

leaving the wick still attached to each candle and hanging centrally in the mould. Another filling is now applied, and when this is set, the wicks are severed by passing a knife between the top of the mould and the underside of the clamps. The machine is now unloaded by removing all the clamps filled with candles, and again replacing them, when empty, in position on the machine to receive the next batch, and the operations repeated. All this looks a very simple unskilled job of work, and so it is; but it is a well-thought-out job withal, and shows all the signs of the thoroughness usually associated with the planning of the skilled engineer.

Mention must also be made of various types of chain and belt conveyors made by this firm. Both fixed and portable conveyors are made in standard lengths of 12ft., or are specially designed to suit special circumstances and requirements. All portable conveyors are equipped with self-contained electric motors for driving the endless chain or belt. The fixed conveyors are adapted to be driven from the machine to which they are attached,

but in cases where conditions do not permit of this, a motor can always be fitted.

Belt, chain, or platform conveyors are very much in evidence in many factories, particularly where continuous production is the rule. They are always great savers of labour, time, and space, but in some instances they actually control the rate of production by the speed at which they are set to convey work from one operation to another. In some of the light industries where it is usual to pack the product in cartons ready for despatch, the conveyor has become practically essential to well-ordered production, because of the great numbers of containers and cartons that have to be handled to keep pace with the product leaving the machines. For instance it is only necessary to witness the rate at which tubes and containers are filled and sealed on some of the machines just considered to realise the confusion that might easily arise if adequate means were not provided for carrying the packets clear before the machine became buried beneath its own output.

(To be continued)

It may be noted that the bevel wheels which drive the reels are completely enclosed in dust-proof casings, the castings which form the covers acting as grease boxes, so that the gears are kept clean and are well lubricated. The ratchets are also enclosed in similar dustproof casings. In order to accommodate the machine to differing widths of rows adjustable road wheels have been provided. In addition to the new light-draught machine we have described the firm is also showing its well-known "Triumph" potato digger.

THE GENERAL ELECTRIC COMPANY, LTD.

As in previous years, The General Electric Company is well represented at the Show. Apart from its usual stand, it has supplied the equipment for the electric farm and a considerable amount of heavy cooking equipment for the restaurant services connected with the Show. We also noted one of the new G.E.C. floating electrode boilers, referred to later, on the stand of the Alfa-Laval Company, Ltd., where it provides the sterilising and hot water service connected with that firm's milking exhibit.

The main attraction on the G.E.C. stand itself is the 27ft. dairy sterilising chest—Fig. 5—which was entered in the class for the R.A.S.E. silver medal and has gained that award. It embodies in its design several new features which have been introduced following many years of experience of the service requirements of dairy sterilising plant. Quick steaming within a few minutes of switching on the current is ensured. Not only can utensils and bottles be sterilised in the cabinet, but, in addition, as will be seen from our illustration, a pressure steam jet is available for treating the churn stool, milking machine rubbers, milk pipe lines, &c., while hot water is available at any time when steaming is not in progress. A wide door has been adopted, which gives easy access to all parts of the chest from the front. The steam and hot water lever control is at the front of the chest, and an automatic water feed guards against possible burning out of electrodes. Particular care is taken to provide rust-free parts, and all the parts are carefully galvanised after they have been made and assembled.

Another item of interest is the floating electrode steam raiser, which, we are informed, is finding a

The Centenary Royal Show at Windsor

No. I

THE Annual Show of the Royal Agricultural Society of England, which this year is being held in the Great Park at Windsor, by special invitation of His Majesty the King, marks the Centenary of the Society. The Show opened on Tuesday, July 4th, and will close to-morrow. In point of fact, however, this year's Show is not the hundredth, as in the long history of the Royal Show there have been two breaks, one following an outbreak of cattle disease in 1866, and the other during the last two years of the War. The Jubilee Show of the Society was also held at Windsor in 1889 under singularly happy circumstances, and was a brilliant success. There is no doubt that the present Centenary Show, with His Majesty the King as its Patron and President and the Earl of Athlone as Deputy President, will be no less a

St. Edmunds, for a beet harvester. The Show is made exceptional by the inclusion of historical exhibits and displays to which we shall refer next week.

As in previous years we give in what follows short illustrated descriptions of some of the new implements and machines, together with some other items of engineering interest.

BAMFORDS, LTD.

Few firms are exhibiting a wider range of farm machinery than that which is to be seen on the stand of Bamfords, Ltd., of Uttoxeter. It includes haymaking and food preparing machinery, as well as manure distributors and harrows for grass land. The firm is also showing a group of its own oil and petrol engines, along with pumps and saw benches.

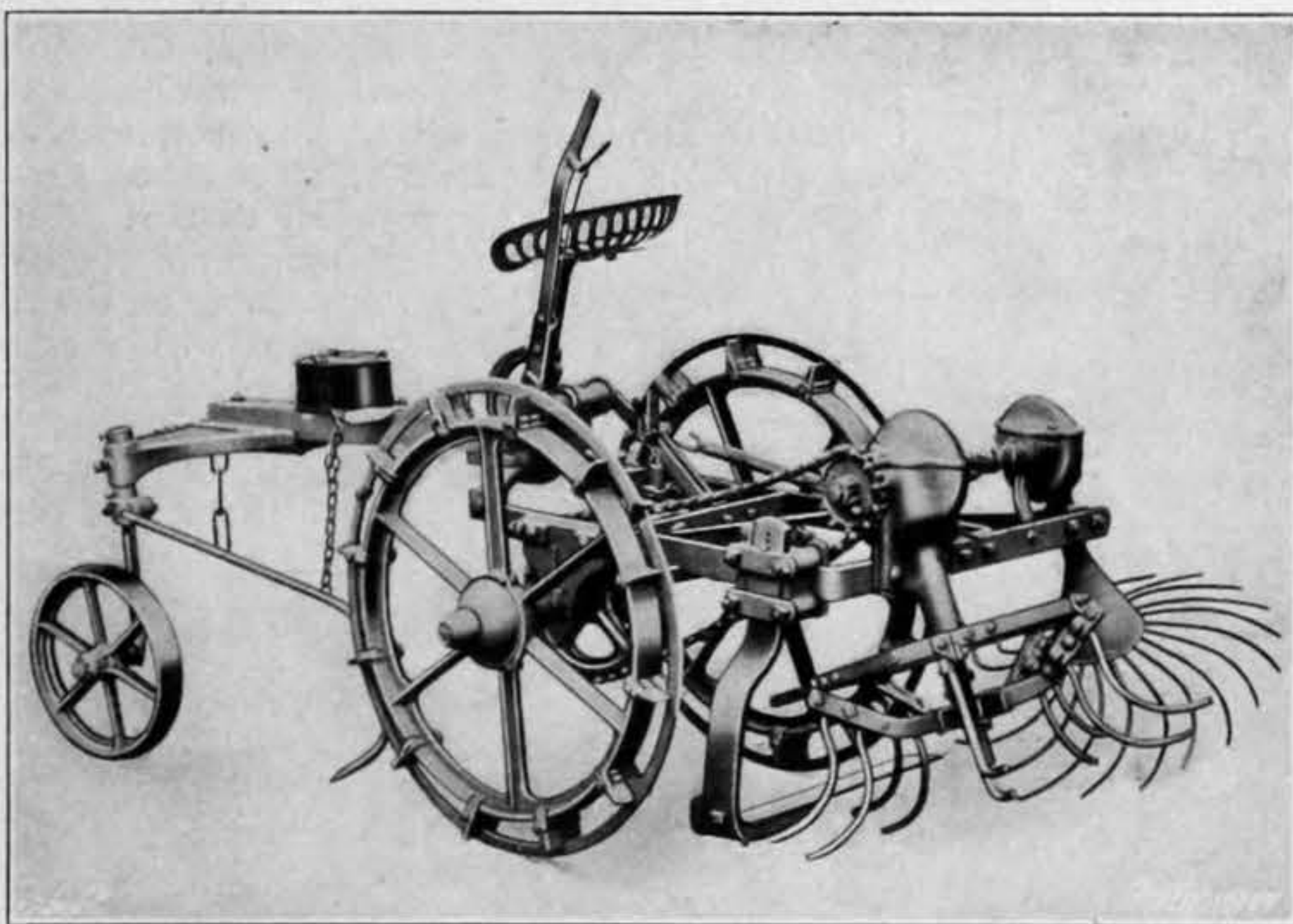
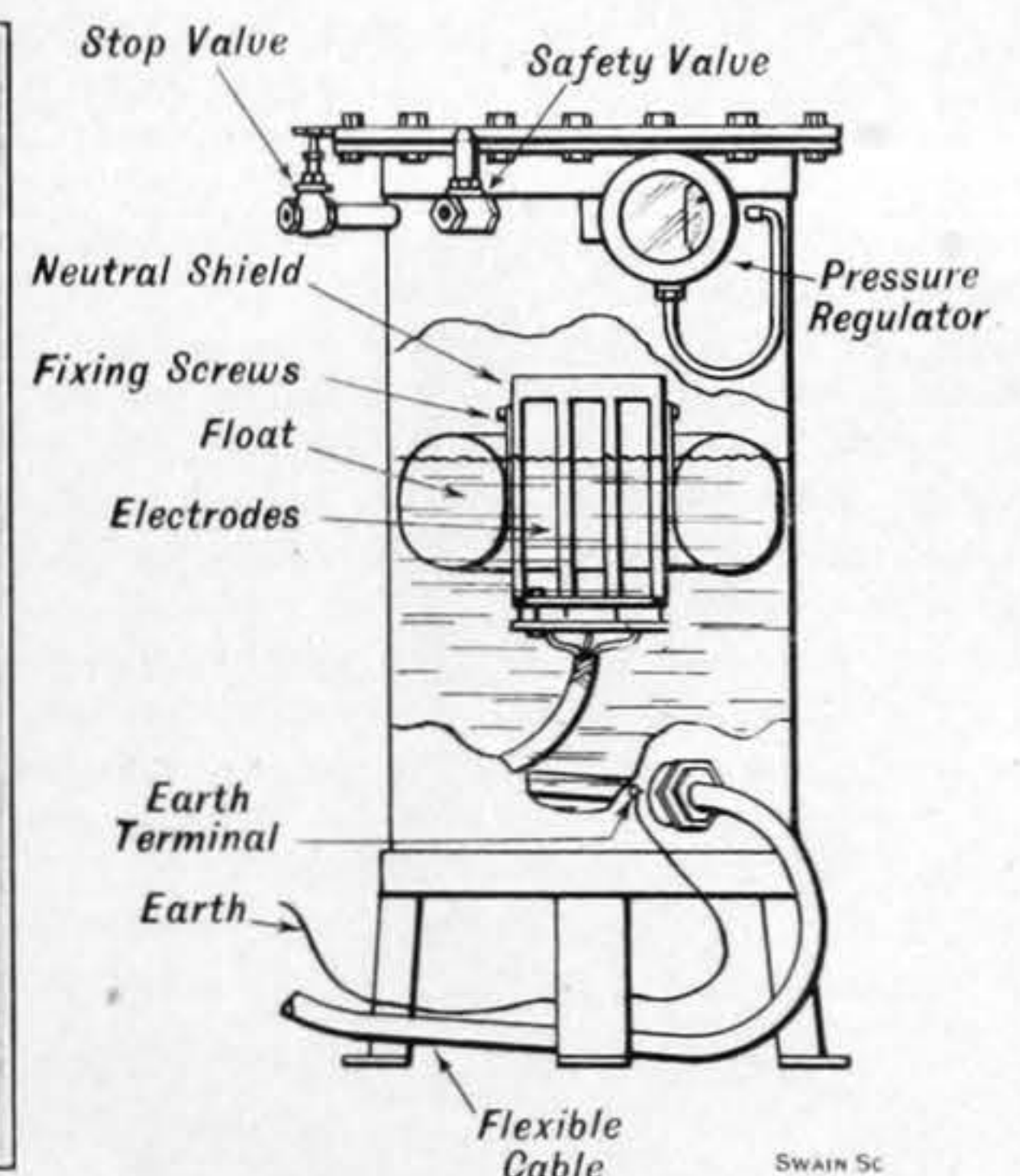
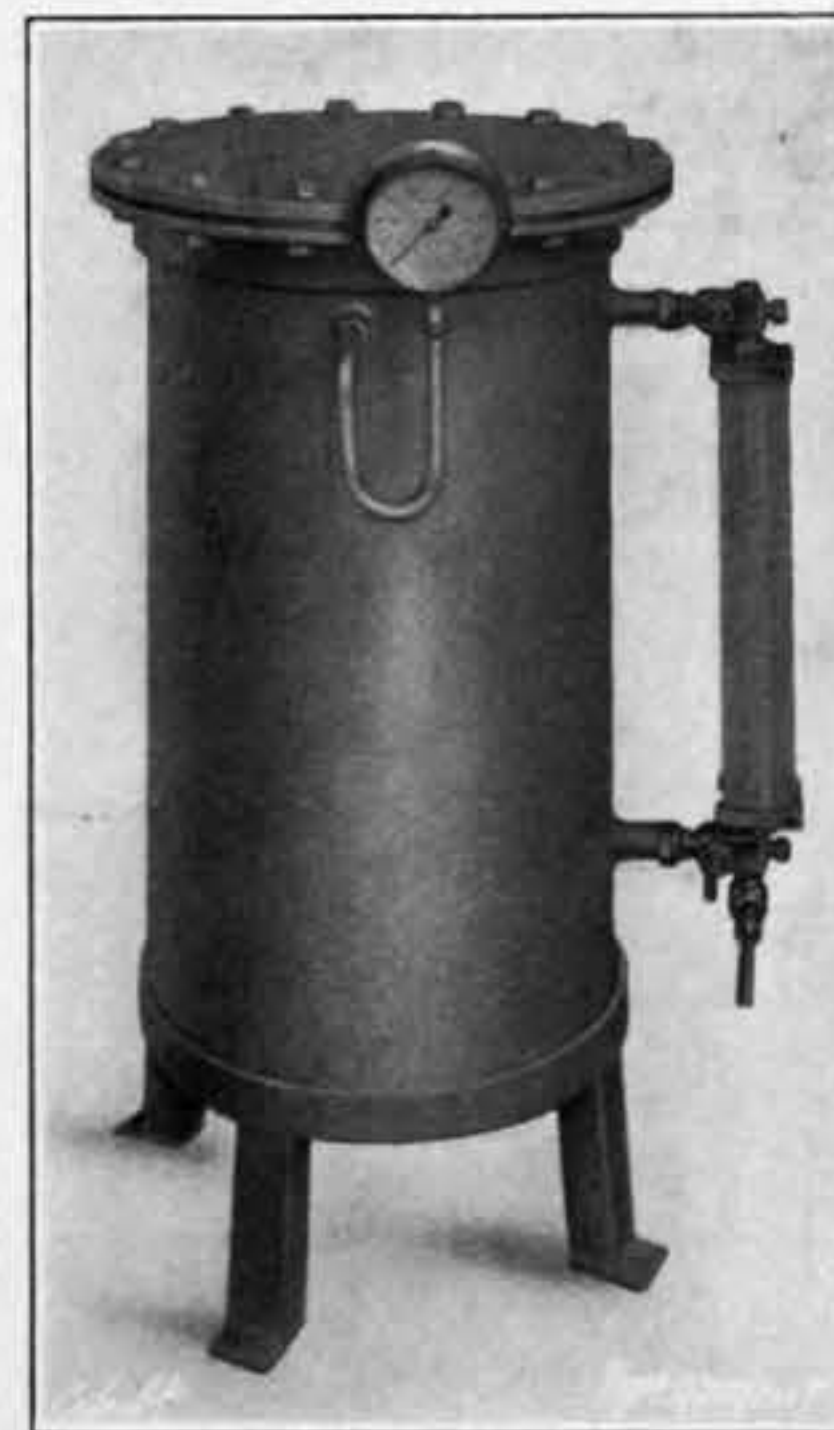


FIG. 1—LIGHT-DRAUGHT POTATO DIGGER—BAMFORD



FIGS. 2 AND 3—FLOATING ELECTRODE STEAM BOILER—G.E.C.

memorable occasion. In size, the 1939 Show is larger than those of recent years, and there are 4300ft. of shedding in the implement yard devoted to machinery exhibits, while the total number of stands in this section is 430.

If the interest in new developments in connection with agricultural machinery is to be gauged from the number of entries for the Society's Silver Medals for "New Implements for Agricultural or Estate Purposes," there is no lack of activity, for there are this year nine entries, which are representative of all sides of agricultural engineering. The judging of these exhibits is again in the able hands of Mr. Harold V. Blackstone, who is being assisted in his task by Mr. L. R. Bomford.

The Society's Silver Medals for new implements have been awarded to the Firestone Tyre and Rubber Company, Ltd., of Brentford, for a spade-grip tractor tyre; W. N. Nicholson and Son, Ltd., of Newark, for a combined swath-turner and side-rake; The General Electric Company, Ltd., of Kingsway, W.C., for an electric dairy sterilising chest; and Mr. W. M. Catchpole, of Stanton, Bury

We have chosen for description and illustration by the engraving and drawing reproduced in Figs. 1 and 4 the firm's new light-draught "XLI" pattern potato digger, which incorporates some novel technical features for which patents are pending. As will be seen from the engravings, the design which has been adopted is a very neat one, incorporating an all-steel frame for the fork reel, which has six sets of digging tines mounted on an inclined shaft. These tines, it will be noted, project downward and their points are curved away from the direction of rotation of the digger. The result is that they lift the crop gently and it is claimed that no bruising takes place. In order to remove the haulms, picker bars are also fitted on the periphery of the fork reel. The share, which is rigidly attached to the machine, raises the ridge and the fork reel, which is placed immediately behind it, gently sweeps the crop of potatoes on to the side reel. This acts as a sieve and removes the earth from the potatoes, which are deposited by the reel in even rows on the ground, ready for picking.

wide use in the dairy industry. As shown in Fig. 3, the boiler is of the vertical type with a removable top cover, giving access to the heater electrodes, which are formed by short lengths of iron pipe and can be adjusted in the floating body, which is covered by a neutral shield. A filling and drain cock, a pressure gauge, and a water gauge are provided. The boiler is connected up and the position of the floating electrodes is so adjusted that the current taken is about 90 per cent. of the desired maximum when the water boils. Should this not be possible with some kinds of water with the electrodes fully immersed, then the addition of a small amount of salt to the water will bring about the desired result. With the boiler filled with water to within 2in. of the top of the water gauge it will operate for about one to one and a-half hours without refilling. Other exhibits include a display of dairy equipment by Coldair, Ltd., an associated G.E.C. company, and various patterns of motors designed for farm work. On the horticultural side, in connection with a Crittall all-metal greenhouse, the G.E.C. is demonstrating

thermostatically controlled greenhouse heating, plant irradiation, and soil heating cables.

FORD MOTOR COMPANY, LTD.

The Fordson tractor made by the Ford Motor Company, Ltd., of Dagenham, Essex, has long been an important unit among British-produced tractors. This year, in addition to the agricultural tractors, and those of the land utility type fitted with either Dunlop, Goodyear, or Firestone tyres,

the front wheels. If desired, a single front wheel can be fitted. The pneumatic tyre is 9.00 by 10, or dual cast wheels 24in. diameter can be fitted. The rear wheels are fitted with 9.00 by 36 pneumatic tyres, or with steel wheels having a rim diameter of 50in., with spade lugs offset. The principal dimensions of this new tractor are:—Wheel base, 83.7in.; overall length, steel wheels 126.7in., pneumatic 125in.; overall height, with steel wheels 63.75in. and with pneumatic wheels

published in our issue of December 30th, 1938, we described the well-laid-out works in which this tractor is built and assembled. The appearance of the new tractor is different from that of the Ferguson-Brown tractor which was exhibited at last year's Royal Show. The pleasing appearance of the new machine may be judged from our engraving on page 14. Particularly noticeable is the uninterrupted understructure, which is useful in case of row crops, and discourages any accumulation of dirt. The chassis is of box section, and into it all the component parts which are built as a sub-assembly, are fitted. This, it is claimed, gives a degree of accessibility greater than that

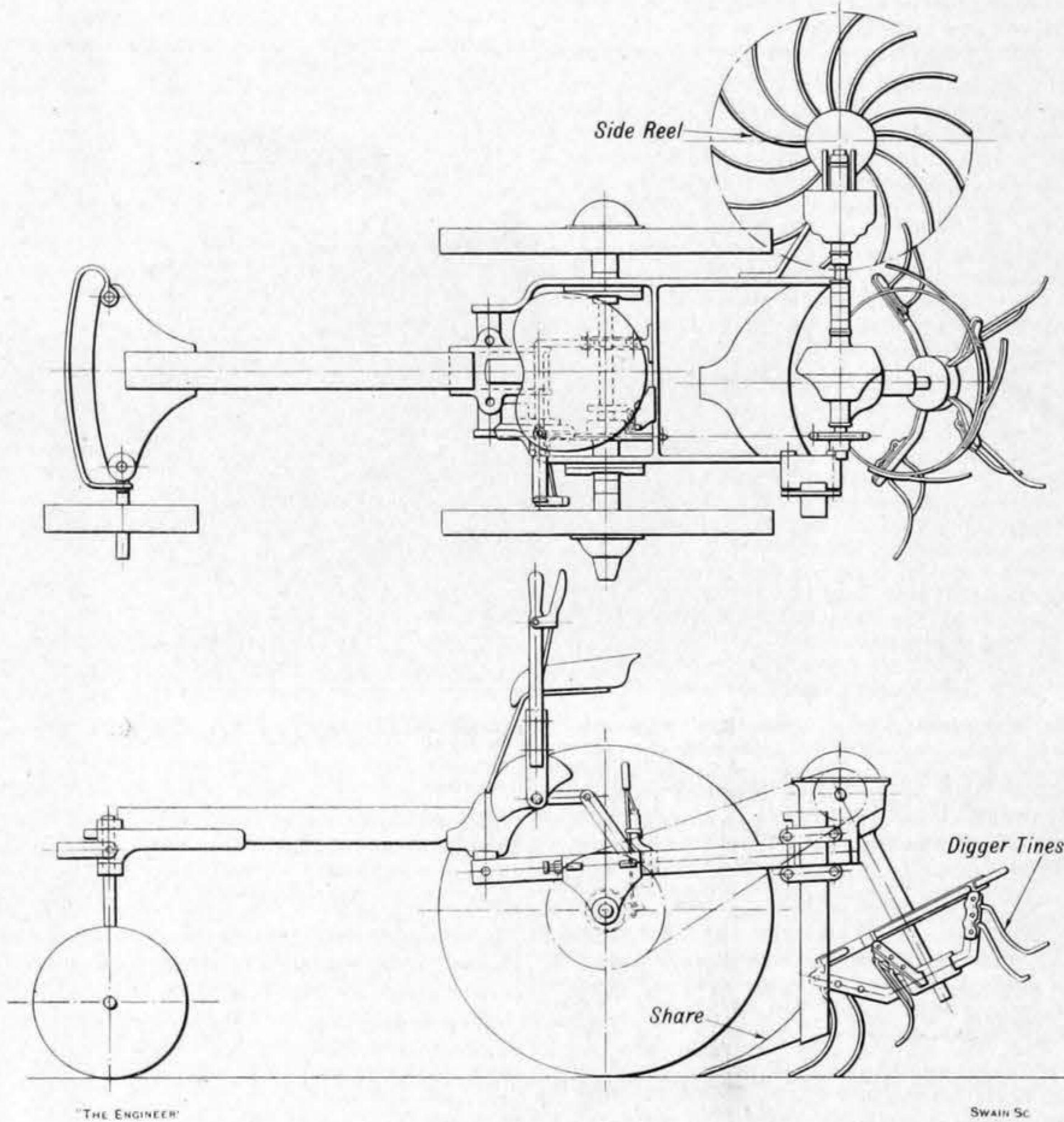


FIG. 4—POTATO DIGGER—BAMFORD

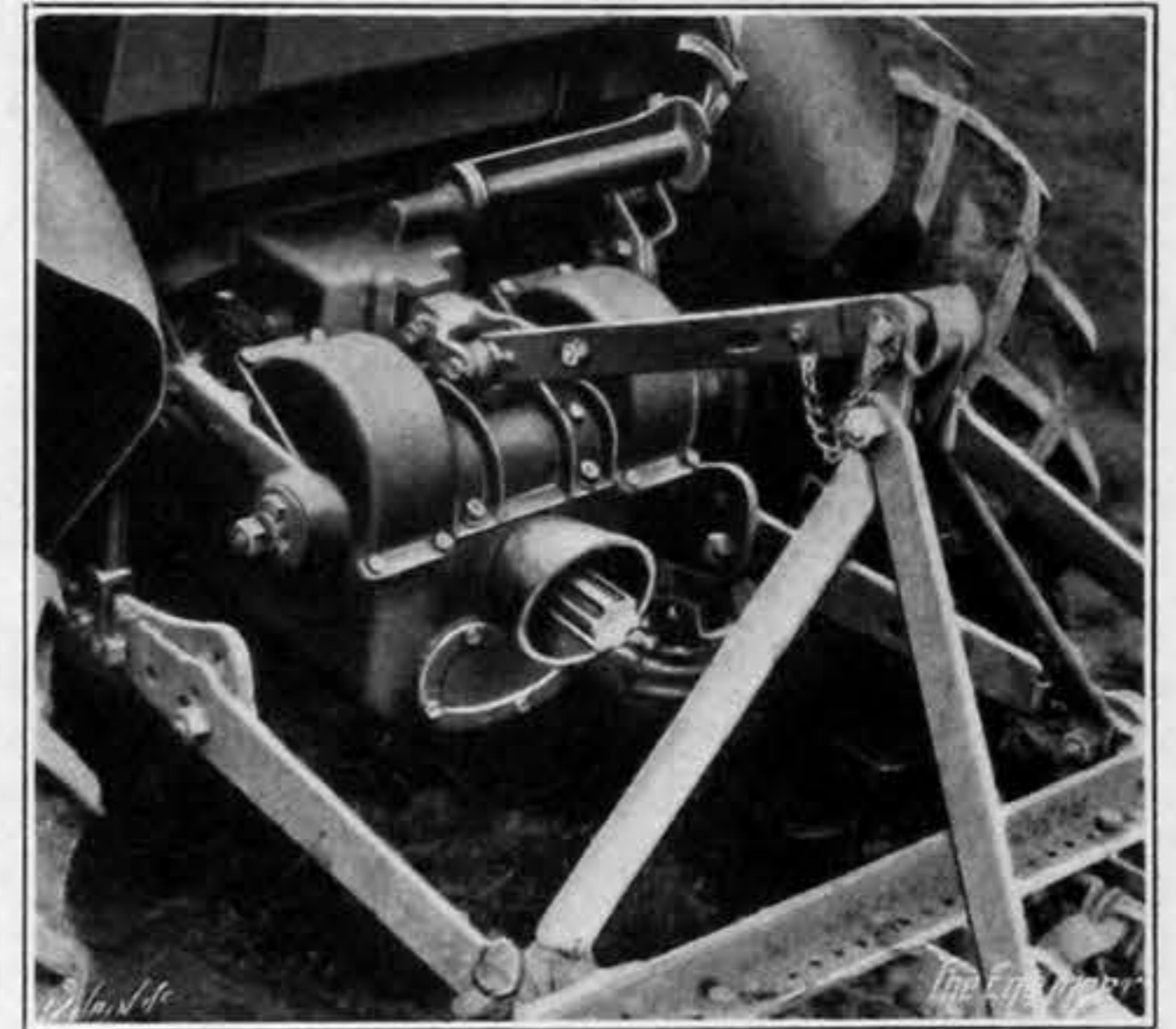


FIG. 6—HYDRAULIC REAR ATTACHMENT UNIT—DAVID BROWN

previously possible, and by means of hinged side doors all parts of the tractor are easy of access for inspection. We noted in particular the good view of the crop and implement which is to be obtained from the seat of the tractor, and the free leg room given. An interesting improvement is the provision of a special control lever near the back of the tractor, which allows the driver to inch-up when hitching up the tractor and the implement. As will be seen from the accompanying engravings (Figs. 6 and 7) there are two patterns of rear attachment. For ordinary implements a simple draw-bar of geometrical design is available, but if the hydraulic unit associated with Ferguson-Brown implements is preferred, it can be attached

there is shown the new Row crop tractor which we illustrate on page 14. It embodies in its design the standard Fordson power unit and transmission, but new features are the increased height to clear row crops, easily adjusted rear wheels, a completely new front wheel construction with a choice of single or double wheels, and a new type of steering with a worm gear enclosed in an oil bath and mounted on Timken roller bearings in the front axle housing. This housing, as our engraving shows,

62in. The rear wheels can be rapidly adjusted to suit the width of any normal row crop, and the inside minimum distance between the rear wheel spade lugs is 45in., while the inside maximum distance between the rear wheel spade lugs is 74½in. The standard speeds with special ratio transmission and 50in. steel wheels is low gear 1.85, intermediate 2.78, high 4.90, and reverse 1.40 m.p.h.

Models of this tractor fitted with various types

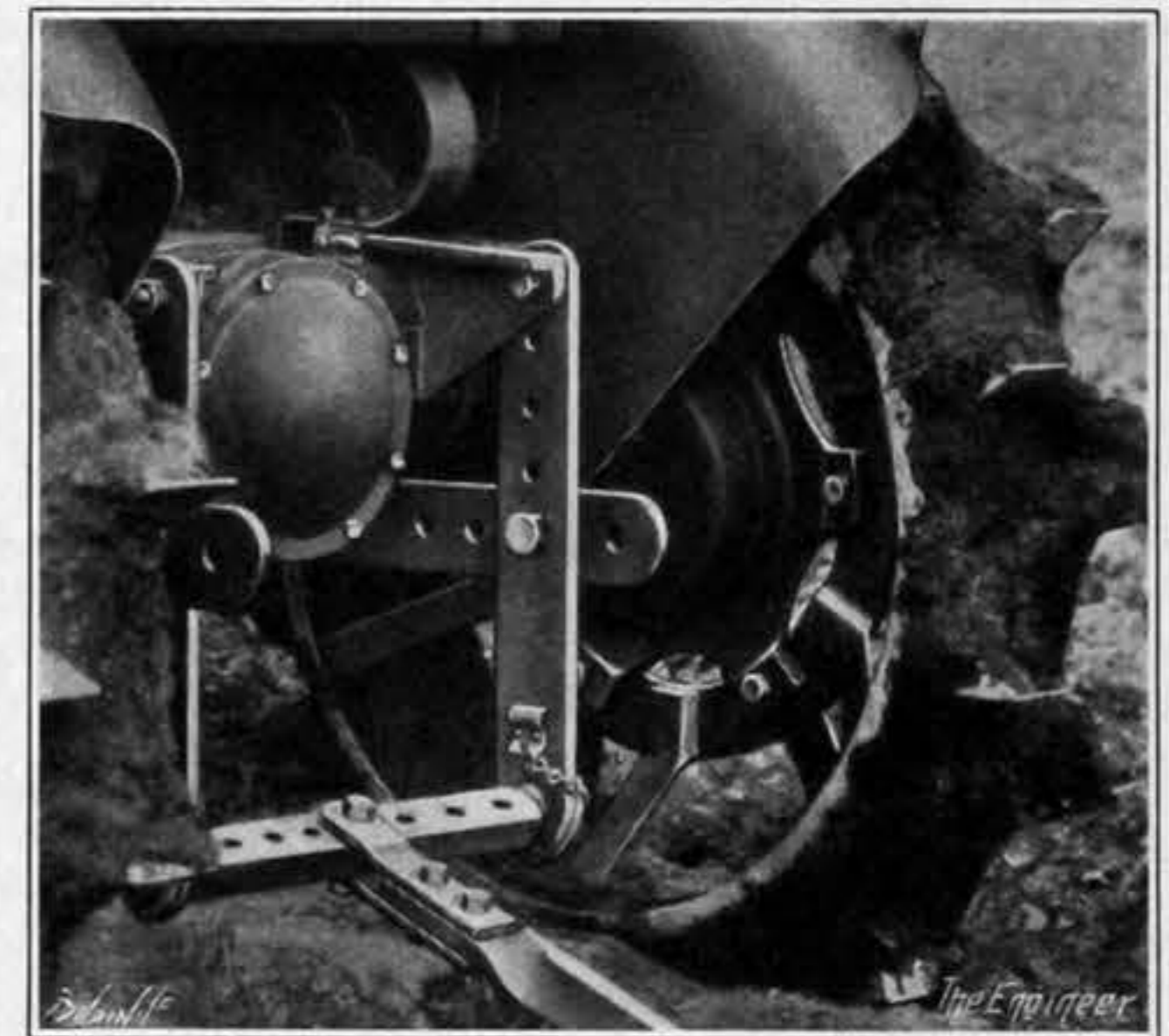


FIG. 7—GEOMETRIC ADJUSTABLE DRAWBAR—DAVID BROWN

to the rear axle drive, and operated by the power take-off extension.

The principal dimensions of the new tractor are as follows:—Length, 101in.; width, 58½in.; wheel base, 64in.; and ground clearance, 16in.; while the complete weight is less than 25 cwt. The small design allows the tractor to be employed usefully in orchards and hop gardens, and for this reason the turning circle has been kept down to 8ft. 6in. The engine is generally similar in design to the Ferguson-Brown tractor; it is a four-cylinder unit with a 3½in. bore and a 4in. stroke. The designed output is 25 B.H.P. and 17 draw-bar horse-power. For road work an alternative governor setting is provided, giving a belt power of 33 B.H.P., with a road speed of nearly 20 m.p.h. The wheels are of special interest, as they are fitted with a common centre, which allows either rims for pneumatic tyres or steel wheels with spuds or a spud ring to be fitted. The governed road speeds are 2.2, 3.2, 4.5, and 9.5 m.p.h., with a reverse speed of 1.6 m.p.h. The power take-off, which projects from the rear axle casing and is centrally disposed, has a speed of

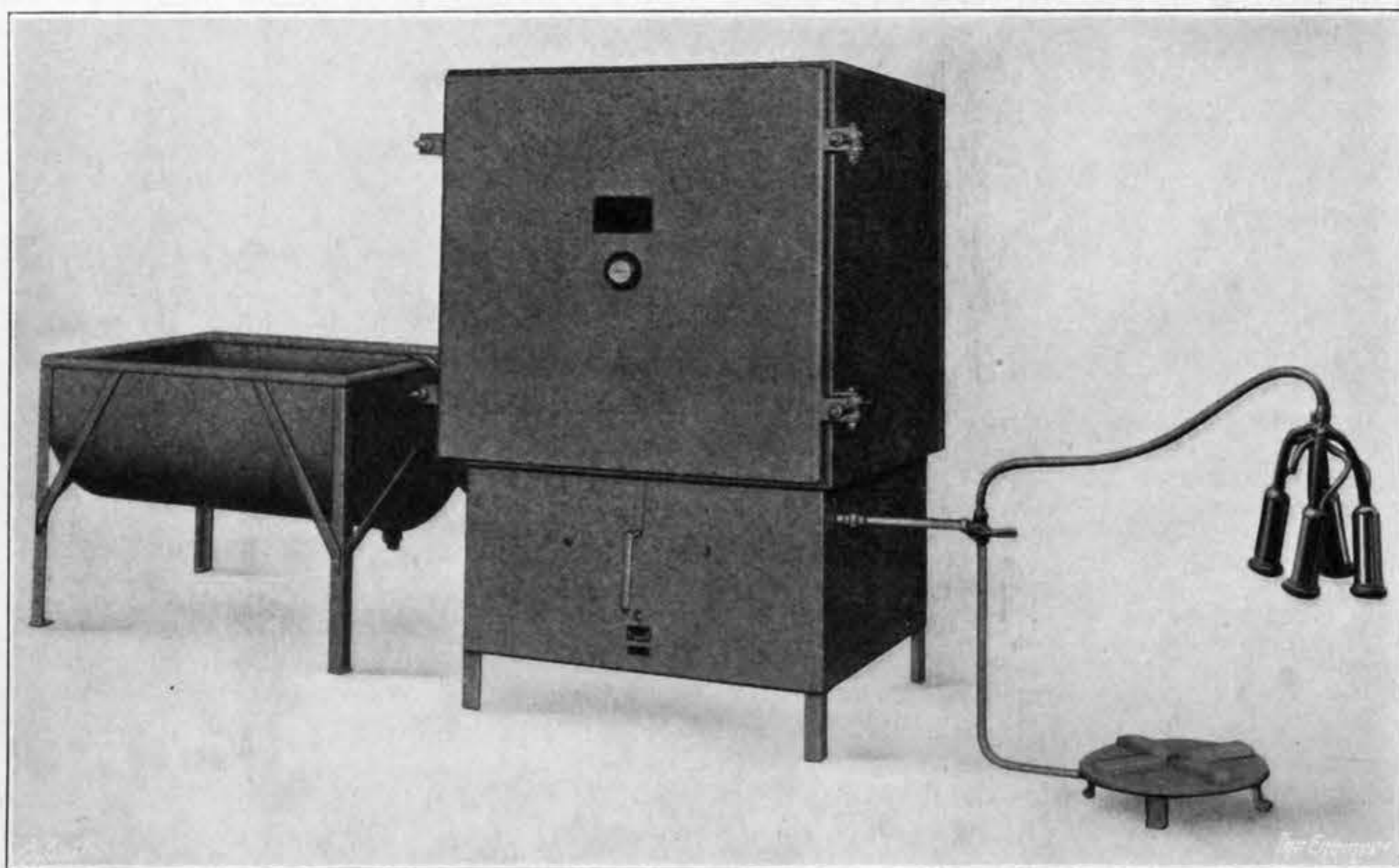


FIG. 5—STERILISING CHEST—G.E.C.

is a steel forging, and it, too, is mounted on Timken bearings which can be adjusted for wear. There is a flanged base with a spigot, which carries the front wheel hubs. These can be steel or pneumatic tyred, and the two wheels are inclined slightly towards each other inwards, so as to give better steering by imparting a trailing effect to

of wheels are on view, also tractors specially designed for golf course work.

DAVID BROWN TRACTORS, LTD.

Another new British tractor is that shown for the first time by David Brown Tractors, Ltd., of Huddersfield. We may recall that in an article

555 r.p.m. Together with the new "David Brown" tractor we have described, the firm is continuing to manufacture the Ferguson-Brown unit with its associated implements, thereby increasing the range of tractors and implements offered by the firm.

WALLIS AND STEEVENS, LTD.

One of the largest oil-engined road rollers shown at Windsor is that on the stand of Wallis and Steevens, Ltd., of Basingstoke. It is the 8-ton

sized air chamber, along with a strainer which keeps the pump fully primed when the spraying is intermittent.

BLAW-KNOX, LTD.

On the stand of Blaw-Knox, Ltd., of Clifton House, Euston Road, N.W.1, there is on view a complete range of "Cletrac" crawler tractors ranging from 61 to 12 draw-bar horse-power. The two larger sizes of tractor are designed for heavy oil fuel, and the others for standard tractor

the crawler type tractor is 91in. overall with a width of 52½in.

JACK OLDING AND Co., LTD.

The firm of Jack Olding and Co., Ltd., which specialises in the distribution of American-made agricultural tractors, earth moving equipment, and roadmaking machinery, and which has recently moved into its new works at Hatfield, Herts, is showing at Windsor a full range of Caterpillar

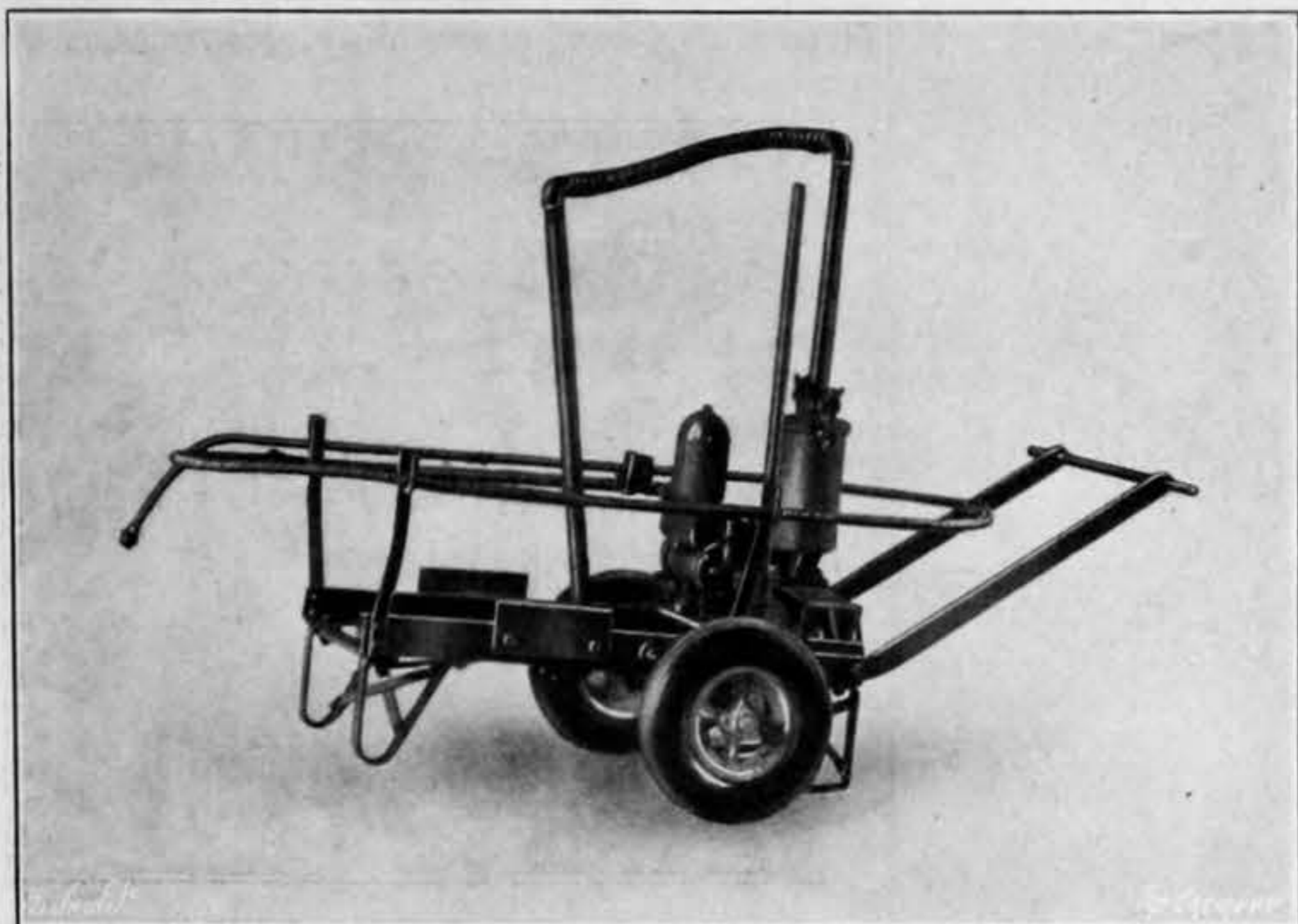


FIG. 8—HAND SPRAYER FOR COLD EMULSIONS—WALLIS AND STEEVENS

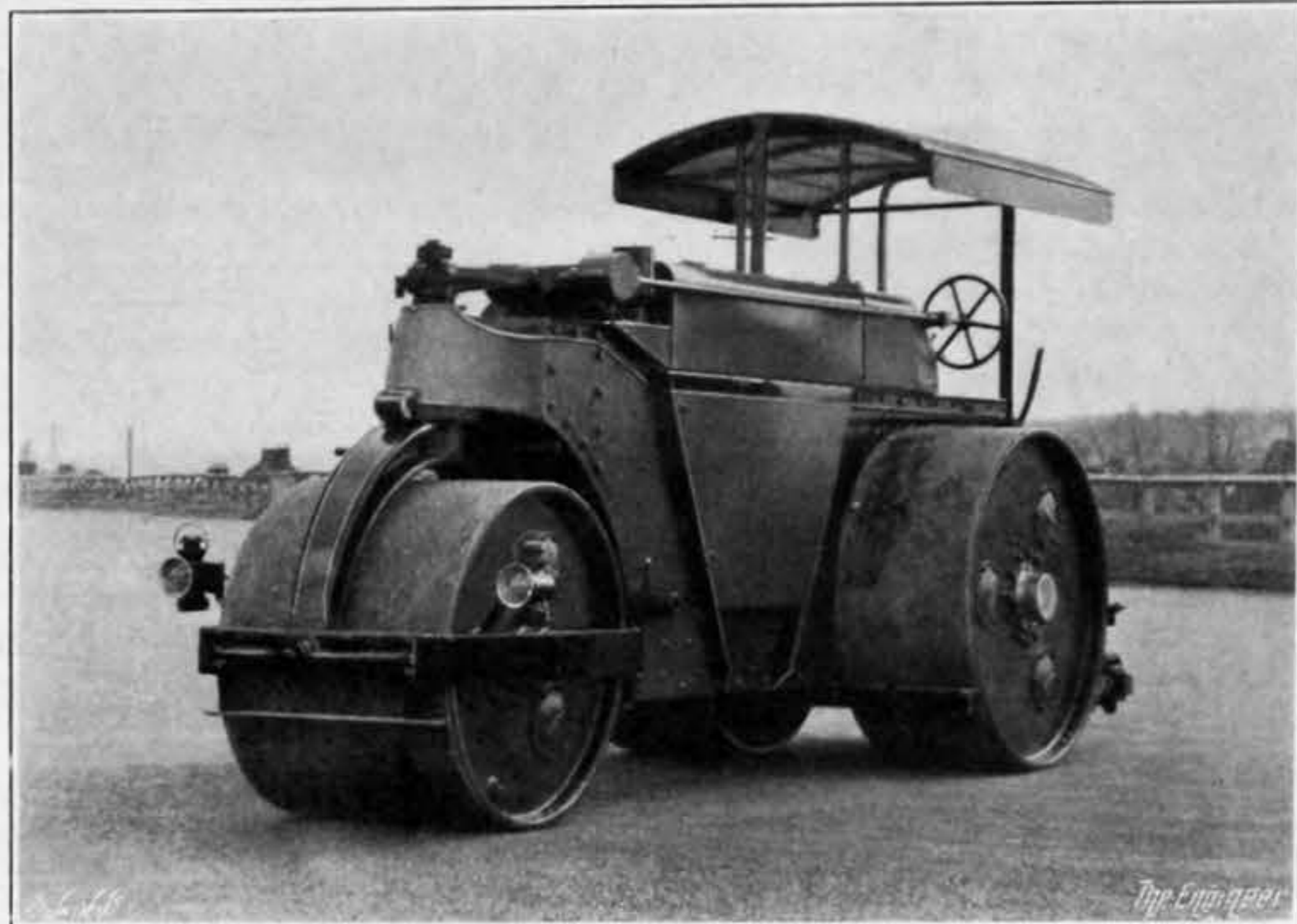


FIG. 9—8-TON OIL-ENGINED ROAD ROLLER—WALLIS AND STEEVENS

model—Fig. 9—of the firm's "Advance" series, and the engine fitted is a high-speed "National" working on the four-stroke cycle with direct injection. The three cylinders have a bore of 4½in. with a stroke of 6in., and with a swept volume of 3950 c.c. the designed output is 28 B.H.P. when running at 1050 r.p.m. The power from the engine is transmitted through a simple primary selecting clutch to a four-speed gear-box giving forward and reverse speeds corresponding to road speeds of 4, 2½, 1½, and ¾ miles per hour. The intermediate gears and the four-pinion differential gear are all machine cut and are totally enclosed, running in an oil bath, the final drive being by spur gear to both rear rolls. The rear axle is of the firm's patented automatic cambering pattern, and provision is also made to hold the rolls parallel or at any desired inclination by locking the axles. The rear rolls have a diameter of 4ft. 6in. with a width of 2ft., while the front roll has a diameter of 3ft. 9in. and is in two sections, each 1ft. 6in. wide.

The forecarriage, as will be seen from our engraving, is of an improved underslung pattern, which is designed so as to allow the front wheels to adapt themselves freely to the contour of the ground without transmitting any rocking motion to the chassis of the roller itself. This arrangement, it is claimed, produces much steadier rolling effect than does the overhead pivoted type. The steering is effected by a conveniently placed hand wheel which operates the steering pivot on the roller fork through an overhead reducing gear with a worm and segment. As will be gathered from our engraving, the frame of the roller is of heavy braced construction, with deep side plates. The design is such that ready access is given to both the engine and the transmission for running attention. Two brakes, a foot brake of the band type and a hand brake of the screw-operated type, with shoes acting directly on the inside of the rims of both driving rolls, are provided. The controls are neatly grouped in front of the driver. The fuel tank provides a supply of 30 gallons, which is sufficient for approximately thirteen to fifteen days on normal work. There is also provision made for towing and the attachment of a scarifier.

Another exhibit which we illustrate in Fig. 8 is a direct hand-spraying machine for cold emulsions, in which the drum or barrel of emulsion can be placed directly on the sprayer carriage, the suction pipe inserted and the fluid sprayed direct from the drum. There are two wheels which can be either steel or pneumatic tyred, with a diameter of about 18in. and a width of 3½in. on the face, giving, it is claimed, easy running and no sinkage. The wheels are carried on a swinging axle which gives a balanced load, whether the drum be full or empty. When the pump is being operated there is a steady foundation formed by the two wheels and the two struts at the end of the carriage. The pump is of the direct-acting type, with ball valves and a large-

paraffin vaporising oil. The firm is also showing various types of Blaw-Knox "G.B." light-weight pumps, including the "Midget" and "Bantam" models. The two new tractors of this year which represent the latest productions of the Cleveland Tractor Company, of Ohio, are the three-wheel "General" row crop tractor, shown on page 14, and the small "H.G." pattern "Cletrac" crawler tractor, a view of which we reproduce in Fig. 10. These new models are both fitted with paraffin fuel four-cylinder engines,

tractors, as well as some of the smaller earth moving equipment which we described in our recent special supplement on Plant for Work on Harbours and Docks. The firm is also displaying for the first time a full range of the new John Deere "H" type tractor, a view of which we reproduce on page 14. It is a particularly interesting design and has been constructed for two-row furrow plough work, two-row planting and cultivating, and handling a variety of power-driven, drawn and belt take-off machines. It is equipped with a twin-

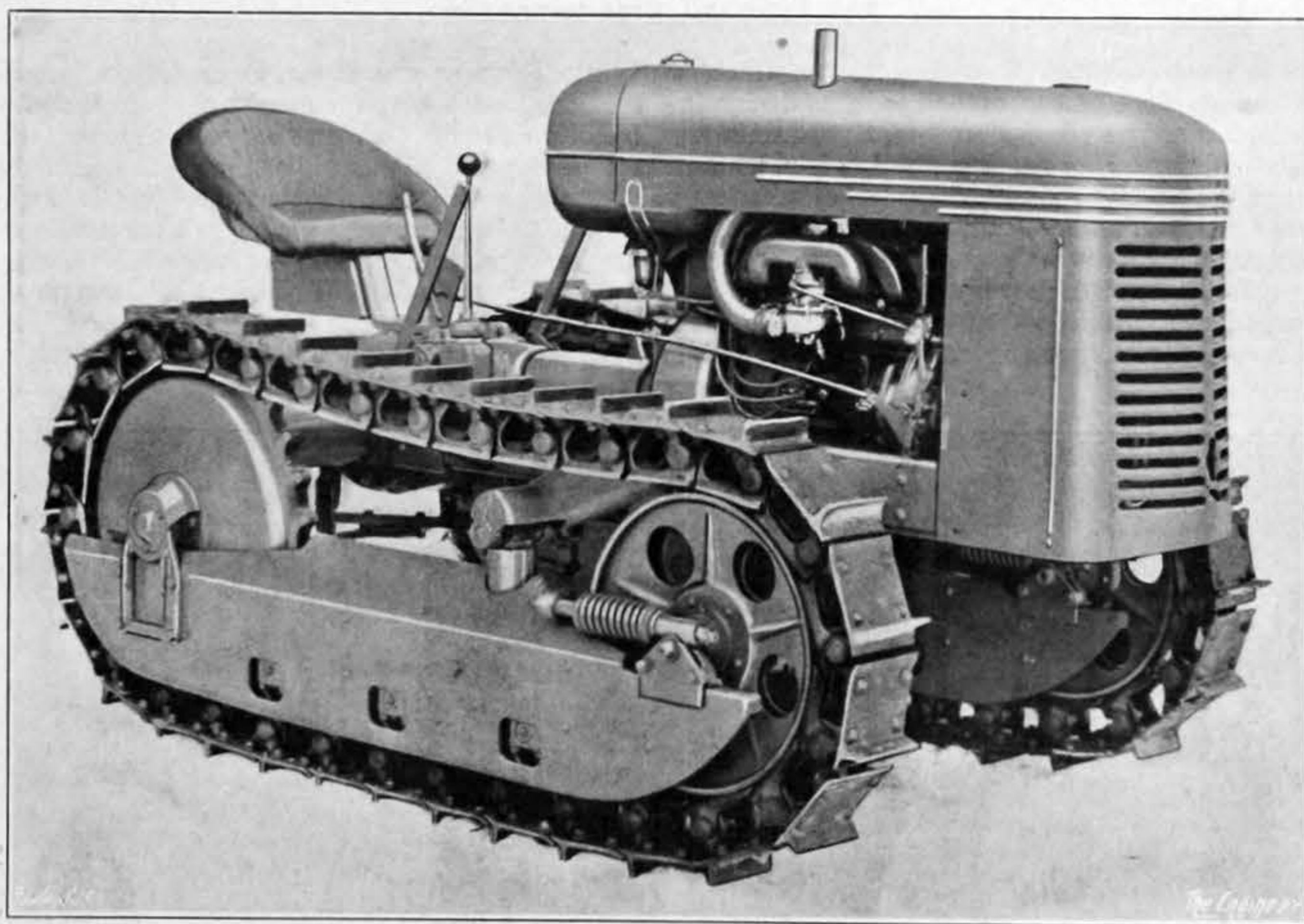


FIG. 10—"CLETRAC" CRAWLER TRACTOR—BLAW-KNOX

with designed draw-bar horse-powers of 12 and 16 respectively. The row crop tractor has speeds of 2.25, 3.5, 6.0 m.p.h., and 2.5 m.p.h. in reverse, while the speeds of the crawler tractor are 2, 3, 5, and 2.5 m.p.h. in reverse. This tractor has a track width of 6in. and 10in. track width is available. The total length of track on the ground is 50in., corresponding to a total area of ground contact of 600 square inches. On the row crop tractor the rear driving tyres are 9in. by 24in., and the front tyres, of the guide ring pattern are 5.50in. by 16in. A working pressure of 28 lb. is recommended or 12 lb. minimum and 14 lb. on the furrow tyre when ploughing. The row crop tractor has a length of 118in. overall and its width can be varied from 64in. to 85in., while

cylinder engine running at 1400 r.p.m. with a bore of 3⅝in. and a stroke of 5in. The speeds are 2½, 3½, 5½ m.p.h., and 1½ m.p.h. in reverse. By means of a special governor setting the engine can be run at 1800 r.p.m., giving a road speed of 7½ m.p.h. The front wheels have 4.00in. by 15in. pneumatic tyres mounted on two tapered roller and two roller bearings. The rear wheels are fitted with 6.50in. by 32in. pneumatic tyres, but 7.50in. by 32in. tyres are available. The track of the rear wheels can be varied from 44in. to 80in. and the wheel base of the tractor is 76in. with a turning radius of 7ft. 5in. The speed of the power take-off is 546 r.p.m. The overall length of the tractor is 111½in. and the overall width 75in.

(To be continued)

Rail and Road

L.M.S. STATION CLOSED.—The London Midland and Scottish Railway Company's stations at Garston (Church Road) and Northampton (St. John's Street) have been closed.

TRANSPORT IN CARDIFF.—The Cardiff Transport Committee has received a report from its Transport Manager stating that it is hoped that the change over from trams to trolleybuses in the city will be completed in eighteen months at a cost of £277,497.

ITALIAN RAILWAY ACCIDENT.—It is reported that a recently inaugurated express train running between Milan and the Bremner Pass ran into a stationary goods train at Lambrate Station on Sunday, July 2nd, and three persons were killed and about fifty injured.

L.M.S. SCOTTISH COMMITTEE.—In place of Mr. J. Whiteford Murray, who has retired, the directors of the London Midland and Scottish Railway Company have appointed Captain Sir Ian Frederick Cheney Bolton, of West Pleau, Stirling, a member of the company's Scottish Committee.

ROAD AND RAIL TRANSPORT.—During the next session of Parliament a Bill will be introduced to give effect to the recommendations of the Transport Advisory Council on the "square deal" proposals of the main line railways. A Central Conference representing the two interests has begun the task of co-ordinating rail and road goods transport.

INDIAN RAILWAY ACCIDENT.—When an express train from Delhi to Dekra Dun left the rails near Moradabad early in the morning of June 28th last, ten people are reported to have been killed and twenty-one injured. It is stated that the bank near a culvert subsided as a result of heavy rains, and the engine and three coaches fell into the breach.

LEVEL CROSSINGS.—The Minister of Transport was recently asked in the House of Commons how many level crossings had been abolished in this country during the past five years. He replied that since April 1st, 1934, thirty-seven level crossings have been eliminated or avoided. In twenty other cases works are in progress and thirty-two further schemes are at present under consideration.

SOUTHERN RAILWAY ELECTRIC STOCK.—The Southern Railway Company at present owns 3189 electric passenger vehicles, according to Mr. A. Raworth in *Modern Transport*. Of these vehicles, 2586 are designed for a maximum speed of 60 m.p.h., and the remainder for 75 m.p.h. It is pointed out that in the first batch of 336 motors of the former type, which have been in continuous service since 1915, only five armatures have been rewound.

NEW BLAST PIPE CAPS ON S.R. LOCOMOTIVES.—The "Lord Nelson" class engines of the Southern Railway Company are being fitted with blast pipe caps with five 2½ in. diameter nozzles discharging into a chimney 2ft. 1in. diameter at the choke. The five small nozzles have a 13 per cent. greater cross-sectional area than the original single blast pipe tips with a 5½ in. diameter orifice discharging into a chimney 1ft. 3in. diameter at the choke.

ELECTRIC RAILWAYS IN SWEDEN.—The length of electrified lines in Sweden totals about 3700 kiloms., or half of the Swedish State Railways system. These lines handle about 85 per cent. of the country's total rail traffic, according to Mr. I. Overholm, and had resulted in an increase in the speed of passenger trains by up to 30 per cent. and electrically hauled goods traffic up to 50 per cent. He points out that between 1931 and 1938 about £10 millions was spent on electrification, and the schemes in hand involved an expenditure of over £4 millions.

LONDON MIDLAND AND SCOTTISH RAILWAY.—The fourth annual presentation of shields to the winning districts in the London Midland and Scottish Railway Company's Motive Power League (for the reduction of engine casualties) was held at the Euston Hotel on June 28th, when Mr. T. W. Royle, the chief operating manager, said that several records had been attained during 1938. The past year had produced the highest miles per casualty figure, and in the last four weeks the debitable engine casualties only amounted to 202, the lowest on record. Mr. D. C. Urie, superintendent of motive power, drew attention to the fact that out of between 80,000 and 90,000 locomotive axle bearings in use every day, only seven per day gave trouble by overheating.

A LIGHT ALLOY ROAD TANKER.—A new road tanker recently completed for the Northern Aluminium Company, Ltd., provides a good example of the saving which can be effected by light alloy construction. Built on an Albion chassis by W. P. Butterfield, Ltd., of Shipley, Yorks, the tanker has a capacity of 1200 gallons with unladen weight of 2 tons 9 cwt., which allows a speed of 30 m.p.h. The sheet with which the tank is constructed is a 1½ per cent. manganese aluminium alloy, and is gas welded. The tension straps are constructed of a similar material, and the castings supporting the tank are also of light-weight alloy. It is pointed out that a welded steel tank on a similar chassis falling within the 50 cwt. category would have a capacity of between 900 and 1000 gallons; the use of aluminium therefore allows an increase in carrying capacity of 20 per cent.

CAMBRIDGE ARTERIAL ROAD IMPROVEMENTS.—The traffic capacity of the Cambridge arterial road on the 2-mile section between Bury Street and Carterhatch Lane, Middlesex, will be more than doubled in the course of the next eighteen months by the building of a second carriageway and the widening of the existing one. In addition, cycle tracks and footpaths will be provided. The new carriageway will be 27ft. wide and the width of the old one, now 24ft., will be increased accordingly. Included in the scheme is the widening of the bridge over the London and North-Eastern Railway. This is at present 60ft. and is to be widened to 100ft. The proposed improvement, which will cost about £100,000, is part of a general scheme for duplicating the existing carriageway and the lay-out is similar to that already adopted on the section between Lordship Lane and the North Circular Road.

Miscellanea

WELSH TIN-PLATE INDUSTRY.—In the course of his presidential address to the Swansea Exchange, Sir William Firth said that the order books of the sheet and tin-plate industry indicated that plants would be operating near to capacity well into the autumn, but the future remained somewhat obscure. He believed that amalgamation in the sheet and tin-plate trade of this country was urgently necessary in the interests of shareholders and workpeople alike. In times of poor demand it was surely better to operate sufficient plant fully and so make possible a lower selling price than to operate efficient and inefficient plant partially and so increase costs and selling price.

ANODICALLY OXIDISED ALUMINIUM ALLOYS.—An article in *Metals and Alloys* deals with the effects of electrolytic oxidation on the colour and uniformity of appearance of anodic coatings on aluminium alloys containing a variety of constituents. Several methods of metallographic examination show that the size and distribution of the micro-constituents may have important effects on the oxidation characteristics. It is shown that the tendency of some anodically oxidised aluminium alloy samples to develop a streaked appearance during treatment is influenced by the size, amount, distribution, and oxidation characteristics of the micro-constituents.

SOCIÉTÉ DES INGENIEURS CIVILS DE FRANCE.—At a meeting held in Paris on Friday, June 30th, the President of the Société des Ingénieurs Civils de France, Monsieur Raymond Berr, presented the Gold Medal of the Société (Prix Annuel) to Mr. W. T. Halcrow, for his paper entitled "Tapping a Lake at 32 m. Below the Surface," read before the Société in Paris on May 27th, 1938. This is the first occasion on which the premier prize medal of the Société has been presented to a British subject since its award was instituted in 1861. Mr. Halcrow, who is the President of the British Section of the Société, described in his paper the Ben Nevis tunnel, through which water from Loch Treig is delivered to the British Aluminium Company's power station at Fort William.

ELECTRICITY IN MINES.—In the House of Commons recently, the Secretary of Mines was asked to state the number of explosions in coal mines attributable to the use of electricity in Scotland and England and Wales, respectively, during the last ten years; and whether, in view of the danger involved, any consideration had been given to the possibility of abolishing this form of haulage. He replied that in Scotland thirteen explosions were due to electricity out of 246 explosions from all causes, and in England and Wales twenty were due to electricity out of 214 from all causes. The use of electricity for haulage purposes was only one of many uses to which electricity was put. The subject had been considered in all its aspects by the Royal Commission on Safety in Coal Mines.

AIR RAID SHELTER DESIGN.—The award of the assessors has now been made in the competition recently held by the Air Raid Protection Institute, at the suggestion of the Lord Privy Seal, for the design of an above-ground air raid shelter for fifty persons, providing protection against blast, splinters, and light incendiary bombs. The premium of 100 guineas has been awarded to the design, octagonal in plan and carried out in monolithic reinforced concrete, submitted jointly by Mr. G. Kilner and Mr. Clifford Smith, of 173, Kingston Road, New Malden, Surrey. The designs submitted in the competition will be on exhibition at the headquarters of the Air Raid Protection Institute, 2, Millbank House, Wood Street, S.W.1, from Monday, July 10th, to Saturday, July 15th.

INSTITUTION OF ELECTRICAL ENGINEERS.—The annual conversation of the Institution of Electrical Engineers was held on Tuesday last, July 4th, at the Natural History Museum, South Kensington. Members and guests—who seemed to be more numerous than ever—were received by Dr. A. P. M. Fleming, President; Mrs. Morris Fleming, and the Council of the Institution. For those with musical tastes, excellent fare was provided in the form of a concert by the string band of the Royal Artillery, and an alternative concert at which the artists were Miss Olive Groves, Mr. Dennis Noble, Mr. Arthur Catterall, and Mr. William Murdoch. As usual, the occasion provided many opportunities of renewing acquaintanceships and maintaining friendships. By arrangement with the museum authorities, many of the halls were open to inspection.

INDUSTRIAL AIR RAID PRECAUTION ORGANISATION.—The Civil Defence Bill, which is now before Parliament provides that all industrial and commercial undertakings which employ more than thirty persons shall ensure that all their employees know what to do in the event of an air raid, and that the personnel necessary for first aid, anti-gas measures, and for fire fighting, is trained and equipped. A preliminary memorandum on the "Organisation of Air Raid Precautions Services in Industrial, &c., Undertakings, and on the Training and Equipment of Personnel," has been prepared by the Air Raid Precautions Department of the Home Office, and published by his Majesty's Stationery Office, price 3d. It outlines the organisation and facilities which will be required to give effect to the provisions of the Civil Defence Bill in industrial undertakings, including commercial office buildings.

SURFACE WATER RESOURCES OF BRITAIN.—Prepared under the direction of the Inland Water Survey Committee, "The Surface Water Year Book of Great Britain, 1936-37," has just been published. It is the second of the series to be issued, and comprises a statistical report relating to the twelve-month period ended September 30th, 1937. It covers considerably more ground than the earlier volume. The measurements of which statistics are given relate to sixty-eight gauging stations in twenty-two river basins as compared with twenty-eight gauging stations in fourteen river basins in 1935-36. The new items have been supplied mainly by water undertakings, but they also include particulars in respect of the River Lee and the Warwickshire Avon supplied by the relative Catchment Boards, and of Lake Windermere furnished by the Freshwater Biological Association. The Year Book provides details of the run-off of each area and its rainfall.

Air and Water

THE IMPERIAL SHIPPING COMMITTEE.—Sir Halford Mackinder has resigned from the position of chairman to the Imperial Shipping Committee and has been succeeded by Sir William Clark.

NEW GERMAN CRUISER.—The fifth new German 10,000-ton cruiser "Lützow" was launched at Bremen on Saturday, July 1st. This ship will have a speed of 32 knots and be very heavily armed.

ANOTHER GLIDER RECORD FLIGHT.—On Saturday, July 1st, a new altitude gliding record was set up by Mr. P. A. Wills in a German-built Wolf-Hirth machine. He reached a height of 14,200ft.

NEW BATTLESHIP LAID DOWN.—On Tuesday, July 4th, the keel of the new 35,000-ton battleship "Lion" was laid at the berth at Vickers-Armstrongs Naval Yard at Barrow-in-Furness, from which H.M.S. "King George V" was launched.

SALTED RUNWAYS IN CANADIAN AIRPORTS.—As a result of the successful use of a mixture of salt and clay as a stabiliser for the foundation of highways and as a veneer for gravel roads, runways at a number of Canadian airports are being made by this method.

LONDON'S SHIPPING.—During the week ended June 23rd, 1073 vessels, representing 1,102,247 net register tons, used the Port of London. Of these 571 vessels, (896,420 net register tons) were to and from Empire and foreign ports and 502 vessels (205,827 net register tons) were engaged in coastwise traffic.

NEW DUTCH MOTOR LINER.—During her recent trials the new motor liner "Oranje," of the Netherland Steamship Company, reached a speed of 26.3 knots. She has three screws, each of which is directly coupled to a single, acting, two-stroke, airless injection oil engine capable of developing 12,500 H.P. at 145 r.p.m.

R.A.F.V.R. AND AERODROME SITES.—The smallness of the aerodrome accommodation near London has made it necessary for the Air Ministry to increase the number of aerodromes for the training of the Royal Air Force Volunteer Reserve. The Ministry is now considering a number of sites suitable for the construction of aerodromes.

NATIONAL GLIDING CONTESTS.—Twelve different types of sailplanes are included in the twenty-eight entries which have been received for the National Gliding Contests to be held at Camphill, Derbyshire, from July 8th to 16th. The entries include eight types of British design and construction, and one of foreign design built in this country.

A HIGH-SPEED FIGHTER.—It is reported that in official trials, with standard service equipment, a Vickers Supermarine "Spitfire" fighter recently reached a speed of 367 m.p.h. in level flight at Martlesham Heath. The machine was fitted with a variable pitch airscrew and the above speed was reached at a height of 18,400ft. Its top level speed at 18,500ft. with a fixed pitch airscrew is given as 362 m.p.h.

LLOYD'S REGISTER OF SHIPPING AMERICAN COMMITTEE.—It is announced that Mr. L. H. Korndorff, president of the Federal Shipbuilding and Dry Dock Company, Kearny, New Jersey, has been elected chairman of the American Committee of Lloyd's Register of Shipping. Mr. C. D. Mallory, president of the C. D. Mallory Corporation and associated companies, has been elected deputy chairman.

BRITISH OIL-FIRED STEAM TRAWLER.—The "Akita," the first oil-fired steam trawler to be built and owned in this country, has been completed by Cochrane and Sons, Ltd., for Neale and West, Ltd. She is 127ft. 6in. long by 24ft. 8in. beam and has a mean draught of 10ft. 8in. Her 625 I.H.P. triple-expansion engines have cylinders 13in., 22½in., and 37in. diameter by 26in. stroke, the working pressure being 200 lb. per square inch. During her trials an average speed of 10.5 knots was attained.

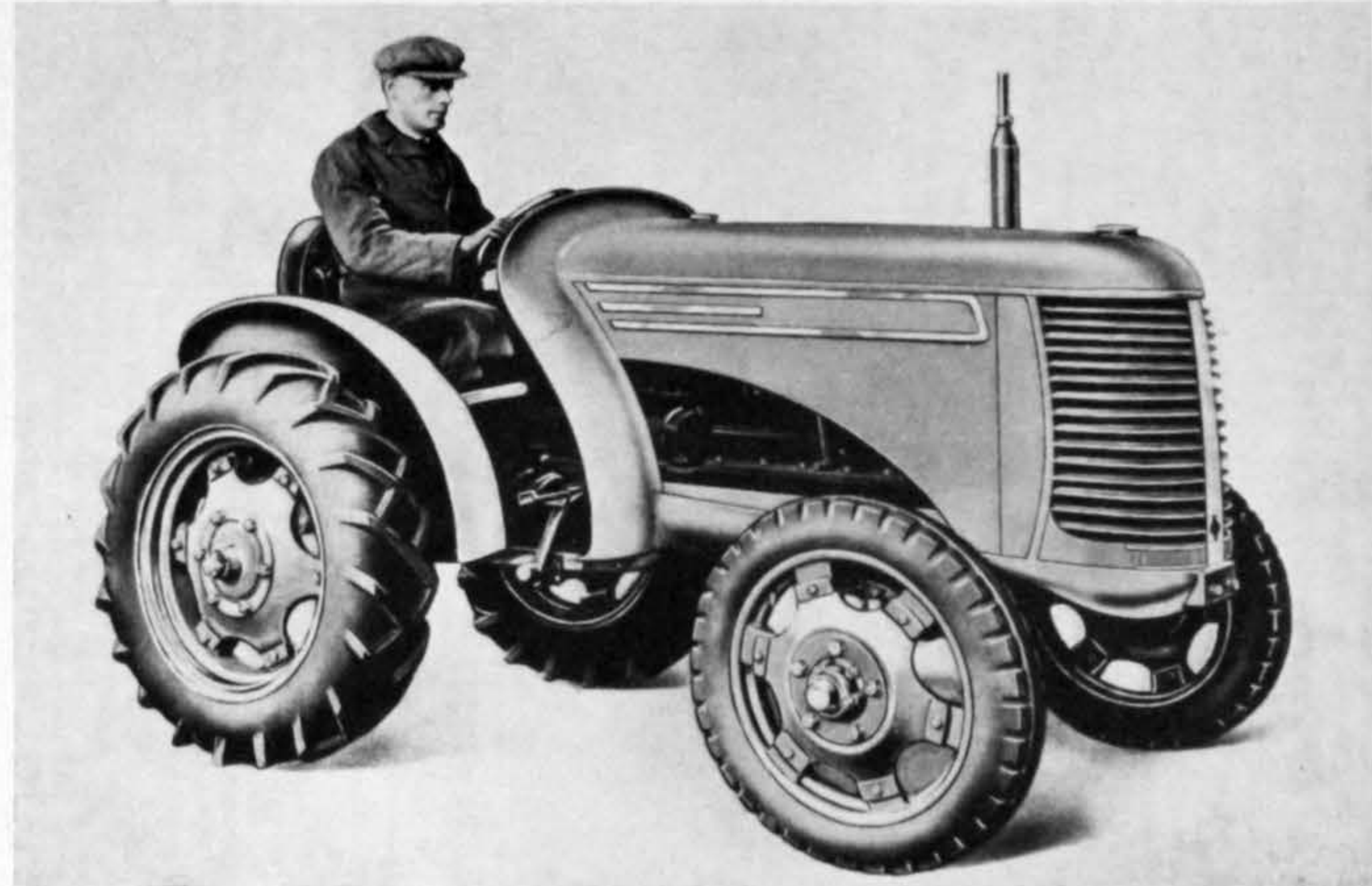
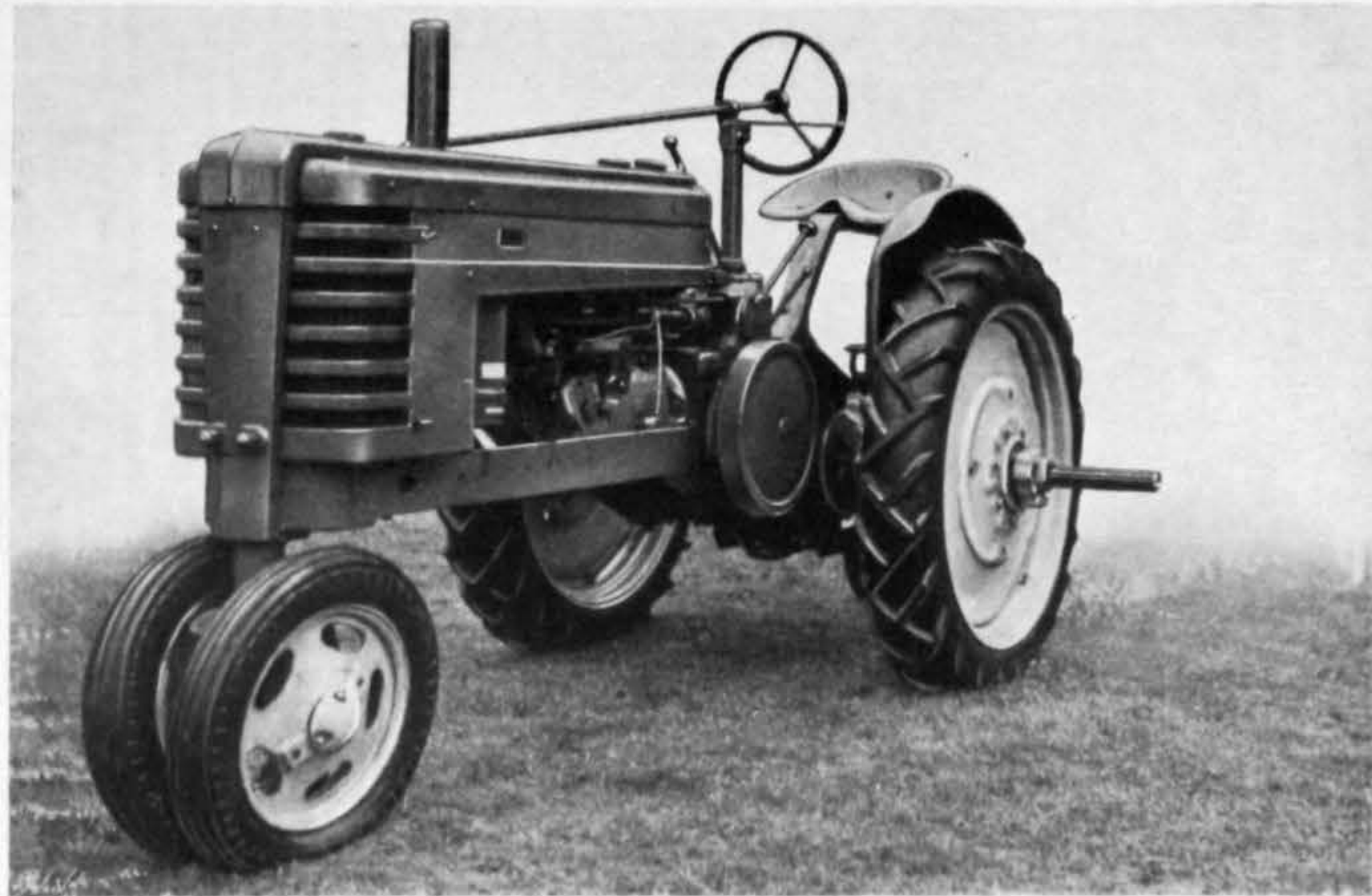
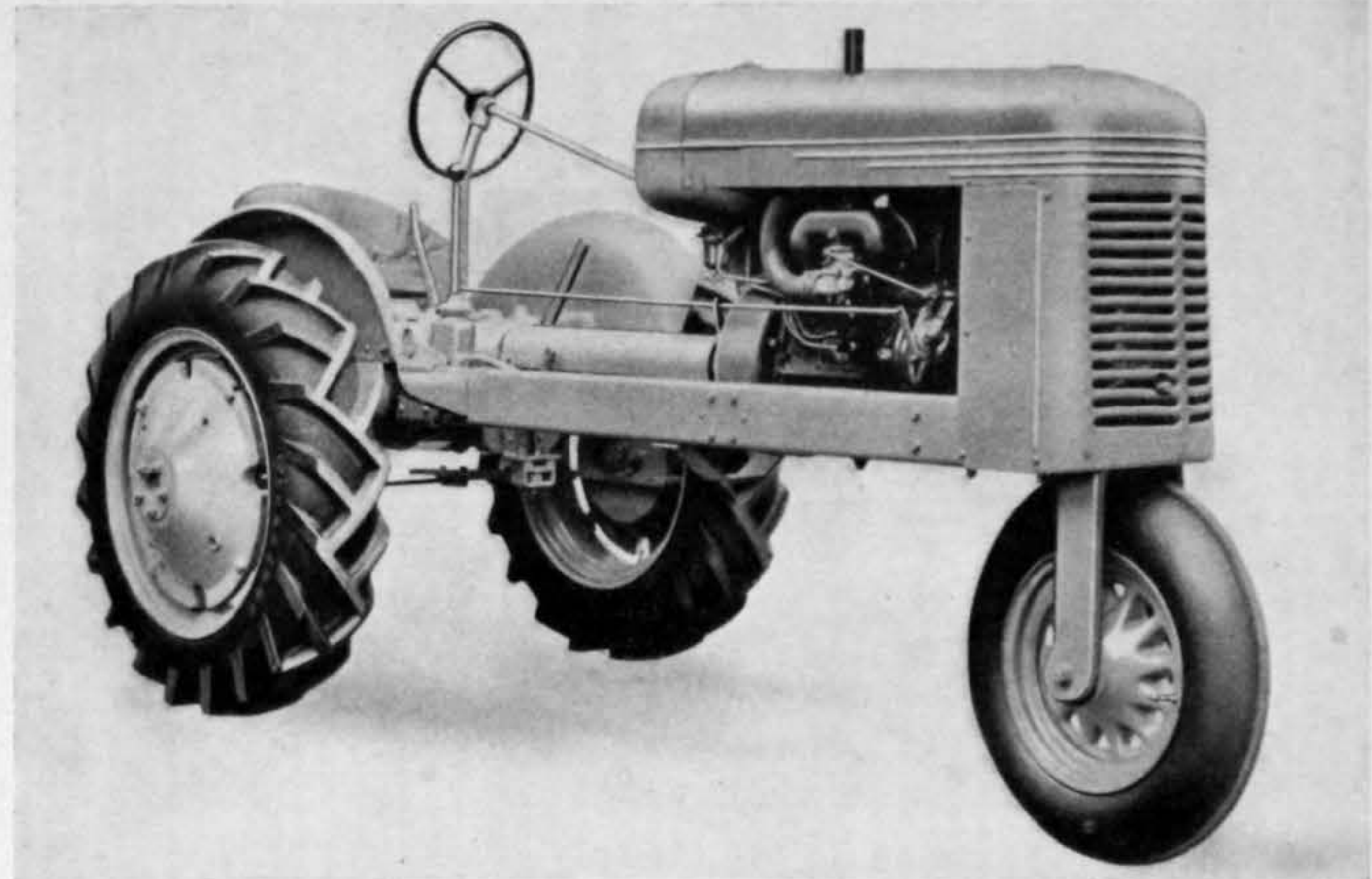
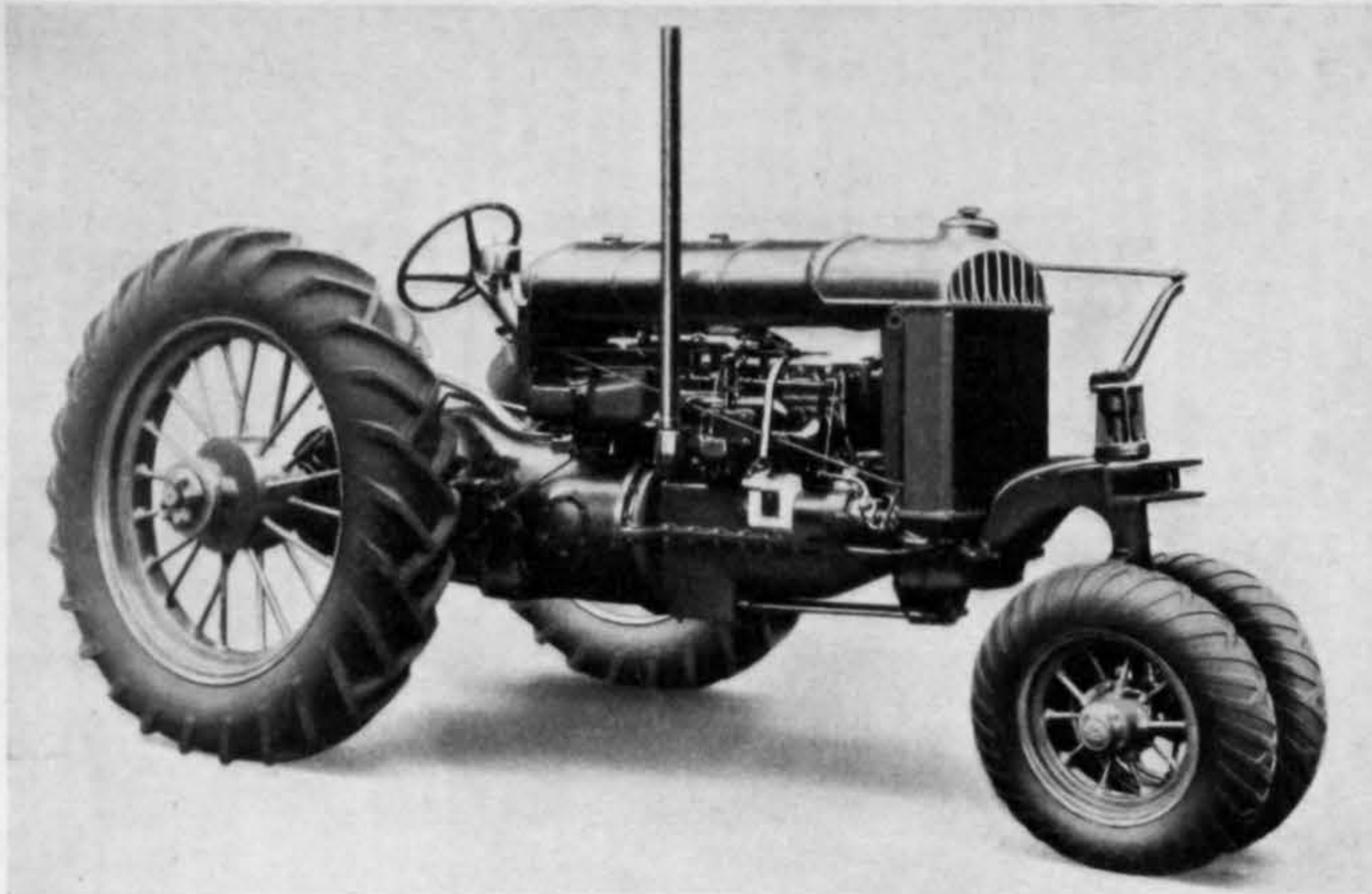
LLOYD'S REGISTER OF SHIPPING.—On Tuesday, July 4th, the Chairman and Committee of Lloyd's Register of Shipping gave a luncheon at the offices of the Society to the Lord Mayor and Sheriffs of London. Many representatives of the shipping industry, the shipbuilding industry, the Defence Services and the Board of Trade were present, and the guests were received by Sir George Higgins, the Chairman of Lloyd's Register, Mr. Ernest L. Jacobs, the Deputy Chairman, and Mr. R. M. K. Turnbull, the Chairman of Classification.

BELGIAN AIR LINES.—According to the new time table of the S.A.B.E.N.A., which has just been issued, convenient air service to Brussels and Frankfurt is provided by the "Vienna Air Rapide," which leaves Croydon at 8.45, arriving in Brussels at 10, after a seventy-five minutes' flight. Frankfurt is reached at 11.30, and Vienna at 14.50. This service is maintained by 21-seater Douglas "D.C.3" air liners. Another service leaves Croydon at 14.00 and arrives at Vienna at 21.45. In connection with the International Water Exhibition at Liège, all passengers arriving by air in Brussels, if in possession of Belgian tourist vouchers, are entitled to a free rail pass, second-class, from Brussels to Liège. New services to Ostend and Le Zoute have begun and will be supplemented by new services on Fridays, Saturdays, and Mondays, from July 14th.

NEW DUTCH LINER'S ENGINE.—A new 2687-ton liner, "Batavier III," has been placed in the Rotterdam-London service of the Batavier Line. This vessel is propelled by an interesting Werkspoor three-cylinder compound engine, having hydraulically operated Mier-Mattern type valve gear. Its normal output at 125 r.p.m. is 3000 I.H.P., the high-pressure cylinder being 650 mm. and the two low-pressure cylinders 1000 mm. diameter by 1000 mm. stroke. The three cylinders are separate castings assembled into a longitudinal girder by bolting the receiver passages together. Each cylinder has separate inlet and exhaust valves of the double-beat poppet type. The hydraulic valve gear is operated by oil led through pipes from pumps operating directly from the engine. Each valve has one pump, and engine control is effected by turning the pump pistons through an angle to adjust the oil pressure.

TRACTORS AT THE CENTENARY ROYAL SHOW AT WINDSOR

(For description see page 10)



ROWCROP TRACTOR—FORDSON
JOHN DEERE TRACTOR—OLDING

ROWCROP TRACTOR—BLAW - KNOX
25 B.H.P. TRACTOR—DAVID BROWN