

NEW MECCANO SUPER MODEL:

Warehouse with Elevators

An Imposing Example of Lifting Machinery

WITH the rapid development of our large cities and the corresponding rise in the value of building sites, economy in ground area has resulted in the erection of increasingly high buildings having a great number of floors. In such buildings the installation of passenger or goods lifts is necessary in order to render the upper floors easily accessible. These modern lifts are usually operated by electric motors, although there are some engineers who prefer to drive their lifts by hydraulic power or other means.

The hydraulically-operated lift is not met with so frequently, but in places where water under high pressure is readily obtainable it still holds its own against the electric type, especially if excessive loads have to be handled, because it is comparatively cheap in initial cost and upkeep. It is particularly suited for use where a lift is required to rise and fall through a short distance only.

In such cases it is usual to install the direct-ram machine, a device that consists essentially of a long cylinder containing a piston or ram, the whole being sunk into the ground beneath the lift well. The ram is attached directly to the underside of the lift cage, and the cylinder is fitted with valves so that water may be admitted at great pressure into the cylinder beneath the piston. The incoming water forces the ram and cage upward. To lower the lift it is only necessary to open the exhaust water valve on the cylinder and, the pressure being released gradually, the ram and cage descend by their own weight. The chief disadvantage of this system is, of course, the great length of cylinder and ram which would be required for a high building, and this is one of the reasons why the type is now but seldom employed. Another disadvantage lies in the fact that the long cylinder is liable to fracture or the pipes may burst under the great pressure.

Modern High-speed Lifts

Lifts hauling goods traffic usually

travel at the comparatively slow speed of 120 feet per minute, but it is the practice to provide variable speed gears in order that, if required, the lift may be operated at a higher speed. In restaurants, large shops and

offices, etc., where there are a number of lifts, they are usually arranged in batteries, some of the lifts running "express" or non-stop to certain of the higher floors and others running "local," or stopping at all floors. The express lifts will obviously be high speed machines; they usually travel at speeds up to 300 or 400 feet per minute. A speed of 150 to 180 feet per minute is usually chosen for the "local" lifts in order to avoid violent acceleration and deceleration.

In designing any type of lift there are naturally many factors to be considered, one of the most important being the necessity for absolute safety. Also, when stopping at each floor, it is very desirable to be able to bring the lift from full speed to rest without jar or shock, and much attention has been given to this point during recent years.

In most modern lifts the cars are suspended by multiple-strand steel ropes, as past experience has proved that chains are unsatisfactory for the purpose. One of the great disadvantages of chain suspension is that a chain is liable to fail suddenly without giving any previous warning.

To prevent the cage falling in the event of failure of the hauling ropes a special safety gear is fitted. It is usually arranged either above or immediately beneath the cage. Different makers, of course, fit different types of safety gear and there are a great number of these ingenious mechanisms in everyday use.

One of the foremost British firms has designed a type of gear which consists essentially of four cams, mounted on steel shafts and suitably supported under the floor of the cage. The apparatus is operated by a separate "safety" rope that is directly attached to the camshafts and so designed that in the event of failure of the suspension ropes

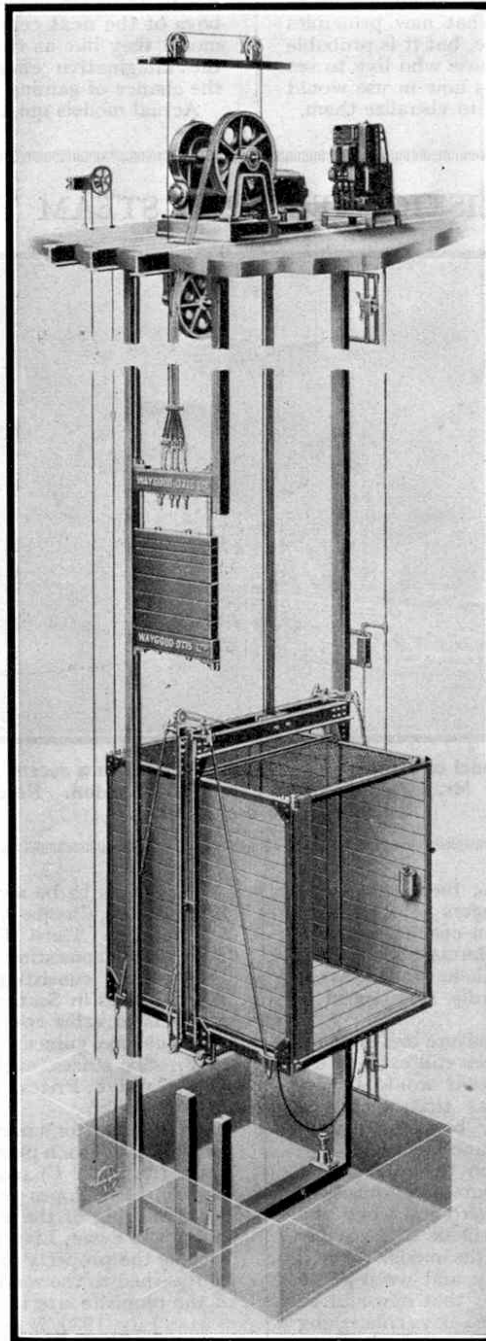


Fig. 1. This illustration of a modern Electrically-operated Goods Elevator provides an interesting comparison with the Meccano model shown in Fig. 2.

(which are attached to the body of the cage) the four cams will be drawn in and will grip simultaneously on the steel guides between which the cage travels. This type of gear is fitted to the lift shown in Fig. 1. It is manufactured by Waygood-Otis Ltd., of London, one of the pioneer firms in the lift building industry.

This safety apparatus, while being quite efficient and reliable, has a disadvantage in that it acts rather suddenly and brings the cage to a standstill with a jerk. In view of this it is hardly suitable for use with high speed "express" passenger lifts and for such lifts a special type of gear has been devised by the same makers. It is brought into operation by a speed governor immediately the lift cage attains an excessive speed due to any failure in the brake machinery or of the wire lifting ropes. This form of safety device is arranged to come into operation gradually and stop the car without sudden shock or jerk—a feature which, as will be easily recognised, is absolutely essential in the case of a lift travelling at high speed.

The Lifting Machinery

The following are a few particulars of the mechanism supplied by Waygood-Otis Ltd. with their electric goods and passenger lifts.

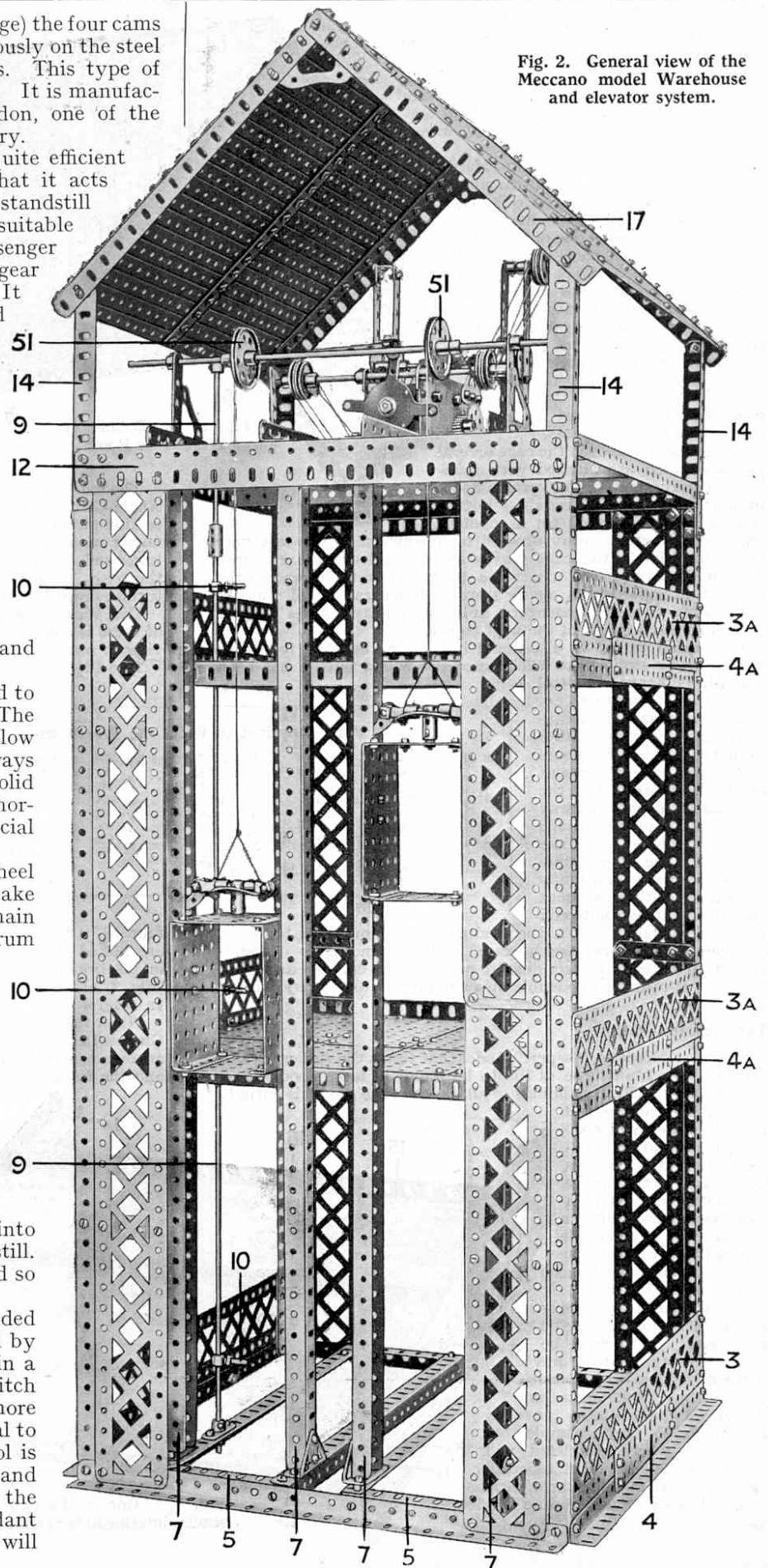
The winding motor is directly coupled to a worm and wheel reduction gear. The worm, which is placed immediately below the wheel and arranged so that it will always be running in a bath of oil, is made of solid cut steel, while the wheel is of phosphor-bronze. They are enclosed in a special type of gear box.

To reduce wear and tear on the wheel teeth, ball thrust-bearings are fitted to take the thrust of the worm shaft. The main driven shaft is fitted with a hoisting drum of large diameter that has four grooves turned in its surface to take four stranded steel wire lifting ropes which are connected at one end to the "cage" and at the other end to a heavy counterbalance.

A powerful automatic magnetic brake is fitted and is arranged to engage with a drum that forms the outer portion of the coupling between the motor and the worm gearing. In the event of the electric current failing the brake instantly comes into operation and brings the cage to a standstill. In large lifts, two such brakes are fitted so as to ensure absolute safety.

The older types of lift or those intended for handling goods are often controlled by a hand rope led through the "cage" in a suitable position and connected to the switch or valve gear. In the case of the more elaborate lifts, however, where it is usual to employ a special attendant, the control is by means of a switch placed in the cage and fitted with a "self-centring" handle, the idea being that should the attendant release the handle inadvertently it will

Fig. 2. General view of the Meccano model Warehouse and elevator system.



automatically take the "off" position.

In some cases, however, it is not possible to employ a special attendant to operate the lift and this fact has necessitated the invention of an automatic system, so that anyone can operate the lift as required. The automatic control system is used largely in lifts installed in warships and ocean liners, etc., as well as in office and hotel passenger lifts.

The system as fitted by Smith, Major, and Stevens Ltd., of Northampton, consists of a series of electric "push" buttons provided at each floor of the building. By pressing one of the buttons for an instant, the cage is brought to the particular floor at which the button is situated, where it stops automatically and unlocks the entrance door which, by the way, cannot be opened until the cage arrives. The intending passenger can now enter the cage, but to avoid accidents the electric circuit is so arranged that he cannot move the cage away until he has closed the lift and entrance doors.

The passenger finds in the cage several buttons which are marked with numbers to correspond to the various floors in the building. The required button is selected and pressed for a moment and the cage starts away upward or downward as the case may be. Immediately the cage moves away it relocks the entrance door it is leaving and continues to travel until it reaches the selected floor, when it again stops automatically and unlocks both doors, when the passenger is at liberty to leave. The "cage" is then at the disposal of the next comer.

It is usual to fix an additional button in the cage to enable the lift to be stopped at will in case the wrong button has been pressed. This type of control renders lift working extremely safe as a door cannot possibly be opened either from the inside or outside unless the cage is present at the floor level, and the cage cannot be moved away from a floor unless all the doors are closed. In the older lifts the cage sometimes "over-ran" the limits of its travel with consequent danger of damage not only to the cage itself but also to the winding gear. Nowadays, however, emergency electric switches operated by the ascending or descending lift are fitted at certain definite points in the cage pit and these render over-running impossible by switching off the electric supply to the motor.

The Meccano Model

The new Meccano "super" model that forms the subject of this article represents a type of lift to be found in large goods warehouses and industrial buildings of all kinds. The model is entirely automatic in action and the two cages will continue to ascend and descend alternately just as long as the electric supply is maintained. As in a real warehouse lift, a special type of safety device is fitted to each cage.

The lifting mechanism is operated by a 6-volt Meccano Electric Motor mounted at the top of the warehouse. It may be stopped or started from any of the floors in the warehouse. The lifting mechanism employed is particularly novel. The model is quite simple to build and when completed will afford hours of enjoyment, especially if the cages are made to carry various small articles such as Meccano Loaded Sacks, etc.

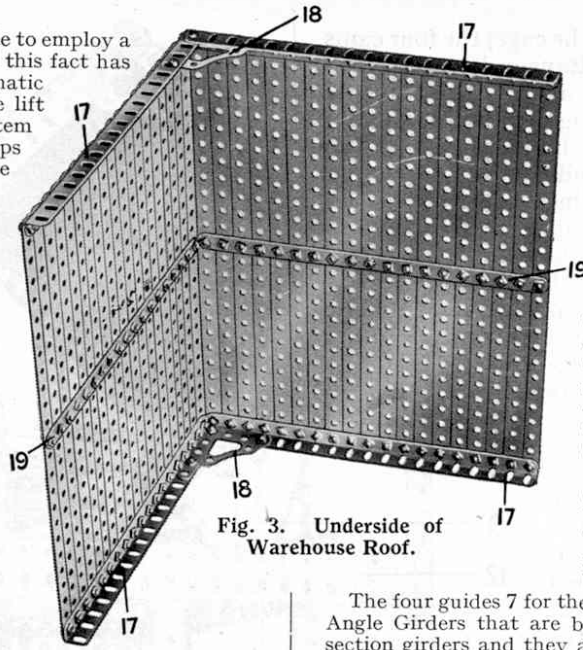


Fig. 3. Underside of Warehouse Roof.

Construction should be commenced by building the framework. Referring to Fig. 2 it will be seen that this comprises four vertical 24 1/2" Angle Girders that are bolted at their lower ends to four 12 1/2" Angle Girders. The method of securing the latter to the vertical girders will be quite clear from the illustration. To the 12 1/2" Angle Girders are attached 12 1/2" Braced Girders that are further supported by means of 2 1/2" Strips bolted across the Braced Girders and secured to the 24 1/2" Angle Girders. The sides of the base are enclosed by means of two 12 1/2" Braced Girders 3 bolted in the positions shown and secured by means of a 5 1/2" Flat Girder 4, the latter being bolted to the Braced Girders and to the side 12 1/2" Angle Girders in the base.

The front and rear 12 1/2" Girders each carry two 3 1/2" Angle Girders 5 that are bolted back to back to the 12 1/2" Girders. These 3 1/2" Angle Girders form supports for four 12 1/2" Angle Girders which are bolted across the base frame as shown.

The four guides 7 for the two lift cages are composed of eight 24 1/2" Angle Girders that are bolted together in pairs to form channel section girders and they are secured in position with the channels facing each other. To secure them, Trunnions are bolted to the lower ends of the guides and to the transverse 12 1/2" Angle Girders in the base. It will be noted that the flanges of the Trunnions are turned inward, that is, underneath the ends of the Angle Girders 7.

The Warehouse contains two floors above the base and each of these is constructed as shown in Fig. 4, which is an underneath view of one of them.

Two 12 1/2" Angle Girders 1a are bolted to three further 12 1/2" Angle Girders 15, one of the latter being bolted across the ends of the Girders 1a, while the other two are bolted in the eleventh and nineteenth holes from those ends respectively.

As in the base, the sides of the first and second floors are enclosed with 12 1/2" Braced Girders 3a that are bolted to the Girders 1a by means of 5 1/2" Flat Girders 4a. The floor proper comprises

38 of No. 1	6 of No. 9	2 of No. 17	2 of No. 37a	1 of No. 62	5 of No. 115
2 " " 1a	4 " " 9b	2 " " 18a	8 " " 38	4 " " 63	4 " " 126
4 " " 2	4 " " 9f	8 " " 21	1 " " 40	6 " " 70	2 " " 136
1 " " 2a	2 " " 10	8 " " 22a	1 " " 48	4 " " 72	2 " " 140
9 " " 6	2 " " 11	4 " " 24	8 " " 52a	14 " " 99	4 " " 147a
2 " " 6a	1 " " 12	4 " " 26	4 " " 53	4 " " 102	4 " " 147b
12 " " 7	3 " " 12a	2 " " 27a	2 " " 53a	6 " " 103	1 Electric Motor
26 " " 8	1 " " 14	2 " " 32	6 " " 58	2 " " 103b	
4 " " 8a	2 " " 15a	424 " " 37	28 " " 59	4 " " 108	

four 5 1/2" x 3 1/2" and four 5 1/2" x 2 1/2" Flat Plates that overlap and are bolted to the Angle Girders 15. The floors may be secured in position by bolts passed through the vertical 24 1/2" Girders 2 (Fig. 2) of the main framework and also through the Angle Girders 1a (Fig. 4).

When the floors are in position the projecting ends of the Angle Girders 1a (Fig. 4) must of course be at the front of the model. This arrangement will leave a recess between the front edge of the floor and the frame of the warehouse, so as to allow room for the cage guides and for movement of the cages.

The next step is to bolt the 5 1/2" Angle Girders 14 (Fig. 2) to the upper ends of the four vertical Angle Girders 2. After this, four horizontal 12 1/2" Angle Girders should be bolted to the 5 1/2" Girders 14 (see Fig. 2).

The roof is shown in Fig. 3 and consists of a number of 12 1/2" Strips placed side by side and bolted at their ends to 9 1/2" Angle Girders 17. Two equal sides each comprising nineteen Strips should be constructed and these are bolted together at an angle of 90 degrees by means of two Architraves 18. Two 9 1/2" Strips 19 bolted across the Strips forming each side of the roof help to brace the whole firmly together.

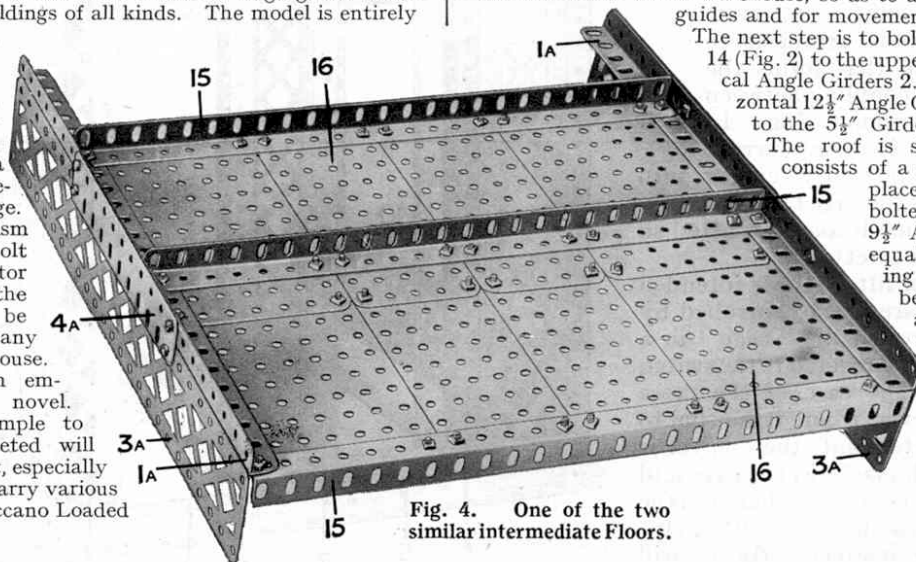


Fig. 4. One of the two similar intermediate Floors.

(To be Continued)

Warehouse with Elevators

Completion of Constructional Details

IN this article we conclude the detailed instructions for building the Meccano model Warehouse with Elevators. Last month we described the assembly of the structural portion of the model, comprising the Frame, Cage Guides, Platforms, and Roof. This month we deal with the construction of the Winding Gear, Cages, Safety Devices, and other mechanical features, and with the assembly of these parts in the framework of the Warehouse.

Construction of Cages and Safety Devices

One of the two similar cages is shown in Fig. 6. It consists of two $2\frac{1}{2}'' \times 3\frac{1}{2}''$ Flanged Plates 20 to the flanges of which are bolted $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates 22. Single Bent Strips 21 are bolted to the sides of each cage in such positions that when the cages are placed between the guides 7 (see Fig. 2 in last month's article) the Single Bent Strips 21 will slide in the channels of the guides and so form guide blocks for the cages.

The safety devices employed in the model are of a simple yet very interesting type. They are fitted to the

top of each cage as shown in Fig. 6 and each is constructed as follows. A Coupling 25 is secured to the roof of the cage by means of a $\frac{3}{8}''$ Bolt that is locked in position by a nut. In its upper transverse hole this Coupling carries a $1\frac{1}{2}''$ Rod that is secured centrally in the Coupling. The Rod carries two Fork Pieces 24 that are secured one on each side of the Coupling. Two Pawls 23 are held pivotally on bolts lock-nutted in the Fork Pieces as shown, and each Pawl has a $\frac{3}{8}''$ Bolt 23a instead of the usual grub screw, the bolt being held firmly by means of a nut screwed against the boss of the Pawl. The Bolts 23a must not grip the pivots on which the Pawls are mounted.

A piece of Meccano cord is attached to each of the bolts 23a and the ends of the cord are brought through the Fork Pieces behind the Pawl bosses in the manner shown in the photographs. (The two pieces of cord are later to be attached to the lifting cord 27). The ends of a length of Spring Cord 26 are also attached to the Bolts 23a.

When the lift cord 27 is in tension—that is, as soon as the cage is raised from the ground—the Pawls 23 are rotated slightly on their pivots and their projecting ends pulled downward clear of the lift guides. This movement bends the Spring Cord 26 so that one side of it is in tension. Now should the cord 27 break or fail for any reason the Pawls are no longer held down and owing to the action of the Spring Cord, which tends always to straighten out, the ends of the Pawls rise and engage with the elongated holes of the guides 7. The cage is consequently locked safely in position in the shaft and cannot be moved until the Pawls are pulled downward and clear of the guides.

This most interesting feature of the model is closely allied in principle to the safety device usually employed on the actual lift.

The Operating Mechanism

The mechanism incorporated in the model for lifting and lowering the two cages is of special interest as it enables the model to be worked for an indefinite period without attention. It is entirely automatic in action, and the arrangement is such that one cage is raised while the other is being lowered.

In operation, as soon as the Electric Motor is set in motion one

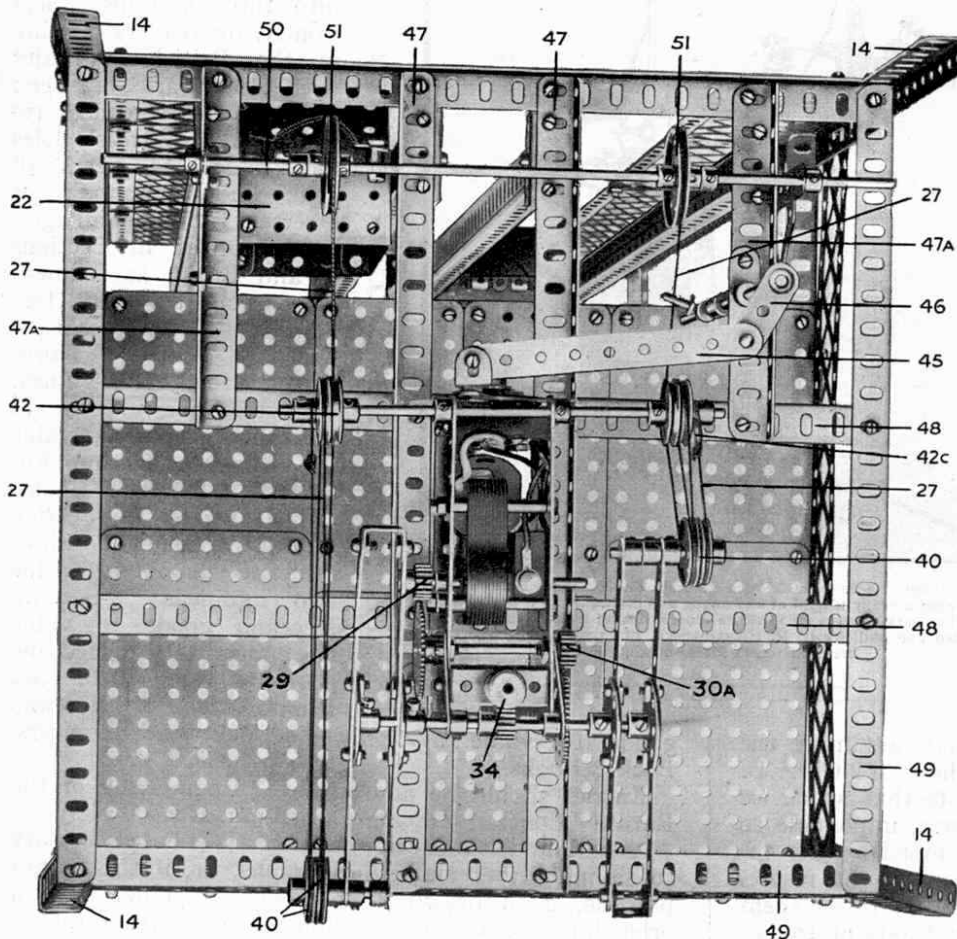


Fig. 5. Plan view of the Top Floor of the Warehouse, showing the arrangement of the mechanism.

of the cages ascends and the other descends until both cages have reached the top or bottom positions of their respective guides, when they come to rest as though to allow for loading and unloading. Then after a short pause the upper cage descends while the lower ascends, and the process is repeated each time the limit of travel is reached.

The 6-volt Meccano Motor is secured in position by bolting its flanges to the transverse Angle Girders 47 (Fig. 5). The drive is taken from the Motor armature via a $\frac{1}{2}$ " Pinion 29, the 57-teeth Gear Wheel 30, and a $\frac{1}{2}$ " Pinion 30a on the opposite end of the Rod carrying the Gear 30 that meshes with another 57-teeth Gear Wheel 31 on a 2" Rod (see also Fig. 7).

On the latter Rod is a Worm 32 meshing with a $\frac{1}{2}$ " Pinion secured to a vertical 3" Rod 33, which is journalled in bearings consisting of a $2\frac{1}{2}$ " Strip 43 bolted across the Girders 47 beneath the Motor (Figs. 5 and 7) and a $1\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strip 33a secured between the Motor side plates. The Rod 33 carries at its upper extremity a second Worm 34 meshing with a $\frac{1}{2}$ " Pinion on the $3\frac{1}{2}$ " Rod 35.

This Rod 35 is journalled in Corner Brackets, as shown, and carries at its ends the device whereby the automatic reversing hoist motion is obtained. It will be seen that it consists essentially of two rotating arms each of which is built up from $5\frac{1}{2}$ " Strips, secured rigidly to the Rod 35 by means of Bush Wheels 38, and a system of 1" loose Pulleys 40 and 42. The Pulleys 40 are free to run on a 2" Rod 39 journalled in each arm and the Pulleys 42 are mounted on a $4\frac{1}{2}$ " Rod attached to the Motor. A Washer is placed between the Pulleys to minimise friction and allow freedom of movement.

The spindle of the Pulleys 40 follows the circular path traced out by the end of the arm, while the spindle of the Pulleys 42 is fixed. The cord 27, which is attached to the cage, passes over the Pulleys 51 at the top of the lift shaft. It is then led under one of the 1" loose Pulleys 42, round one of the Pulleys 40, back to the remaining Pulley 42 and thence to the second 1" Pulley 40. After passing round the latter, it is secured to the Flat Bracket 42c.

On examining the illustration Meccano boys will observe that the system is similar in

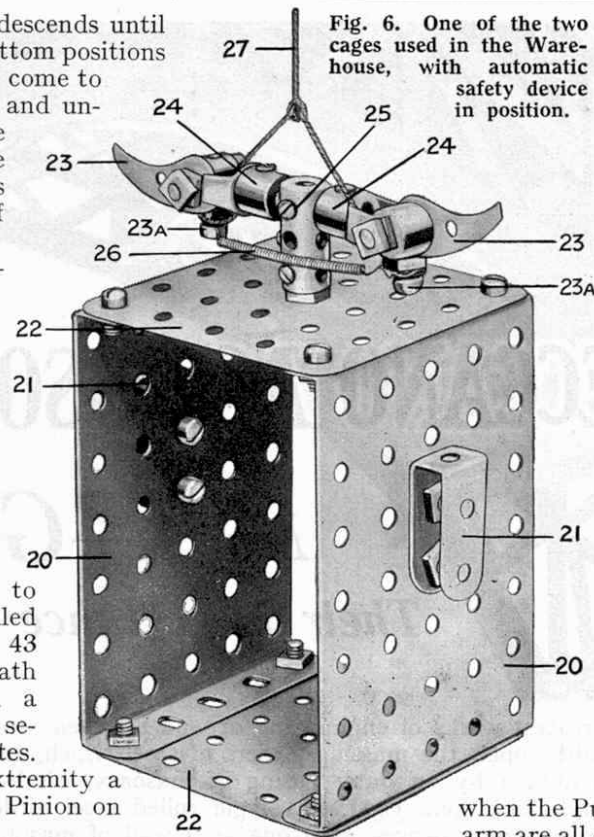


Fig. 6. One of the two cages used in the Warehouse, with automatic safety device in position.

effect to the two-sheave pulley block, in which the free end of the cord, where the power is applied, moves through four inches for every inch the load is raised. In the model, however, the load (i.e., the lift cage) is attached to the cord at a point corresponding to the free end in the ordinary pulley block, and the power is applied to the movable pulley block. Consequently the reverse effect is obtained, the lift cage moving through four inches for every inch of movement of the Pulleys 40 relative to the Pulleys 42.

When the Pulleys 40 advance towards the Pulleys 42, the hoisting rope is paid out, but as the distance between the two sets of Pulleys decreases, the relative motion between them also decreases, with the result that the movement of the cage becomes gradually slower until finally,

when the Pulleys 40 and 42 and the moving arm are all directly in line, all movement of the cord ceases. At this point the cage is at rest at the ground floor.

The rotating arm continuing its motion, now commences to withdraw the Pulleys 40, with the result that the hoisting cord is hauled in and the cage begins to rise, gradually gathering speed as the increasing angle of the rotating arm increases the relative movement between the Pulleys 40 and 42.

In view of the fact that a slight movement of the rotating arm results in a greatly magnified

movement of the cages, it will be apparent that the arms must rotate very slowly. This explains the use of the double worm drive from the Motor.

Owing to the considerable strains imposed upon the mechanism, the Pinion and Bush Wheels mounted on the shaft 35 should be secured very rigidly in position and if possible new style parts should be employed so that two set-screws can be inserted in each boss.

The extent of the travel of the cages may

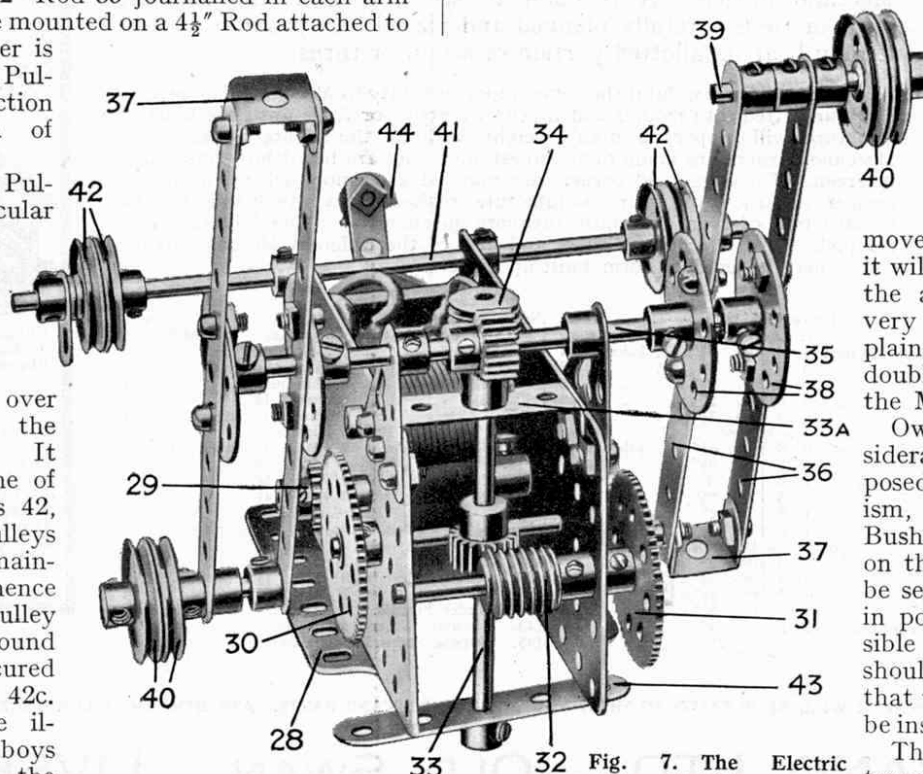


Fig. 7. The Electric Motor with lifting mechanism mounted in place.

(Continued on page 580)

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Warehouse with Elevators—

(Continued from page 553)

be varied considerably by altering the length of the rotating arms—adding to the length to increase the travel and vice versa—or by using additional Pulleys.

In the model, as in an actual lift, means are provided by which it is possible to start or stop the Motor and thus control the movement of the cages from any of the landing floors. This is accomplished by means of the control handles 10 (Fig. 2, see last month's article) which are secured to the Rod 9. A slight movement of any one of these handles either stops or starts the Electric Motor according to the direction in which the handle is turned. Threaded Pins 10 screwed into Collars form the handles.

The Rod 9 consists of two 1 1/2" and one 5 1/2" Rods connected together by means of Couplings. At its lower end it is journalled in a Double Arm Crank that is bolted to one of the transverse Angle Girders in the base as shown in Fig. 2. The Rod 9 extends from top to bottom of the Warehouse and is connected at its upper end with the Motor switch in the following manner.

The upper end of the Rod is journalled in a 1 1/2" Strip bolted to the Angle Girder 47a (Fig. 5) and is held in position by means of a Collar placed on the Rod against the face of the Strip. A Crank 46 secured to the end of the Rod is connected pivotally to one end of a 4 1/2" Strip 45 and the other end of this Strip is attached to an Angle Bracket that, in turn, is pivoted to the central arm of the Motor switch. It will readily be seen that movement of the control Rod is transmitted via the Crank 46 and Strip 45 to the Motor switch, with the result that the Motor may be either started, stopped or reversed as desired.

After the mechanism has been adjusted finally the roof may be placed in position and bolted to the Angle Girders 14.

Complete instructions for building the Meccano model Warehouse with Elevators are contained in Special Instruction Leaflet No. 31. Each unit of the Warehouse structure and elevator gear is described clearly, and the construction is further simplified by the inclusion of a number of half-tone illustrations of the various portions of the model. The leaflet may be obtained from any Meccano dealer, price 3d., or direct from Meccano Ltd., Old Swan, Liverpool, price 3d. post free. Remember to ask for Leaflet No. 31.

Flashlight Photographic Contest

Those of our readers who took part will be interested to see the results of Messrs. Johnson's Flashlight Photographic Competition that closed on 30th April:

First Prize, D. ALLEN (Leamington Spa); Second Prize, W. A. WALLIS (Lenton, Nottingham). Six Prizes each of 10/6: H. TAYLOR (Chelmsford); E. J. BULL (London, S.E.16); H. W. HILLIER (Maidstone); R. W. BARNES (Ilkerton); J. S. SPENCE (Edinburgh); G. C. BACKHOUSE (Harehills, Leeds). Six Consolation Prizes: L. MITCHELL (Sunderland); E. MOONEY (Burton-on-Trent); R. L. PLOWMAN (Enfield); A. E. HARDING (Leek); C. NEWBERRY (Hornsey, N.8); Miss A. DARBYSHIRE (Leeds).

Messrs. Johnson have two Daylight Paper Competitions running now, to close respectively on 31st July and 31st October. Any subject is eligible for the July competition but entries for the October competition must be Holiday snapshots.

A leaflet giving full details of the arrangements and prizes to be won will be forwarded, post free, to any reader who applies, mentioning the "M.M." to Johnson & Sons (Manufacturing Chemists) Ltd., Hendon Way, Hendon, London, N.W.4.

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New Meccano Models—(Continued from page 559)

Bolts to the extremities of two 4 1/2" Strips that are bolted together face to face to form the front axle. Two 1 1/2" x 1 1/2" Double Angle Strips 5 secure the 4 1/2" Strips to the side Girders of the model.

The constructional details of the crane proper will be made clear from the general view of the model (Fig. 6). The load is raised or lowered by turning a Crank Handle that is journalled in Flat Trunnions which, in turn, are bolted to the flanges of the Sector Plate that forms the base of the crane. The load is prevented from falling when the handle is released by means of a Pawl engaging a Ratchet Wheel mounted on the end of the Crank Handle; a Collar secured on the shanks of a Threaded Pin that is screwed into the boss of the Pawl, acts as a weight and keeps that Pawl in engagement with the teeth of the Ratchet Wheel.

The parts required to build the Breakdown Crane are as follows:—8 of No. 2; 2 of No. 2a; 2 of No. 3; 4 of No. 5; 2 of No. 6a; 2 of No. 8; 4 of No. 9; 7 of No. 10; 10 of No. 12; 1 of No. 15; 3 of No. 16; 3 of No. 17; 4 of No. 18a; 1 of No. 19s; 4 of No. 20a; 2 of No. 20b; 1 of No. 21; 1 of No. 22; 2 of No. 22a; 2 of No. 24; 1 of No. 26; 1 of No. 28; 1 of No. 32; 8 of No. 35; 94 of No. 37; 7 of No. 38; 2 of No. 48; 1 of No. 48a; 3 of No. 48b; 1 of No. 52; 4 of No. 53; 2 of No. 54; 1 of No. 57; 10 of No. 59; 1 of No. 62; 3 of No. 63; 2 of No. 77; 2 of No. 90; 2 of No. 90a; 4 of No. 111c; 1 of No. 115; 1 of No. 116a; 2 of No. 126a; 4 of No. 142a; 1 of No. 147a; 1 of No. 147b; 1 of No. 148; 2 of No. 165.

Famous Inventions—(Continued from page 527)

composition of clays. He was not in any sense an expert chemist, but he had acquired a considerable chemical knowledge as a result of incessant experiments. One of his favourite expressions was "everything yields to experiment," and he repeatedly proved the truth of his words.

About the year 1790 he began a gradual retirement from business. His health at that time was not good, and it slowly became worse. Towards the end of 1794 he became seriously ill, and died on 3rd January of the following year at the age of 64.

Wedgwood was a great man in the true sense of the word. The manner in which he worked his way from apprentice to master potter proves that he was possessed of ambition and tremendous energy. He was a great business man, but his aim in life was to achieve success in his work rather than to amass money. He started out with high ideals and never lost them; and nothing would ever induce him to produce work of inferior quality for the sake of a bigger profit. He has been well described as a man of "great heart, great mind, and great purpose."

It is interesting to note that the Wedgwood factory still remains at Etruria and is carried on by direct descendants of its founder. Its history has been singularly peaceful and prosperous, and in the 160 years of its existence there has never been a strike. Among its 900 employees there are very many whose fathers, grandfathers and great grandfathers spent their working lives in maintaining the high traditions set up by Josiah Wedgwood.

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