Detection of Chromium.* (W. O. Philbrook, Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,035-1,037.)
444	9455	U.S.A.	...	*Lead Production and its Industrial Uses.* (Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,039 and 1,124.)
445	9493	U.S.A.	...	*Nickel in Bronze. The Effect of Replacing Tin by Nickel on the Porosity, Mechanical Properties and Corrosion Resistance.* (A. H. Hesse and J. L. Basil, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 44-71.)
446	9533	G.B. ...	...	*Precipitation in the Copper-Silver Alloys—I.* (Metal Industries, Vol. 62, No. 18, 30/4/43, p. 279.)
447	9566	U.S.A.	...	*Tin Alloy Steel.* (Engineer, Vol. 175, No. 4,555, 30/4/43, p. 355.)
448	9571	G.B. ...	...	*Effect of Selenium, Tellurium and Bismuth on Copper.* (M. Cook and G. Parker, Engineering, Vol. 155, No. 4,033, 30/4/43, p. 345.)
				Bearings and Solders.
449	9116	G.B. ...	...	*Centrifugally Cast Lead-Bronze Bearings.* (Metal Industry, Vol. 62, No. 15, 9/4/43, pp. 235-236.)
450	9131	U.S.A.	...	*Cast Iron Replaces Steel in Bearings.* (Ind. and Eng. Chem., Vol. 21, No. 4, 25/2/43, p. 244.)
451	9209	G.B. ...	...	*Oil-Retaining Bronze Bearings Replace Ball Bearings.* (Machinist, Vol. 86, No. 46, 27/2/43, p. 292 E.)
452	9334	G.B. ...	...	*Solder Creams and Compounds.* (Mech. World, Vol. 113, No. 2,933, 19/3/43, pp. 302-303.)
453	9401	U.S.A.	...	*Iridium Improves Bearings and Solders.* (Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 777-778.)
454	9407	U.S.A.	...	*A New Soft Solder of Lead-Arsenic-Antimony Alloy.* (R. L. Dowdell and others, Metal Progress, Vol. 43, No. 1, pp. 56-59, 96, Jan., 1943.)
455	9415	U.S.A.	...	*Fixing Bearings in Steel Shells without Using Tin.* (W. Copey, Metal Progress, Vol. 43, No. 1, p. 75, Jan., 1943.)
456	9542	Australia	...	*Note on Earlier Paper Dealing with "The Factors Governing the Adhesion of Tin-Base Bearing Metals."* (I. Laszlo, J. Inst. of Metals, Vol. 69, No. 4, April, 1943, pp. 189-190.)
				Plastics and Resins.
457	9082	U.S.A.	...	*New Application of "Panelyte" Plastic in the Aircraft Industry.* (C. R. Mahaney, J.S.A.E., Vol. 50, No. 11, Nov., 1942, p. 62.)
458	9083	U.S.A.	...	*A Schematic Procedure for Identification of Common Commercial Plastics.* (H. Nechamkin, Ind. and Eng. Chem., Vol. 15, No. 1, Jan. 13, 1943, pp. 40-41.)
459	9118	Germany	...	*Synthetic Resin Plastics for Bearings in Screw Conveyors (from Kunststaffe).* (F. Bechtold, British Plastics, Vol. 14, No. 167, April, 1943, pp. 640-644.)

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460	9119	U.S.A. ...	*Vinyl Copolymer Resin for Air-Drying Castings.* (British Plastics, Vol. 14, No. 167, April, 1943, pp. 640-644.)
461	9120	G.B. ...	*Education in the World of Plastics.* (V. E. Yarsley, British Plastics, Vol. 14, No. 167, April, 1943, pp. 648-651.)
462	9124	G.B. ...	*Plastics Printing Plates.* (British Plastics, Vol. 14, No. 167, April, 1943, p. 660.)
463	9126	U.S.A. ...	*A New Method of Moulding Plastics with a Liquid (American Patent).* (British Plastics, Vol. 14, No. 167, April, 1943, pp. 672-674.)
464	9132	U.S.A. ...	*Fatigue Resistance of Flexible Plastic Sheetings.* (F. W. Duggan and K. K. Fligor, Ind. and Eng. Chem. (Ind. Ed.), Vol. 35, No. 2, Feb., 1943, p. 172.)
465	9179	G.B. ...	*Resilitex—A New Fabric Material.* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 432.)
466	9192	G.B. ...	*Problem of Raw Material for Plastics.* (V. E. Yarsley, Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 44.)
467	9203	G.B. ...	*Progress in Sheet Plastic.* (V. E. Yarsley, Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 44.)
468	9212	G.B. ...	*Working with Plastics.* (J. Sasso, Machinist, Vol. 86, No. 46, 27/2/43, pp. 1,280-1,281.)
470	9341	U.S.A. ...	*Substitute Materials.* (J. G. Wood and R. F. Sanders, J.S.A.E., Vol. 51, No. 2, March, 1943, pp. 79-83.)
471	9753	U.S.A. ...	*Transparent Plastic Models Facilitate Design and Research (Connecting Rods, Crankshafts, etc.).* (Autom. Ind., Vol. 87, No. 11, 1/12/42, pp. 44 and 96.)
			Wood, Wood Plastic, Glue.
472	9032	U.S.A. ...	*Strength Characteristics of Plastic Bonded Plywood.* (G. R. Parsons, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 1-7.)
473	9033	U.S.A. ...	*Bearing Strength of Plastics and Plywood.* (T. Bond, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 9-14.)
474	9081	U.S.A. ...	*Wood Plastics in the Mass Production of Aircraft (Digest).* (C. L. Bates and H. T. Black, J.S.A.E., Vol. 50, No. 11, Nov., 1942, p. 62.)
475	9122	G.B. ...	*Gap-Filling Glues.* (British Plastics, Vol. 14, No. 167, April, 1943, pp. 656 and 691.)
476	9319	G.B. ...	*Moulded Plywood.* (J. S. Barnes, Mech. World, Vol. 113, No. 2,935, 2/4/43, pp. 350-353.)
477	9445	U.S.A. ...	*Plywood Adhesives—Characteristics and Handling Methods.* (Aviation, Vol. 42, No. 1, pp. 173-175, Jan., 1943.)
			Rubber (Nat. and Syn.).
478	9034	U.S.A. ...	*Applications and Unusual Properties of Synthetic Rubbers.* (O. D. Cole, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 15-20.)

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479	9101	U.S.A. ...	*Synthetic Rubber—A Spectroscopic Method for Analysis and Control.* (R. B. Barnes and others, Ind. and Eng. Chem. (Anal. Ed.), Vol. 15, No. 2, 15/2/43.)
480	9122	U.S.A. ...	*Norepol Synthetic Rubber.* (British Plastics, Vol. 14, No. 167, April, 1943, p. 658.)
481	9134	U.S.A. ...	*Orientation of Crystalline Phases on Stretching of Rubber Stocks.* (G. L. Clark and others, Ind. and Eng. Chem. (Ind. Ed.), Vol. 35, No. 2, Feb., 1943, pp. 198-204.)
482	9135	U.S.A. ...	*Properties of Rubber Solutions and Gels.* (M. L. Huggins, Ind. and Eng. Chem. (Ind. Ed.), Vol. 35, No. 2, Feb., 1943, pp. 216-220.)
483	9265	G.B. ...	*Chemistry of Synthetic Rubbers.* (Nat. Pet. News, Vol. 34, No. 41, 14/10/42, pp. 20-22.)
484	9273	G.B. ...	*Properties of Rubber as Used in Metal Drawing and Pressing.* (L. J. Brown, Sheet Metal Industry, Vol. 17, No. 191, March, 1941, pp. 467, 476, 496.)
485	9685	U.S.A. ...	*Synthetic Rubber Production in U.S.A.* (Nat. Pet. News, Vol. 35, No. 8, 24/2/43, pp. 20-26 and 37.)
			Dies.
486	9196	G.B. ...	*Plastic Dies.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 32.)
487	9309	G.B. ...	*Simple Core Mechanisms for Die Casting Dies.* (H. K. Barton, Machinery, Vol. 62, No. 1,589, 25/3/43, pp. 331-333.)
488	9398	U.S.A. ...	*Rules Governing Forging Machine Dies.* (E. R. Frost, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 756.)
489	9514	G.B. ...	*Future Development of the Rubber Die Press.* (W. W. MacArthur, Machinery, Vol. 62, No. 159, 8/4/43, pp. 370-371.)
490	9521	G.B. ...	*Press Practice with Rubber Dies (Book Review).* (Machinery, Vol. 62, No. 1,592, 15/4/43, p. 401.)
			Glass, Sapphires, Silver.
491	9015	Germany ...	*Joining Laminated Hard Glass to Metal. (Pat. series No. 2, 732,014.)* (Focke-Wulf, Flugsport, Vol. 35, No. 7, 31/3/43, p. 5.)
492	9194	G.B. ...	*The Uses of Silver in Industry.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 28.)
493	9204	G.B. ...	*New Uses for Glass.* (Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 43.)
494	9288	G.B. ...	*Sapphire Tool Tips.* (Metal Industry, Vol. 62, No. 17, 23/4/43, p. 263.)
495	9434	U.S.A. ...	*Strength Properties of Plexiglas (Impact Strength), Pt. I.* (W. F. Bartoe, Aviation, Vol. 42, No. 1, pp. 128-135, Jan., 1943.)
496	9565	U.S.A. ...	*Organic Glass—New Transparent Resin CR. 39.* (Engineer, Vol. 175, No. 4,555, 30/4/43, p. 355.)

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			Iron and Steel.
497	9182	G.B. ...	... *Alloy Steel Supply in U.S.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, pp. 17-18.)
498	9289	G.B. ...	... *Pickling of Old Roller Steel.* (Metal Industry, Vol. 62, No. 17, 23/4/43, p. 266.)
499	9321	G.B. ...	... *Cast Iron Crankshafts.* (C. S. Darling, Mech. World, Vol. 113, No. 2,935, 2/4/43, pp. 354-357.)
500	9342	U.S.A.	... *Production Experience in N.E. Steels.* (R. W. Roush, J.S.A.E., Vol. 51, No. 3, March, 1943, pp. 84-93.)
501	9372	U.S.A.	... *Steels and Irons (Collection of Short Articles on American Production, etc.).* (Various authors, Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 525-588.)
502	9373	U.S.A.	... *Specific Effects of Alloys in Steel (Chart).* (E. C. Bain, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 539.)
503	9375	U.S.A.	... *Standard Grain Sizes for Steel (Chart).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 550.)
504	9379	U.S.A.	... *Iron, Iron Carbide Equilibrium Diagram.* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 606.)
505	9380	U.S.A.	... *Transformation of Austenite in 0.89 per cent. Carbon Steel (Diagram).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 617.)
506	9393	U.S.A.	... *Hardness Conversion Chart for Steels.* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 723.)
507	9402	U.S.A.	... *Equilibria for Gas-Steel Reactions (Chart).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 712.)
508	9408	U.S.A.	... *Quick Immersion Technique for Molten Steel Temperatures.* (J. H. G. Monypenny, Metal Progress, Vol. 43, No. 1, pp. 67-68, Jan., 1943.)
509	9416	U.S.A.	... *Computing Strength of Normalized Steel from its Analysis.* (F. M. Walters, Metal Progress, Vol. 43, No. 1, p. 76, Jan., 1943.)
510	9419	U.S.A.	... *Revised List of National Emergency Alloy Steels.* (Metal Progress, Vol. 43, No. 1, p. 90, Jan., 1943.)
511	9421	U.S.A.	... *Estimate of Steel for 1943.* (Metal Progress, Vol. 43, No. 1, pp. 100-102, Jan., 1943.)
512	9422	U.S.A.	... *Iron and Steel in Nazi Germany.* (Metal Progress, Vol. 43, No. 1, pp. 108-118, Jan., 1943.)
513	9456	U.S.A.	... *Defects in Cast and Wrought Steel Caused by Hydrogen.* (C. A. Zappfe, Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,051-1,056.)
514	9458	U.S.A.	... *Saving Alloys in Steels by Using "Addition Agents" (Symposium of Papers).* (Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,061-1,069 and 1,100.)
515	9463	U.S.A.	... *The Sponge Iron Process in the Production of Steel.* (C. Williams, Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,043-1,047.)
516	9517	U.S.A.	... *Substitute Steels for Gearing.* (Machinery, Vol. 62, No. 1,591, 8/4/43, pp. 379-382.)

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517	9622	U.S.A. ...	*Magnetic Iron Aluminium Alloy (U.S. Patent).* (Airc. Prod., Vol. 5, No. 55, May, 1943, p. 248.)
518	9734	G.B.	*Practical Workshop Classification of Steels by Spark Tests.* (E. Skerry, Airc. Eng., Vol. 15, No. 169, March, 1943, pp. 83-84.)
			General Characteristics of Metals.
519	9000	G.B.	*Hardness Testing of Metals.* (Machine Tool Review, Vol. 30, No. 182, Sept.-Dec., 1942, pp. 71-74.)
520	9278	G.B.	*"Oiliness" and Surface Roughness.* (J. J. Bikerman, J. Soc. Chem. and Ind., Vol. 62, No. 3, March, 1943, pp. 41-42.)
521	9283	G.B.	*Electrode Potentials of Metals.* (A. H. Turnbull and H. C. Davis, R. and M., No. 1,901.)
522	9376	U.S.A. ...	*Rating of Inclusion ("Dirt" Chart).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 562.)
523	9382	U.S.A. ...	*Properties of Refractory Materials, Except Fireclay (Table).* (Metal Industry, Vol. 42, No. 4, Oct., 1942, p. 640.)
524	9384	U.S.A. ...	*Hardenability Calculated from Composition (Chart).* (M. A. Grossmann, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 660.)
525	9391	U.S.A. ...	*Ruling a Grating on Smooth Metal Reveals Hardness Variations.* (Bo. Ljuggren, Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 698-704.)
526	9395	U.S.A. ...	*Standard Tolerances for Forgings up to 100 lb.* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 730.)
527	9462	U.S.A. ...	*Caustic Embrittlement.* (Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,134-1,140.)
528	9530	G.B.	*Metallurgical Abstracts (Vol. 10, Pt. 3, March, 1943, pp. 65-100).* (J. Inst. Metals, Vol. 69, No. 3, March, 1943.)
529	9543	G.B.	*Metallurgical Abstracts (Vol. 10, Part 4, April, 1943).* (J. Inst. Metals, Vol. 69, No. 4, April, 1943, pp. 101-132.)
			Corrosion.
530	9003	G.B.	*New Methods for the Examination of Corroded Metal.* (F. A. Champion, J. Inst. Metals, Vol. 69, No. 2, Feb., 1943, pp. 47-66.)
531	9036	U.S.A. ...	*Corrosion of Stressed Alloy Steel Bars by High Temperature Steel.* (H. L. Solberg and others, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 47-52.)
532	9050	U.S.A. ...	*Corrosion of Bearing Alloys (Digest).* (L. M. Tichvinsky, J.S.A.E., Vol. 51, No. 2, Feb., 1943, pp. 63-64.)
533	9295	G.B.	*Corrosion of Metals by Flue Gases.* (Engineering, Vol. 155, No. 4,031, 16/4/43, pp. 307-308.)
534	9303	G.B.	*Effect of Zinc on Corrosion Fatigue of Steels.* (N. Stuart and U. R. Evans, Engineering, Vol. 155, No. 4,032, 23/4/43, pp. 336-337.)
535	9340	U.S.A. ...	*Corrosion of Bearing Alloys.* (L. M. Tichvinsky, J.S.A.E., Vol. 5, No. 3, March, 1943, pp. 69-77.)

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536	9377	U.S.A. ...	*Huey Corrosion Test for 18-8 Steel.* (F. Meunier and H. M. Schnadt, Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 564-574.)
537	9457	U.S.A. ...	*Nomograph for Calculation of Corrosion Rates (Data Sheet).* (L. D. Yates and E. P. Tait, Metal Progress, Vol. 42, No. 6, Dec., 1942, p. 1,059.)
			(B) Fabrication.
			Welding, Brazing.
538	8994	U.S.A. ...	*Deep Girders Welded from Plate and Split H-Beam (Photograph).* (Engineering News Record, Vol. 128, No. 6, 5/2/42, p. 10.)
539	9264	G.B.	107 *Abstracts Covering Current Literature.* (Welding Lit. Review, Vol. 5, No. 1, Feb., 1943.)
540	9275	G.B.	*Spot Welding as Applied to Aircraft Structures.* (E. S. Jenkins, Sheet Metal Industry, Vol. 17, No. 191, March, 1941, pp. 499-501 and 516.)
541	9276	G.B.	*Arc Welding of Mg. Alloys.* (W. S. Loose and A. R. Orban, Sheet Metal Industry, Vol. 17, No. 191, March, 1941, pp. 503-512 and 514.)
542	9301	G.B.	*Repair of Drills by Welding.* (Engineering, Vol. 155, No. 4,032, 23/4/43, p. 327.)
543	9307	G.B.	*Machine Design for Fabricated Welded Construction.* (F. Koenigsberger, Machinery, Vol. 62, No. 1,589, 25/3/43, pp. 316-328.)
544	9315	G.B.	*Propane for Welding.* (Petroleum Times, Vol. 47, No. 1,190, 6/3/43, p. 116.)
545	9335	G.B.	*Helium-Shielded Arc Welding.* (Mech. World, Vol. 113, No. 2,932, 19/3/43, p. 311.)
546	9396	U.S.A. ...	*Welding Symbols Adopted by American Welding Society,* 1941. (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 744.)
547	9399	U.S.A. ...	*Fluxes for Oxy-Acetylene Welding and Brazing.* (H. E. Landis and F. C. Saacke, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 766.)
548	9453	U.S.A. ...	*Metallurgical Aspects of Spot Welds in Aluminium Alloys.* (J. R. Heising and E. H. Burkart, Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,027-1,034.)
549	9496	U.S.A. ...	*"Heliarc" Welding (from Welding J., Dec., 1942).* (T. E. Piper, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 122-125.)
550	9525	U.S.A. ...	*A Wiring Template for Resistance-Welder Controls.* (Machinery, Vol. 62, No. 1,592, 15/4/43, p. 409.)
551	9526	U.S.A. ...	*"Heliarc" Welding.* (Machinery, Vol. 62, No. 1,592, 15/4/43, p. 413.)
552	9587	Canada ...	*"Heliarc" Welding.* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, pp. 92-96.)
553	9712	U.S.A. ...	*Men and Machines (Pt. II) (Drilling and Welding, etc.).* (Autom. Ind., Vol. 87, No. 6, 15/9/42, pp. 46-47 and 78-80.)
554	9745	Canada ...	*Conservation of Welding Electrode.* (Canadian Aviation, Vol. 15, No. 8, Aug., 1942, pp. 68-72.)
555	9776	U.S.A. ...	*Men and Machines (Pt. I).* (Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 40-42 and 64.)

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556	9952	G.B. ...	... *Welding Broken Drills.* (Engineer, Vol. 175, No. 4,552, 9/4/43, p. 293.)
			Surface Treatment.
557	9075	U.S.A.	... *Metal Spraying for Reclamation of Automotive Parts (Digest).* (H. S. Ingham and J. E. Wakefield, J.S.A.E., Vol. 50, No. 11, Nov., 1942, pp. 59 and 62.)
558	9109	G.B. ...	... *Conservation of Tin.* (Metal Industry, Vol. 62, No. 16, 16/4/43, p. 249.)
559	9110	G.B. ...	... *Electrodeposition of Silver on Magnesium.* (F. J. Bowen and L. I. Gilbertson, Metal Industry, Vol. 62, No. 16, 16/4/43, p. 252.)
560	9129	U.S.A.	... *Luminous Paints.* (Ind. and Eng. Chem., Vol. 21, No. 4, 25/2/43, p. 277.)
561	9274	G.B. ...	... *Coating by the Electric Spray Method.* (H. Ransburg, Sheet Metal Industry, Vol. 17, No. 191, March, 1941, pp. 445-447.)
562	9410	U.S.A.	... *Uses of Replica Coatings in Metallography.* (J. I. Wexlin, Metal Progress, Vol. 43, No. 1, p. 69, Jan., 1943.)
563	9528	G.B. ...	... *Surface Protection of Magnesium Alloys.* (N. Parkinson and J. W. Cuthbertson, J. Inst. Metals, Vol. 69, No. 3, March, 1943, pp. 109-130.)
564	9534	G.B. ...	... *"Throwing Power" of Plating Solutions.* (C. B. F. Young and Al. Zminkaski, Metal Industry, Vol. 62, No. 18, 30/4/43, pp. 280-282.)
565	9620	G.B. ...	... *Testing Tin Coatings.* (Airc. Prod., Vol. 5, No. 55, May, 1943, p. 248.)
566	9950	G.B. ...	... *Plastic Treatment for Porous Castings.* (Engineer, Vol. 175, No. 4,552, 9/4/43, p. 293.)
			Heat Treatment and Furnaces.
567	9002	G.B. ...	... *Heat Treatment Equipment.* (Machine Tool Review, Vol. 30, No. 182, Sept.-Dec., 1942, pp. 86-87.)
568	9111	G.B. ...	... *Flowing of Tin by Induction Heating.* (G. E. Stoltz, Metal Industry, Vol. 62, No. 16, 16/4/43, pp. 251-252.)
569	9213	G.B. ...	... *Controlled Heat Treating Atmospheres, I and II.* (Machinist, Vol. 86, No. 46, 27/2/43, p. 1,298 a.)
570	9281	G.B. ...	... *Electric Furnace.* (J. Sci. Insts., Vol. 20, No. 2, Feb., 1943, p. 33.)
571	9311	G.B. ...	... *Heat Treatment of the Wrought Aluminium Alloys (Part I—Practice).* (Bull. No. 3, issued by Wrought Light Alloys Development Ass.)
572	9322	G.B. ...	... *Tin Economy by Induction Heating.* (Mech. World, Vol. 113, No. 2,935, 2/4/43, p. 362.)
573	9378	U.S.A.	... *Furnaces and Heat Treatment (Symposium of Papers).* (Various Authors, Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 591-660.)
574	9417	U.S.A.	... *Heat Treating for Machinability.* (L. E. Webb, Metal Progress, Vol. 43, No. 1, pp. 87-89, Jan., 1943.)

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575	9420	U.S.A. ...	*Simple Apparatus for Sorting Heat-Treated Ferrous Parts from Untreated Parts.* (R. J. Brown, Metal Progress, Vol. 43, No. 1, p. 92, Jan., 1943.)
576	9424	U.S.A. ...	*Heat Treating Tray.* (Metal Progress, Vol. 43, No. 1, p. 122, Jan., 1943.)
577	9425	U.S.A. ...	*Local Heating by Electrical Induction.* (Metal Progress, Vol. 43, No. 1, p. 124, Jan., 1943.)
578	9538	G.B.	*Heat Treatment of Aluminium.* (Metal Industry, Vol. 62, No. 18, 30/4/43, p. 284.)
579	8999	G.B.	*Solid Coal Firing for Metallurgical Furnaces.* (Machine Tool Review, Vol. 30,, No. 182, Sept.-Dec., 1942, pp. 69-70.)
			Flame-Cutting and Hardening.
580	9035	U.S.A. ...	*Analytical Investigation of Metal Cutting with Abrasive (Suggestions for Research).* (W. B. Heinz, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 21-29.)
581	9132	G.B.	*Flame Cutting of Armour Plate.* (Engineer, Vol. 175, No. 4,552, 9/4/43, pp. 296-297.)
582	9298	G.B.	*Flame Cutting of Rolled Armour Plate.* (Engineering, Vol. 155, No. 4,031, 16/4/43, p. 316.)
583	9509	G.B.	*Rolled Armour Plate (Bulletin on Machine Flame Cutting).* (Mech. World, Vol. 113, No. 2,937, 16/4/43, p. 423.)
584	9513	G.B.	*The Flame Hardening Process.* (Machinery, Vol. 62, No. 1,591, 8/4/43, p. 365.)
585	9537	G.B.	*Machine Flame Cutting of Rolled Armour Plate (Issued by the Min. of Supply).* (Metal Industry, Vol. 62, No. 18, 30/4/43, p. 283.)
			Machining, Polishing, etc.
586	9114	G.B.	*Machining Al. and its Alloys.* (R. L. Templin, Metal Industry, Vol. 62, No. 15, 9/4/43, pp. 231-233.)
587	9306	G.B.	*Machining Operations on Locomotive Parts.* (Machinery, Vol. 62, No. 1,589, 25/3/43, pp. 309-312.)
588	9392	U.S.A. ...	*Electrolytic Polishing of Metals (Chart).* (G. E. Pellissier, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 709.)
589	9400	U.S.A. ...	*Metal Cleaning and Finishing (Symposium of Papers).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 773.)
590	9535	G.B.	*Polishing Methods Prior to Plating.* (Metal Industry, Vol. 62, No. 18, 30/4/43, p. 282.)
591	9653	U.S.A. ...	*Standard Surface Finishes.* (W. J. Darmondy, Army Ordnance, Vol. 24, No. 136, Jan.-Feb., 1943, pp. 99-101.)
592	9666	U.S.A. ...	*Machining Fine Conical Points.* (M. Hall, Machinist, Vol. 86, No. 44, 13/2/43, p. 276 E.)
			Extrusion, Stamping, Rolling-in.
593	9001	G.B.	*Cecostamping—A New Technique in Presswork.* (Machine Tool Review, Vol. 30, No. 182, Sept.-Dec., 1942, pp. 73-79.)

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594	9037	U.S.A. ...	*Automatic Uniform Rolling-in of Small Tubes.* (F. F. Fisher and E. T. Cope, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 53-60.)
595	9077	U.S.A. ...	*Impact Extrusion and Cold Pressing of Aeroplane Parts (Digest).* (P. Krenig, J.S.A.E., Vol. 50, No. 11, Nov., 1942, pp. 60-61.)
596	9333	G.B.	*A New Electrolyte Etching Process.* (Mech. World, Vol. 113, No. 2,933, 19/3/43, p. 302.)
			Casting.
597	8970	Germany ...	*Alloy Steel Castings, Their Properties and Field of Application.* (H. Juretzek, Giesserei, Vol. 29, 1942, pp. 217-226 and 243-249.)
598	9113	G.B.	*The Sand-Casting of Magnesium Alloys.* (F. A. Fox, Metal Industry, Vol. 62, No. 15, 9/4/43, pp. 226-230.)
599	9121	G.B.	*Salvage of Porous Castings.* (British Plastics, Vol. 14, No. 167, April, 1943, pp. 652 and 688.)
600	9286	G.B.	*Centrifugal Casting—I.* (H. B. Zuehlke, Metal Industry, Vol. 62, No. 17, 23/4/43, pp. 258-260.)
601	9532	G.B.	*Centrifugal Casting—II.* (H. B. Zuehlke, Metal Industry, Vol. 62, No. 18, 30/4/43, pp. 277-279.)
			Powder Metallurgy.
602	9115	G.B.	*Powder Metallurgy.* (W. D. Jones, Metal Industry, Vol. 62, No. 15, 9/4/43, p. 237.)
603	9325	G.B.	*Powder Metallurgy—its Products and Their Various Applications.* (W. D. Jones, Mech. World, Vol. 113, No. 2,922, 12/3/43, pp. 269-272.)
604	9409	U.S.A. ...	*Iron Powder.* (C. Hardy, Metal Progress, Vol. 43, No. 1, pp. 62-64, 126, Jan., 1943.)
			Machines.
605	9404	U.S.A. ...	*Plastic Punches for Drop Hammer and Hydraulic Press.* (Aero Digest, Vol. 42, No. 2, pp. 121-128, Feb., 1943.)
606	9423	U.S.A. ...	*New Hydraulic Press.* (Metal Progress, Vol. 43, No. 1, p. 122, Jan., 1943.)
607	9522	G.B.	*A Revolving Lathe Steady.* (E. J. Pratt, Machinery, Vol. 62, No. 1,592, 15/4/43, p. 403.)
608	9597	G.B.	*Spar Milling—A New Machine Incorporating Hydraulic Copying Mechanism and Automatic Variable Feeds.* (Airc. Prod., Vol. 5, No. 55, May, 1943, pp. 230-233.)
609	9667	G.B.	*Precision Filing and Sawing Machine.* (B. Elliott, Machinist, Vol. 86, No. 44, 13/2/43, pp. 277-278.)
			Tools.
610	8998	G.B.	*Maintenance of Cutting Tools.* (Machine Tool Review, Vol. 30, No. 182, Sept.-Dec., 1942, pp. 66-69.)
611	9320	G.B.	*Cutting Tool Life and Efficiency (Official Recommendations).* (Mech. World., Vol. 113, No. 2,935, 2/4/43, pp. 352-353.)
612	9374	U.S.A. ...	*Tool Steels Classified by Wear Toughness Ratio (Data Sheet).* (H. B. Chambers, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 542.)

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613	9397	U.S.A. ...	*Tool Steels for Hot Working Iron and Steel.* (H. E. Replogle, Vol. 42, No. 4, Oct., 1942, p. 750.)
614	9572	G.B. ...	*Holders for Ardoloy Cutting Tools.* (Engineering, Vol. 155, No. 4,033, 30/4/43, p. 347.)
615	9648	U.S.A. ...	*Conserving Tool Steels.* (Army Ordnance, Vol. 24, No. 137, March-April, 1943, pp. 330-331.)
616	9664	U.S.A. ...	*Maintenance of Press Tools—I.* (H. R. Hageman, Machinist, Vol. 86, No. 44, 13/2/43, pp. 1,216-1,217.)
			Miscellaneous.
617	9112	G.B. ...	*Colloidal Graphite as a Lubricant in Metal Working.* (E. A. Smith, Metal Industry, Vol. 62, No. 16, 16/4/43, p. 250.)
618	9308	G.B. ...	*Scienal Grinding Fluid.* (Machinery, Vol. 62, No. 1,589, 25/3/43, p. 330.)
619	9381	U.S.A. ...	*Cooling Power of Quenching Baths (Curves whereby Severity of Quench can be Estimated).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 622.)
620	9394	U.S.A. ...	*Metal Working (Symposium of Papers).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 727-740.)
			(C) Inspection.
			X-Ray.
621	9536	G.B. ...	*Industrial X-Ray Unit.* (Metal Industry, Vol. 62, No. 18, 30/4/43, p. 282.)
622	9540	G.B. ...	*The Structure of Rolled and Annealed Aluminium as Revealed by X-Ray.* (E. E. Spillett, J. Inst. of Metals, Vol. 69, No. 4, April, 1943, pp. 149-175.)
623	9541	G.B. ...	*An X-Ray Study of the Transformation of Cobalt.* (O. Edwards and H. Lipson, J. Inst. of Metals, Vol. 69, No. 4, April, 1943, pp. 177-178.)
624	9766	U.S.A. ...	*X-Ray Technique in Foundry Works.* (Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 46 and 86.)
			Electrographic, Photometric, etc.
625	9087	U.S.A. ...	*Electrographic Detection of Molybdenum in Steel Alloys.* (J. A. Calamari and others, Ind. and Eng. Chem., Vol. 15, No. 1, 13/1/43, p. 71.)
626	9088	U.S.A. ...	*Micro-Determination of Carbon in Steels.* (E. W. Balis and others, Ind. and Eng. Chem., Vol. 15, No. 1, 13/1/43, pp. 68-69.)
627	9104	U.S.A. ...	*Quantitative Spectrographic Analysis of Stainless Steels.* (M. F. Hasler and C. E. Harvey, Ind. and Eng. Chem. (Anal. Ed.), Vol. 15, No. 2, 15/2/43, pp. 102-107.)
628	9117	G.B. ...	*Detecting Discontinuities by the Fluorescent Method.* (T. de Forest, Metal Industry, Vol. 62, No. 15, 9/4/43, pp. 233-234.)
629	9277	G.B. ...	*Rapid Photometric Determination of Cobalt in Steels.* (F. W. Haywood and A. A. R. Wood, J. Soc. Chem. and Ind., Vol. 62, No. 3, March, 1943, pp. 37-39.)

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630	9388	U.S.A.	... *Testing v. Control Instruments (Symposium of Papers).* (Various Authors, Metal Progress, Vol. 42, No. 4, Oct., 1942, pp. 687-696.)
631	9412	U.S.A.	... *Magnetic Balance for Inspection.* (A. V. de Forest, Metal Progress, Vol. 43, No. 1, p. 69, Jan., 1943.)
632	9413	U.S.A.	... *Metallography by Electron Microscope.* (D. Harker and V. J. Schaefer, Metal Progress, Vol. 43, No. 1, pp. 68-69, Jan., 1943.)
633	9459	U.S.A.	... *Electrographic Methods of Surface Analysis.* (M. S. Hunter and others, Metal Progress, Vol. 42, No. 6, Dec., 1942, pp. 1,070-1,076.)
634	9500	U.S.A.	... *Fluorescent Magnetic Inspection (from Metals and Alloys, Nov., 1942).* (J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 169-173.)
635	9501	U.S.A.	... *Sodium Light for Microscopic Flaw Detection.* (J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, p. 181.)
636	9574	G.B. ...	... *The "Hyglo" Crack Detection Process.* (Engineering, Vol. 155, No. 4,033, 30/4/43, p. 357.)

Instruments.

Aircraft.

637	9360	U.S.A.	... *Vultee Flight Test Recorder (Wireless Transmission of Inst. Readings).* (Aero Digest, Vol. 42, No. 2, pp. 255-262, Feb., 1943.)
638	*9439	U.S.A.	... *A Radio Flight Test Recorder Developed by Vultee Aircraft Co.* (Aviation, Vol. 42, No. 1, p. 163, Jan., 1943.)

Stress-Strain Measuring.

640	9328	G.B. ...	... *Lindley Extensometer for Determination of Proof Stress, etc.* (Mech. World, Vol. 113, No. 2,932, 12/3/42, p. 276.)
641	9763	U.S.A.	... *Application of the Electric Strain Gauge in Aircraft Structural Design.* (Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 40-42 and 64.)

Optical.

642	9180	G.B. ...	... *The Binomag Binocular Magnifier.* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 432.)

Rotameter, Balances, Gauges.

643	9084	U.S.A.	... *A Versatile Continuous Reading Thermionic Voltmeter.* (L. J. Anderson and J. C. Hindman, Ind. and Eng. Chem., Vol. 15, No. 1, 13/1/43, pp. 42-45.)
644	9085	U.S.A.	... *Simple Automatic and Recording Balance.* (N. W. Muller and R. E. Peck, Ind. and Eng. Chem., Vol. 15, No. 1, 13/1/43, pp. 46-48.)
645	9086	U.S.A.	... *An Instrument for Making Uniform Films by the Dip Method.* (H. F. Payne, Ind. and Eng. Chem., Vol. 15, No. 1, 13/1/43, pp. 48-56.)
646	9336	U.S.A.	... *Glass Gauges.* (F. J. Oliver, The Iron Age, 4/2/43, pp. 35-39 and 98, 100.)

* Abstract available.

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647	9350	U.S.A.	...	*High Voltage Air Filter for Removing Oil Vapour in Machine Shop.* (Aero Digest, Vol. 42, No. 2, pp. 331-332, Feb., 1943.)
648	9352	U.S.A.	...	*Technical Aspects of Rotameters.* (W. J. Diament, Aero Digest, Vol. 42, No. 2, pp. 138-142, Feb., 1943.)
649	9649	U.S.A.	...	*Glass Precision Gauges.* (Army Ordnance, Vol. 24, No. 137, March-April, 1943, pp. 331-332.)
650	9719	U.S.A.	...	*The Space Time Recorder.* (F. N. M. Brown, 10th Annual Meeting of the Institute Aeronautical Sciences, Jan., 1943.)
				Conversion Tables and Charts.
651	9370	U.S.A.	...	*Conversion Table for Lengths.* (C. Hering, Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 522 V.)
652	9371	U.S.A.	...	*Temperature Conversion (Table).* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 522 X.)
653	9389	U.S.A.	...	*Psychometric Chart, High Range.* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 689.)
654	9390	U.S.A.	...	*Psychometric Chart, Low Range.* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 692.)
655	9498	U.S.A.	...	*Classification of Relays (from Product Engineering, Oct.-Nov., 1942).* (R. B. Immel, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 131-144.)

Production.

Organisation and Planning.

656	9181	G.B. ...	...	*Industrial Planning—VII.* (G. W. Beale, Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 12.)
657	9193	G.B. ...	...	*Production Planning—VI.* (G. W. Beale, Trade and Engineering Times, Vol. 52, No. 948, Feb., 1943, p. 12.)
658	9210	G.B. ...	...	*Redesign to Simplify Production.* (J. Haydock, Machinist, Vol. 86, No. 46, 27/2/43, pp. 1,277-1,279.)
659	9268	G.B. ...	...	*Production in Small Factories.* (Mech. World, Vol. 113, No. 2,928, 12/2/43, pp. 178-179.)
660	9327	G.B. ...	...	*Organisation and Working of Joint Production Committees in the United States.* (Mech. World, Vol. 113, No. 2,932, 12/3/42, p. 273.)
661	9363	U.S.A.	...	*Production Control of Design Changes.* (J. D. Robbins, Aero Digest, Vol. 42, No. 2, pp. 215-216, 271, Feb., 1943.)
662	9512	G.B. ...	...	*Organisation and Execution of Engineering Work.* (C. J. S. King, J. Inst. of Civil Engs., Vol. 20, No. 6, April, 1943, pp. 115-141.)
663	9524	G.B. ...	...	*Flexibility in Detail Production.* (I. Cohen, Machinery, Vol. 62, No. 1,592, 15/4/43, pp. 408-409.)
664	9560	G.B. ...	...	*Time and the Production of Mechanisms.* (Engineer, Vol. 175, No. 4,555, 30/4/43, pp. 342-344.)
665	9706	India	...	*Indian War Shops.* (J. R. Custer, Autom. Ind., Vol. 87, No. 6, 15/9/42, pp. 26-28.)

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666	9710	U.S.A. ...	*Pierce Governor Co. Surmounts Production Problems Due to War.* (J. Geschelin, Autom. Ind., Vol. 87, No. 6, 15/9/42, pp. 36-45.)
667	9768	G.B.	*Problems of Shift Working in a General Engineering Factory.* (J. Inst. Prod. Engs., Vol. 22, No. 2, Feb., 1943, pp. 41-59.)
668	9773	U.S.A. ...	*War Production (General Motor Corp.).* (Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 30-33 and 64.)
			Research and Training.
669	8971	G.B.	*A Survey of Selection and Allocation for Engineering Occupations.* (F. Holliday, J. Inst. Prod. Engs., Vol. 22, No. 3, March, 1943, pp. 103-136.)
670	8972	G.B.	*The Young Production Engineer—His Training and Prospects (with Discussion).* (J. D. Scaife and F. P. Liebert, J. Inst. Prod. Eng., Vol. 22, No. 3, March, 1943, pp. 69-102.)
671	9133	U.S.A. ...	*Research and Patents.* (R. E. Wilson, Ind. and Eng. Chem. (Ind. Ed.), Vol. 35, No. 2, Feb., 1943, pp. 177-185.)
672	9136	U.S.A. ...	*What is Research?* (L. T. Work, Ind. and Eng. Chem. (Ind. Ed.), Vol. 35, No. 2, Feb., 1943, pp. 221-222.)
673	9137	U.S.A. ...	*Research Accounting.* (D. H. Sheehan and F. J. Curtis, Ind. and Eng. Chem. (Ind. Ed.), Vol. 35, No. 2, Feb., 1943, pp. 225-226.)
674	9269	G.B.	*Industrial Research in Great Britain.* (Mech. World, Vol. 113, No. 2,928, 12/2/42, pp. 180-181.)
675	9297	G.B.	*Co-operative Research in the Metal Industries.* (H. Moore, Engineering, Vol. 155, No. 4,031, 16/4/43, pp. 315-316.)
676	9299	G.B.	*The Chemical Engineer in Reconstruction.* (C. S. Garland, Engineering, Vol. 155, No. 4,031, 16/4/43, pp. 316-317.)
677	9432	U.S.A. ...	*Visual Aids for Mechanical Training.* (E. S. Metcalfe, Aviation, Vol. 42, No. 1, pp. 269, 347, Jan., 1943.)
678	9527	G.B.	*Co-operative Research in the Metal Industries.* (H. Moore, J. Inst. Metals, Vol. 69, No. 3, March, 1943, pp. 93-108.)
679	9562	G.B.	*The Sigmund Apprentice Training Scheme.* (Engineer, Vol. 175, No. 4,555, 30/4/43, pp. 348-349.)
680	9593	U.S.A. ...	*Standardisation—Work and Procedure of the U.S. Aeronautical Board.* (Airc. Prod., Vol. 5, No. 55, May, 1943, p. 218.)
681	9772	U.S.A. ...	*Caterpillar Tractor Co. Research in Vital Metals.* (Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 25 and 70-71.)
			Aircraft Production.
682	9146	U.S.A. ..	*Lockheed Production.* (Flight, Vol. 43, No. 1,790, 15/4/43, pp. 398-399.)
683	9166	U.S.A. ..	*America's Aircraft Industry.* (Aeroplane, Vol. 64, No. 1,663, 9/4/43, p. 409.)

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684	9185	G.B. ...	.	*Aircraft Production.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, pp. 31-32.)
685	9267	G.B. ...	...	*Power Plant and Works Equipment.* (Mech. World, Vol. 113, No. 2,928, 12/2/43, p. 167.)
686	9338	U.S.A.	...	*S.A.E. Manual of Aircraft Engine Drafting Room Practice (Review).* (J.S.A.E., Vol. 51, No. 3, March, 1943, p. 22.)
687	9346	U.S.A.	..	*The Effect of 1943 Aircraft Production on the War.* (J. A. Ward, Aero Digest, Vol. 42, No. 2, pp. 83-86, 285, 348-349, Feb., 1943.)
688	9354	U.S.A.	...	*Production of Tapered Landing Gear Tubing.* (J. P. Dods, Aero Digest, Vol. 42, No. 2, pp. 149-156, 348, Feb., 1943.)
689	9358	U.S.A.	...	*Production of Packard Merlin.* (F. M. Reck, Aero Digest, Vol. 42, No. 2, pp. 164-168, 303-305, Feb., 1943.)
690	9431	U.S.A.	...	*Good Testing Simplifies Production of Flying Fortresses.* (B. K. Bucey, Aviation, Vol. 42, No. 1, pp. 107-111, 221, Jan., 1943.)
691	9441	U.S.A.	...	*Salvage of Damaged Propellers at Hamilton Standard Propellers Division.* (Aviation, Vol. 42, No. 1, p. 165, Jan., 1943.)
692	9586	Canada	...	*Producing Aircraft Instruments in Canada.* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, pp. 87-92.)
693	9591	U.S.A.	...	*Vega Methods for Ventura Assembly.* (Airc. Prod., Vol. 5, No. 55, May, 1943, pp. 207-210.)
694	9594	G.B. ...	...	*Aircraft Sheet Metal Work (Production of Equipment for Bristol Engines).* (W. E. Goff, Airc. Prod., Vol. 5, No. 55, May, 1943, pp. 219-229.)
695	9599	Canada	...	*Canadian Mosquito Production (Photograph).* (Airc. Prod., Vol. 5, No. 55, May, 1943, pp. 243.)
696	9621	U.S.A.	...	*Ford Methods for Grinding Cylinder Barrels (Reduction in Grinding Time).* (Airc. Prod., Vol. 5, No. 55, May, 1943, p. 248.)
697	9623	G.B. ...	...	*Engraving for the Aircraft Industry.* (Airc. Prod., Vol. 5, No. 55, May, 1943, pp. 249-251.)
698	9738	Canada	...	*Step-by-Step Overhaul of Aircraft.* (Canadian Aviation, Vol. 15, No. 8, Aug., 1942, pp. 34-35 and 76.)
699	9739	Canada	...	*"Strip to the Bones" Overhaul in Winnipeg Aircraft Plant.* (Canadian Aviation, Vol. 15, No. 8, Aug., 1942, pp. 36-37 and 76.)
700	9743	Canada	...	*Monorail Conveyor Speeds Output of Fuselages.* (E. P. Kennedy, Canadian Aviation, Vol. 15, No. 8, Aug., 1942, pp. 60 and 64.)
701	9748	U.S.A.	...	*Stinson-Built Planes for U.S. Army Liaison Work.* (Autom. Ind., Vol. 87, No. 11, 1/12/42, p. 25.)
702	9757	U.S.A.	...	*Propellers in the Making (Nash-Kelvinator Plant).* (J. Geschelin, Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 20-25, 72-74.)
703	9774	G.B. ...	...	*Spitfire V Fighter in Production.* (Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 34-37 and 72.)

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704	9775	G.B. ...	... *Production Equipment for Rolls Royce Engines.* (Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 38-39.)
			Other War Material Production.
705	9046	U.S.A.	... *S.A.E. War Production Meeting, Jan., 1943.* (*Digests of Papers on American Combat Vehicles, Steel Cartridge Cases, Surface Finish in Guns and Shell Manufacture.*) (J.S.A.E., Vol. 51, No. 2, Feb. 10, 1943, pp. 57-61.)
706	9426	U.S.A.	... *List of Manufacturing Firms in U.S.A.* (*Separate Supplement*). (Metal Progress, Vol. 43, No. 1, pp. C1-C63, Jan., 1943.)
707	9482	Japan	... *Japanese Machine Tool Production and New Method of Producing Aluminium.* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 445.)
708	9520	G.B. ...	... *The Production of Automatic Pistols.* (Machinery, Vol. 62, No. 1,592, 15/4/43, pp. 393-400.)
709	9705	U.S.A.	... *Production of Jeep Shells and Forgings.* (J. Geschelin, Autom. Ind., Vol. 87, No. 6, 15/9/42, pp. 20-25.)
710	9954	S. Africa	... *South African War Industry* (*Tanks, Guns, etc.*). (Engineer, Vol. 175, No. 4,552, 9/4/43, p. 296.)
			Special Methods.
711	9060	U.S.A.	... *Production Applications of Flash Welding* (*Digest*). (R. Milmore, J.S.A.E., Vol. 51, No. 2, Feb., 10, 1943, p. 73.)
712	9078	U.S.A.	... *The Place in Spot Welding and Design and Production of Aircraft* (*Digest*). (G. S. Mikhalapov, J.S.A.E., Vol. 50, No. 11, Nov., 1942, p. 61.)
713	9266	G.B. ...	... *Weld Forging—an Aid to Production.* (J. Winning, Mech. World, Vol. 113, No. 2,928, 12/2/43, pp. 159-162.)
714	9362	U.S.A.	... *Arc Welding Aircraft Structures.* (W. S. Evans, Aero Digest, Vol. 42, No. 2, pp. 200-210, 355-357, Feb., 1943.)
715	9080	U.S.A.	... *Template Duplication by Dry Offset Printing.* (W. A. Collins and J. T. Barnes, J.S.A.E., Vol. 50, No. 11, Nov., 1942, p. 61.)
716	9107	G.B. ...	... *Core Sand Reclamation* (*Wright Production*). (W. A. Phair, Metal Industry, Vol. 62, No. 16, 16/4/43, pp. 246-248.)
717	9351	U.S.A.	... *Lofting Problems of Streamline Bodies* (*X*). (C. M. Hartley, R. A. Liming, Aero Digest, Vol. 42, No. 2, pp. 130-136, Feb., 1943.)
718	9367	U.S.A.	... *Details of Duramold Fabrication.* (S. M. Fairchild, Aero Digest, Vol. 42, No. 2, pp. 232-239.)
719	9405	U.S.A.	... *Forming Propeller Shanks by Induction Heating.* (Aero Digest, Vol. 42, No. 2, pp. 314-315, Feb., 1943.)
720	9433	U.S.A.	... *Theory and Technique of Perspective Projection* (*Pt. I*). (G. F. Bush, Aviation, Vol. 42, No. 1, pp. 118-120, 125, 349, Jan., 1943.)
721	9436	U.S.A.	... *Drop Hammer Technique.* (C. J. Frey and S. S. Kogut, Aviation, Vol. 42, No. 1, pp. 143-149, Jan., 1943.)

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722	9442	U.S.A. ...	*Wiring Board Speeds Harness Assembly.* (Aviation, Vol. 42, No. 1, p. 165, Jan., 1943.)
723	9446	U.S.A. ...	*Metallizing for Better Maintenance.* (L. E. Kunkler, Aviation, Vol. 42, No. 1, pp. 231-235, 342-344, Jan., 1943.)
724	9503	G.B.	*Clamping Cylindrical Components.* (Mech. World, Vol. 113, No. 2,937, 16/4/43, pp. 403-406.)
725	9507	G.B.	*Easily Made Duct Bends.* (Mech. World, Vol. 113, No. 2,937, 16/4/43, p. 418.)
726	9515	G.B.	*Improving Hack Saw Machine Output.* (Machinery, Vol. 62, No. 1,591, 8/4/43, p. 373.)
727	9523	G.B.	*The Three-Circle Problem (for Cam Design).* (Machinery, Vol. 62, No. 1,592, 15/4/43, pp. 404-407.)
728	9747	U.S.A. ...	*Ford War Plant Facilities Straight-Line Production.* (J. Geschelin, Autom. Ind., Vol. 87, No. 11, 1/12/42, pp. 19-24.)
729	9756	U.S.A. ...	*New Quenching Method Used at Ford Armourplate Plant.* (Autom. Ind., Vol. 87, No. 11, 1/12/43, p. 52.)
730	9770	G.B.	*Report on De-Skilling and Up-Grading for Machine Setting.* (The Technical Bulletin, No. 21,, Feb., 1943, pp. 211-221.) (J. Inst. Prod. Engs., Vol. 21, No. 2, Feb., 1943.)
			Special Equipment.
731	9011	Germany ...	*Simple Device for Checking Curvature of Sheet Metal Profiles Against Lofting Contours.* (Junkers, Flugsport, Vol. 35, No. 7, 31/3/43, pp. 81-82.)
732	9588	U.S.A. ...	*Automatic Spray Gun for Painting Aircraft Parts.* (Canadian Aviation, Vol. 16, No. 2, Feb., 1943, pp. 99-100.)
733	9750	U.S.A. ...	*Modern Equipment at the Ramsey Plant (Aviation Piston Rings Manufacture).* (Autom. Ind., Vol. 87, No. 11, 1/12/42, pp. 34-37.)
734	9755	U.S.A. ...	*New Production Equipment for Aircraft Assembly.* (Autom. Ind., Vol. 87, No. 11, 1/12/43, p. 48.)
735	9765	U.S.A. ...	*New Production Equipment.* (Autom. Ind., Vol. 87, No. 12, 15/12/42, pp. 44-45.)
736	9771	U.S.A. ...	*Clark Manufacturing Facilities (Fabrication of Axle Housings).* (J. Geschelin, Autom. Ind., Vol. 87, No. 5, 1/9/42, pp. 20-24 and 67.)
			Inspection and Quality Control.
737	9208	G.B.	*Dimensional Tolerances and Quality Control.* (J. W. White, Machinist, Vol. 86, No. 46, 27/2/43, pp. 288 E-289 E.)
738	9282	G.B.	*Universal Dial Gauges for Toolshop Inspection.* (J. Sci. Insts., Vol. 20, No. 2, Feb., 1943, p. 34.)
739	9450	G.B.	*Quality Assurance Through Sampling Inspection—I.* (H. Rissik, Engineer, Vol. 175, No. 4,554, 23/4/43, p. 334.)
740	9518	U.S.A. ...	*Fluorescent Tubular Lighting for Inspection Work.* (Machinery, Vol. 62, No. 1,591, 8/4/43, p. 380.)

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741	9561	G.B. ...	*Quality Assurance Through Sampling Inspection.* (Engineer, Vol. 175, No. 4,555, 30/4/43, pp. 346-347.)
742	9736	G.B. ...	*Quality Control in Production Engineering (contd.).* (H. Rissik, Airc. Eng., Vol. 15, No. 169, March, 1943, pp. 85-90.)
			Scrap, Foundries.
743	9090	G.B. ...	*South African Steel Works Progress.* (Engineer, Vol. 175, No. 4,553, 16/4/43, p. 315.)
744	9094	S. America ...	*Scrap Metal from South America.* (Engineering, Vol. 155, No. 4,030, 9/4/43, pp. 285-286.)
745	9361	U.S.A.	*Buik's Cylinder Head Foundry.* (Aero Digest, Vol. 42, No. 2, pp. 192-199, Feb., 1943.)
746	9624	U.S.A.	*Scrap Segregation.* (Airc. Prod., Vol. 5, No. 55, May, 1943, p. 251.)
747	9735	G.B. ...	*Ministry of Supply Scheme for Segregation of Alloy Steel Scrap.* (Airc. Eng., Vol. 15, No. 169, March, 1943, p. 84.)
748	9769	G.B. ...	*Visit to A. Herbert, Ltd., Mechanised Foundry. (The Problems of Foundries in Wartime.)* (W. G. Morgan, J. Inst. Prod. Engs., Vol. 22, No. 2, Feb., 1943, pp. 60-67.)
			Women in Industry.
749	9145	Germany	*Female Labour in Germany.* (Flight, Vol. 43, No. 1,790, 15/4/43, p. 397.)
750	9211	G.B. ...	*Dexterity Tests for Women Workers.* (Machinist, Vol. 86, No. 46, 27/2/43, pp. 1,280-1,281.)
751	9324	G.B. ...	*The Employment and Payment of Women Engineering Workers.* (J. McHale, Mech. World, Vol. 113, No. 2,935, 2/4/43, pp. 347-349.)
752	9660	G.B. ...	*Women in War Production Jobs.* (Prod. and Eng. Bull., Vol. 2, No. 5, March, 1943, pp. 225-229.)
753	9665	U.S.A.	*Women in the Machine Tool Industry.* (W. E. Whipp, Machinist, Vol. 86, No. 44, 13/2/43, pp. 1,213-1,215.)
			General Welfare of Workers.
754	9519	G.B. ...	*Protecting the Skin of Industrial Workers.* (Machinery, Vol. 62, No. 1,591, 8/4/43, p. 383.)
755	9598	G.B. ...	*Air Conditioning.* (F. H. Slade, Airc. Prod., Vol. 5, No. 55, May, 1943, pp. 236-240.)
756	9659	G.B. ...	*Heating and Ventilating War Factories.* (Prod. and Eng. Bull., Vol. 2, No. 5, March, 1943, pp. 217-224.)
			Transport.
			Tanks, Trucks, and Rail Transport.
757	8973	U.S.A.	*"Flexitanks" for Hauling Petroleum.* (Nat. Pet. News, Vol. 35, No. 6, 10/2/43, p. 4.)
758	9091	G.B. ...	*Modern Locomotive Superheating (Part II).* (B. Reed, Engineer, Vol. 175, No. 4,553, 16/4/43, pp. 304-305.)
759	9162	Germany	*German Truck with Special Crane for Maintenance Work (Photo).* (Flight, Vol. 43, No. 1,789, 8/4/43, p. 368.)

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760	9310	U.S.A. ...	*Tubeless Tyres.* (Nat. Pet. News, Vol. 35, No. 4, 22/1/43, p. 9.)
761	9438	U.S.A. ...	*Maintenance of Battery-Powered Plant Trucks.* (F. L. Sahlmann, Aviation, Vol. 42, No. 1, pp. 155-158, 323, Jan., 1943.)
762	9646	U.S.A. ...	*Army's New Light Tank M5 (Photograph).* (Army Ordnance, Vol. 24, No. 137, March-April, 1943, p. 308.)
763	9651	U.S.A. ...	*American Tanks in Battle.* (G. L. Scott, Army Ordnance, Vol. 24, No. 136, Jan.-Feb., 1943, pp. 67-71.)
764	9778	U.S.S.R. ...	*Soviet Sound Truck on Eastern Front.* (Autom. Ind., Vol. 87, No. 5, 1/9/42, p. 47.)
765	9951	G.B.	*Modern Locomotive Superheating (Part I).* (B. Reed, Engineer, Vol. 175, No. 4,552, 9/4/43, pp. 283-287.)
			Ship Propulsion.
766	9184	G.B.	*Marine Gas Engines and Producers.* (Trade and Engineering Times, Vol. 52, No. 949, March, 1943, p. 30.)
767	9326	G.B.	*Marine Engine Torque and Propeller Performance.* (Mech. World, Vol. 113, No. 2,932, 12/3/43, p. 272.)
768	9451	G.B.	*The Fouling of Ships.* (G. D. Bengough and V. G. Shepheard, Engineer, Vol. 175, No. 4,554, 23/4/43, pp. 327-329.)
769	9452	G.B.	*British Prefabricated Tugs.* (Engineer, Vol. 175, No. 4,554, 23/4/43, pp. 336-338.)
770	9492	U.S.A. ...	*Substitute Electrical Materials for Naval Service.* (G. Huey, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 25-43.)
771	9494	U.S.A. ...	*The Hull and its Screw Propeller. Pt. V, Cavitation.* (E. A. Stevens, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 72-101.)
772	9497	U.S.A. ...	*Marine Gears and Their Maintenance (from Nautical Gazette, Sept., 1942).* (C. R. Waller, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 125-131.)
773	9576	G.B.	*The Corrosion and Fouling of Ships.* (G. D. Bengough and V. G. Shepheard, Engineering, Vol. 155, No. 4,033, 30/4/43, pp. 358-360.)

Wireless and Electricity.

Wireless and Radio Shielding.

774	9066	U.S.A. ...	*Storage Battery Performance at Low Temperatures (Digest).* (J. H. Little and R. A. Daily, J.S.A.E., Vol. 51, No. 2, Feb., 1943, pp. 74-75.)
775	9238	U.S.A. ...	*Radio and Fleet Aviation.* (F. Akers, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 165-166.)
776	9285	G.B.	*Receiver Input Circuits (Abstracts and References).* (R. E. Burgess, Wireless Engineer, Vol. 20, No. 233, Feb., 1943, pp. 66-76.)

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777	9703	U.S.A.	...	*Aircraft Engine Radio Shielding.* (R. W. Randolph, S.A.E., Nat. Aeronautics Meeting, March, 1942.)
778	9968	G.B. ...	...	*Wireless Engineer (Abstracts and References).* (Compiled by the Radio Research Board, May, 1943.)

Electricity.

779	9007	G.B. ...	...	*Measurement of Shock Electric Wave Lengths.* (Nature, Vol. 151, No. 3,828, 13/3/43, pp. 313-314.)
780	9130	U.S.A.	...	*Fibre Conduit for the Installation of Electrical Cables (Bermica).* (Ind. and Eng. Chem., Vol. 21, No. 4, 25/2/43, p. 277.)
781	9271	G.B. ...	...	*Voltage Fluctuations in Resisters.* (N. R. Campbell and V. G. Francis, Phil. Mag., Vol. 34, No. 231, April, 1943, pp. 259-265.)
782	9284	G.B. ...	...	*Abstracts and References, Electrical Standards and Standardisation.* (W. H. F. Griffiths, Wireless Engineer, Vol. 20, No. 234, March, 1943, pp. 109-126.)
783	9302	G.B. ...	...	*Static Electrical Charges.* (Engineering, Vol. 155, No. 4,032, 23/4/43, p. 352.)
784	9495	U.S.A.	...	*The Basic Concepts of Current Flow Along Conductors and in Tubes, Circuits, Radiation, etc., for Electromagnetic Waves at High Frequencies. (From General Electric Review, Oct., 1942.)* (S. Ramo, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 103-104.)
785	9499	U.S.A.	...	*Transmission of Power in Compressed Gas Dielectric Cables (for Insulating Purposes). (J. Frank. Inst., Sept.-Oct., 1942.)* (H. M. Hobart, J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 144-169.)
786	9502	U.S.A.	...	*Eliminating Bouncing and Chattering in Electrical Relays (Hollow Relay Contacts Partly Filled with Powder). (From Metals and Alloys, Sept., 1942.)* (J. Am. Soc. Nav. Engs., Vol. 55, No. 1, Feb., 1943, pp. 181-182.)
787	9662	G.B. ...	...	*Voltage Surges Caused by Contactor Coils.* (J. R. Taylor and C. E. Randall, J. Inst. Elect. Engs., Vol. 90, Pt. 1, No. 26, Feb., 1943, pp. 94-95.)
788	9663	G.B. ...	...	*Fluctuations in Space-Charge—Limited Currents.* (D. A. Bell, J. Inst. Elect. Engs., Vol. 90, Pt. 1, No. 26, Feb., 1943, p. 95.)

Heat Transfer and Velocity of Sound Determination.

789	9038	U.S.A.	...	*Heat Transfer and Fluid Resistance in Ljungstrom Regenerative Type of Air Preheaters.* (H. Karlson and S. Holm, Trans. A.S.M.E., Vol. 65, No. 1, Jan., 1943, pp. 61-72.)
790	9270	G.B. ...	...	*The Determination of Velocity of Sound by the Employment of Closed Resonators and the Hot Wire Microphone.* (W. S. Tucker, Phil. Mag., Vol. 34, No. 231, April, 1943, pp. 217-235.)

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791	9294	G.B. ...	... *Modern Developments in Heating.* (F. Buckingham, Engineering, Vol. 155, No. 4,031, 16/4/43, p. 305.)
792	9296	G.B. ...	... *Pioneers of Refrigeration.* (Engineering, Vol. 155, No. 4,031, 16/4/43, p. 314.)
793	9300	G.B. ...	... *Modern Developments in Heating.* (F. Buckingham, Engineering, Vol. 155, No. 4,032, 23/4/43, pp. 324-325.)
794	9339	G.B. ...	... *Principles of Pressure Water Cooling.* (J. E. Ellor, J.S.A.E., Vol. 51, No. 3, March, 1943, pp. 65-68 and 77.)
795	9564	G.B. ...	... *Infra-Red Lamp Heating Industry.* (Engineer, Vol. 175, No. 4,555, 30/4/43, p. 355.)
796	9570	G.B. ...	... *Modern Developments in Heating (contd.).* (F. Buckingham, Engineering, Vol. 155, No. 4,033, 30/4/43, pp. 344-345.)
			Photography.
797	9234	U.S.A.	... *Photography in U.S. Naval Air Arm.* (L. A. Pope, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 132-134 and 275.)
798	9480	Germany	... *New German High Speed Camera.* (Flight, Vol. 43, No. 1,792, 29/4/43, p. 445.)
799	9657	U.S.A.	... *Simplified Spark Photography ("Sparkograph" Machine).* (Army Ordnance, Vol. 24, No. 136, Jan.-Feb., 1943, pp. 123-125.)
			Meteorology.
800	9272	G.B. ...	... *The Separation of Electricity in Clouds.* (G. C. Simpson, Phil. Mag., Vol. 34, No. 231, April, 1943, pp. 285-287.)
801	9737	Canada	... *Astral Aircraft Navigation.* (J. W. Melson, Canadian Aviation, Vol. 15, No. 8, Aug., 1942, pp. 47-51, 78-80 and 84.)
			Aviation Medicine.
802	8990	Germany	... *New Results and Problems in Medical Stratosphere Research.* (*R.T.P. Trans. No.* 1,637.) (H. Strughold, J. Roy. Aeron. Soc., Vol. 47, No. 388, April, 1943, pp. 113-117.)
803	9236	U.S.A.	... *Aviation Medicine.* (L. D. Carson, Flying and Pop. Av., Vol. 32, No. 2, Feb., 1943, pp. 160-162 and 232-234.)
804	9675	Germany	... *New German Research Institute of Aviation Medicine.* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 257.)
805	9681	G.B. ...	... *Directorate of Air Force Welfare.* (Flight, Vol. 43, No. 1,785, 11/3/43, p. 262.)
			Mathematics and Physics.
806	9006	U.S.S.R.	... *Theoretical Physics in the U.S.S.R. during the Last 25 Years.* (D. Ivanenko, Nature, Vol. 151, No. 3,828, 13/3/43, pp. 293-294.)
807	9096	G.B. ...	... *Coriolis Theorem.* (C. E. Stratton, Engineering, Vol. 155, Vol. 4,030, 9/4/43, p. 294.)

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808	9403	U.S.A. ...	*The Audible and the Ether Spectrum.* (Metal Progress, Vol. 42, No. 4, Oct., 1942, p. 714.)
809	9435	U.S.A. ...	*How to Fair Lines by Graphical Calculus (Mathematical Lofting).* (D. Madsen, Aviation, Vol. 42, No. 1, pp. 136-140, 349-350, Jan., 1943.)