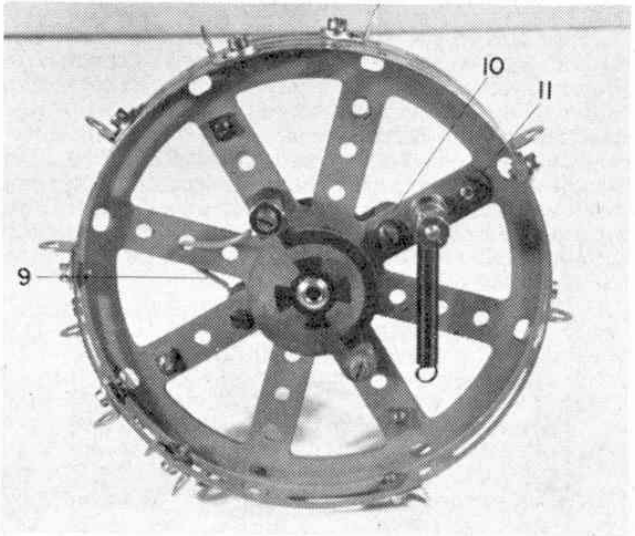
STRIKE OUT

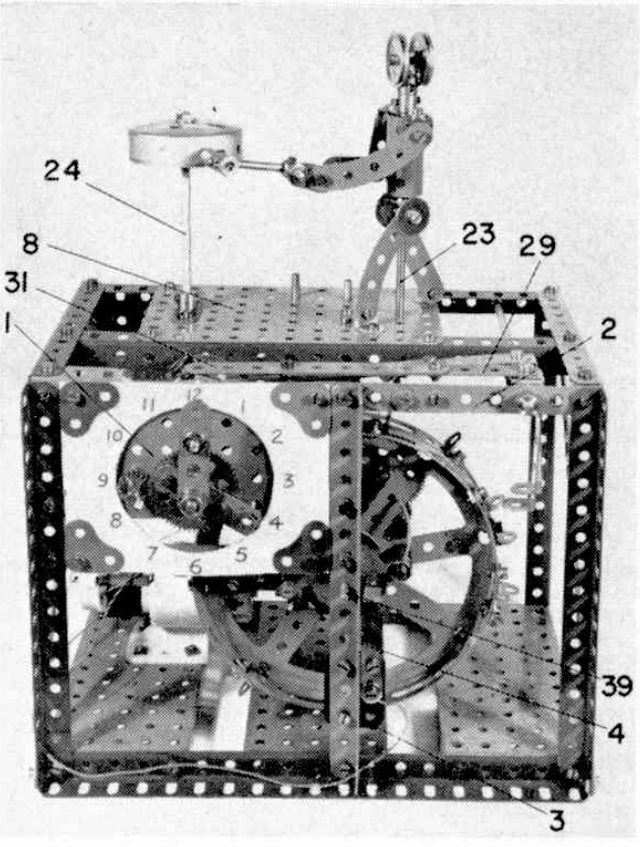
. . . with this ingenious Clock-striking unit designed and built by RON FAIL. Photos by BERT LOVE

CLOCK-BUILDING in Meccano (writes Spanner) is a section of the hobby with a large and extremely keen following. Meccano Limited, themselves, have produced a considerable number of clocks over the years, many of which have been featured in the M.M. Few of these, however, have been striking or chiming examples simply because it has always been difficult to build-up the necessary strike-mechanism with standard Meccano parts and what striking clocks we have featured in these pages have usually included a specially-made "snail" cam. Now, though, this unfortunate state of affairs has at last finished, thanks to the designing skill of Mr. Ron Fail of Bedford, who has invented the completely-standard Meccano Clock-striking Unit described here.

Although he would be first to disagree with me, Ron, to my mind, is one of the foremost Meccano clock-builders in the world in that he aims at simplicity combined with reliability and accurate time-keeping. He has not deviated far from this policy in his Striking Unit, which has the added advantage of being so designed that its principles can be easily incorporated in most other Meccano Clocks, be they simple or highly complex in design. To avoid any misunderstanding, incidentally, I must stress at this point that I have nothing but admiration for the skill of those builders who specialise in highly complex clocks and, to be quite honest, few things hold my interest more than the sight of such a clock in action. To enable us to be of help to the majority of readers, however, simplicity in models comes second only to realism and Ron is an expert in both these fields. Having said this, it leaves us only to reprint the detailed building instructions Ron has supplied.



The composite locking plate as it appears when removed from the mechanism. Note the use of Elektrikit Commutators.



Clock-builders can ring out the hours with this clock-striking mechanism designed and built by Ron Fail of Bedford.

Main frame

Beginning with the main frame, a base is built up from a pair of 9½ in. Angle Girders joined by three 5½ × 2½ in. Flanged Plates. Six vertically-mounted 7½ in. Angle Girders are then attached to this base, four at the corners and two more in the positions shown, the top itself consisting of 5½ in. Angle Girders connected by 9½ in. Angle Girders, the former braced by 9½ in. Strips, fitted diagonally. Note however that the top front member of the framework is not an Angle Girder but is produced from a 5½ × 2½ in. Flat Plate 1 extended by Strips 2. A 1½ in. Insulating Flat Girder 3 carrying a 2 in. radius Wiper Arm 4 is also fixed to one of the front 7½ in. Girders, while, to the back are fitted two 5½ in. Strips 5 and 6 and a Double Arm Crank 7. A 5½ × 3½ in. Flat Plate 8 will be fitted later.

Locking plate

Moving onto the locking plate, this consists of a pair of 5½ in. Hub Discs bolted together, with a 1⅜ in. Bush Wheel positioned at the centre. Flat Commutators are attached to both sides of the assembly by means of Insulating Spacers and suitable Bolts and Washers, then the conducting surfaces of the two Commutators are connected by a short piece of Connecting Wire 9. A Double Arm Crank 10, carrying a 1 in. Rod 11, is bolted to one spoke of the Hub Discs whereas twelve ½ × ½ in. Angle Brackets are bolted to the rims of the Discs. These Brackets control the striking and must be fitted in a special way: they are arranged alternately on the rims of the two Hub Discs at intervals of 1/78, 2/78, 3/78, etc., up to 12/78 of the circumference. In practice, final

adjustment of the positions is done after the mechanism has been assembled.

Epicyclic gear

An epicyclic carrier is made from two 6-hole Bush Wheels 12 connected rigidly by two 1⅛ in. Bolts 13, these bolts also holding two 3½ in. Strips 14 spaced from the Bush Wheels by one Washer. Eight Fishplates 15 are bolted to the remaining holes in the Bush Wheels, using the slotted holes in the Fishplates to adjust their positions so that the gearing meshes properly. A Crank 16 carrying a 2½ in. Rod 17 is secured to the end of one 3½ in. Strip, to the other end of which, a 1½ in. radius Wiper Arm 18 is attached by a ½ in. Bolt and Nuts (no insulation is needed). Journalled in one pair of Fishplates is a 1½ in. Rod carrying a 7/16 in. Pinion 19, on the same side of the carrier as the Wiper Arm, and a ½ in. Pinion 20. A second 1½ in. Rod is journalled in the adjacent pair of Fishplates, this Rod carrying a ½ in. Pinion 21 and a 1½ in. Gear Wheel 22. An identical set of gears is fitted in the diametrically opposite holes in the other Fishplates.

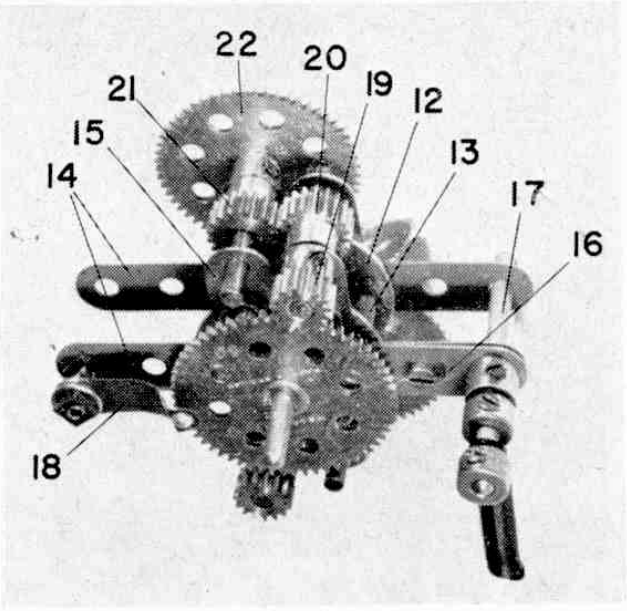
Manikin

The actual striking motion is performed by a hammer-weilding "strong man" produced from one 2½ in. Strip and one 2½ in. Curved Strip attached to Flat Plate 8 by Angle Brackets to serve as legs, the tops being joined by a Large Fork Piece. Journalled in this Fork Piece and in Plate 8 is a 6½ in. Rod 23 to which a Double Arm Crank is secured to form the shoulders. Arms are supplied by a 2½ in. Curved Strip and a couple of 1½ in. Strips, attached to the shoulders by Angle Brackets. The head consists of a Coupling with two 1 in. loose Pulleys bolted to it, while the body is simply a Sleeve Piece located by two Chimney Adaptors. Attached to the arms by Handrail Supports is the hammer, consisting of a 3 in. Rod on which a Coupling is fixed.

Next, a 4 in. Rod 24 carrying a Rod Socket is mounted in the boss of a Double Arm Crank bolted to Plate 8. An Elektrikit Bell is secured to the Rod Socket, as can be seen. Beneath Plate 8, Rod 23 is fitted with a Crank 25 and a Coupling 26, the latter holding a 3 in. Rod 27. A Tension Spring is attached to the Crank by means of a Pivot Bolt, the free end of the Spring being hooked to an Angle Bracket. A 1 × ½ in. Angle Bracket 28 is bolted to the Plate to act as a stop for the crank, holding the hammer about ⅛ in. from the Bell.

Release mechanism

Each of the two release levers is made by bolting a 4½ in. Strip 29 to the end of a 2½ × ½ in. Double Angle Strip 30, the securing Bolt also holding a Double Bracket in place. Each 4½ in. Strip is then extended three holes by another 4½ in. Strip 31, after which the levers are mounted, by means of the Double Brackets, on a 6½ in. Rod in the main frame, being located by Washers and Collars. Although it is not strictly part of the striking mechanism it is an advantage to fit clock hands and, if desired, a cardboard face. The necessary gearing has been described many times in *Meccano Magazine*, but returning to the present mechanism, a 6½ in. Rod 32 is arranged to turn at half the speed of the minute hand by means of a ¾ in. Pinion 33 and 50-teeth Gear Wheel 34. Rod 32 also carries a pair of identical cams 35, each made by bolting three ½ × ½ in. Angle Brackets to adjoining holes in a 6-hole Bush Wheel. The ends of the release levers rest on these cams which should be adjusted so that the

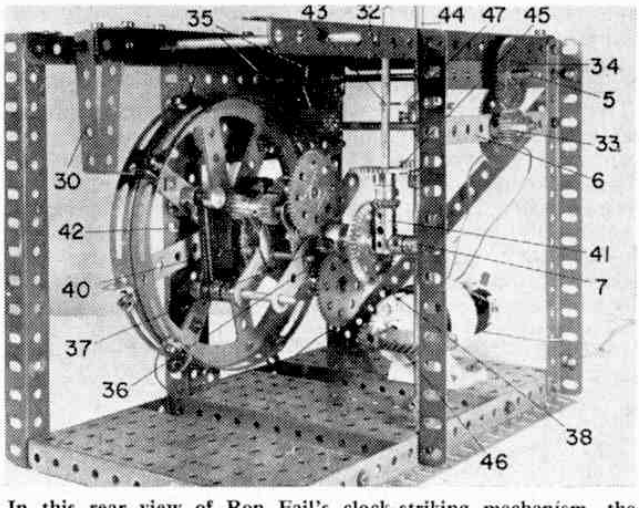


The epicyclic gear unit used in the mechanism to obtain the necessary ratio of 78 : 1, seventy-eight being the number of times a clock strikes in 12 hours.

levers drop alternately each time the minute hand is moved up to the hour.

Assembly

Before commencing assembly, one more small unit should be made, this consisting of a Socket Coupling 36 holding, at one end, a ½ in. Pinion 37 and, at the other end, a 1½ in. Bevel Gear 38, then most of the various sections of the mechanism are mounted on a 6½ in. Rod 39, fixed in Double Arm Crank 7 and



In this rear view of Ron Fail's clock-striking mechanism, the end structure has been removed to show the locking plate and epicyclic gear unit in position.

supported in the front 7½ in. Angle Girder of the framework. Starting at the front, the following items are fitted, in order, on the Rod: first, four Washers, then the locking plate, followed by five Washers and a 60-teeth Gear 40 (with its boss to the rear). This Gear is the only component which is fixed to the Rod. Next comes the epicyclic gear, then two Washers and the Socket Coupling described above, followed by one Washer, a Coupling 41, and a Collar. Note that the

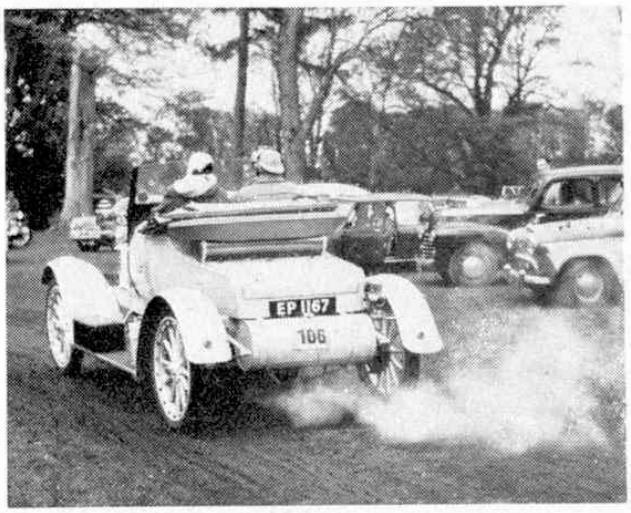
Continued on page 239

a flash-steam boiler and could get up steam much quicker but the disadvantage of this system was that it would not produce steam after the fire was out, whereas the other type of boiler would.

The invention of the electric starter probably sounded the death knell of the steam car. Until the introduction of this device, petrol engines had to be started by hand cranking and there were many people who preferred the long wait for steam, to the rigorous hand swinging with its attendant risk of a sprained wrist or worse. The electric starter changed all that and the American motorist, in a hurry then as now, turned his back on the steamers.

There were, however, a few people who still believed in steam. One such man was Abner Doble. Although he had built several steam cars before, it was in the late twenties and early thirties that his best and most famous cars were built. These huge cars have been called the Rolls-Royce of steam. Not unlike the Rolls-Royce in appearance they were the ultimate in perfection. By the mere turn of a switch steam could be obtained in 22 seconds, they would climb any gradient where traction could be obtained, and all in complete silence.

For those who still believe in the power of steam there is, in America, a company that still builds steam cars. The Keen Steamliner is a good looking two seater possessing outstanding acceleration. The ultimate in steam cars, however, may still be in the future. The atomic car, if and when it comes, will surely be steam powered for the only way that we can use atomic energy for power is by converting it to steam.



Rear view of a Stanley. The exhaust is of course steam, and not a sign of excessive oil burning !

CLOCK STRIKING MECHANISM

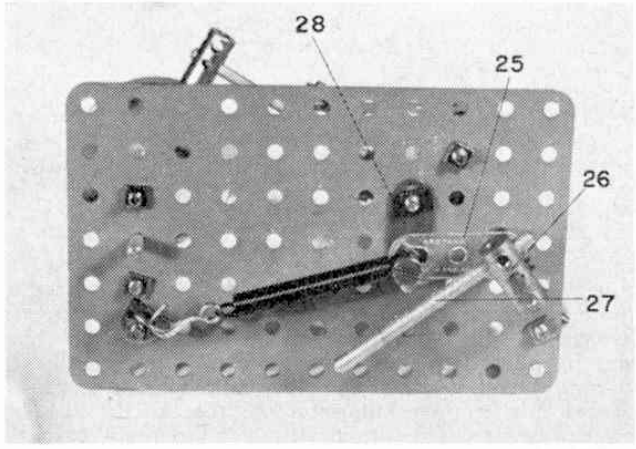
Continued from page 247

Rod passes through the end transverse bore of Coupling 41. Rod 11 on the locking plate and Rod 17 on the epicyclic carrier are connected by a Tension Spring 42 located by Collars, then the Wiper Arm on the carrier is adjusted to bear on the 180 deg. sector of the Commutator on the locking plate. The mechanism must be so arranged that, when the spring is relaxed, the Wiper is just on the conducting sector of the Commutator and, with a slight tension in the spring, the Wiper moves on to the insulating sector. Wiper Arm 4, on the other hand, is adjusted to bear on the continuous track of its commutator.

Journalled in Coupling 41 and Plate 8 is a 4 in. Rod carrying a ½ in. Bevel Gear and a 50-teeth Gear. Alongside Rod 43 is fitted an 8 in. Rod 44 fitted with a ¾ in. Pinion 45, a 1½ in. Helical Gear 46 and, near the top, a Bush Wheel 47 with a Threaded Pin fixed in one hole. This Pin actuates the manikin by acting on Rod 27.

Finally, a Power Drive Unit, fitted with a ½ in. Helical Gear on its output shaft, is bolted to the base. A 4½ volt battery is quite sufficient to drive the mechanism with a Power Drive gear ratio of 30 : 1 or 60 : 1. One Motor lead is connected to one battery terminal, the other motor lead being connected to Wiper Arm 4. The remaining battery terminal is connected to any convenient point on the main frame. It is important to remember, however, that the motor must be run only in the direction which causes the locking plate to revolve clockwise when viewed from the front, then it remains only to make the final adjustments to the brackets on the locking plate so that the correct number of strikes are obtained.

Postscript: The rather complicated epicyclic gear included in this Unit is necessary to obtain a ratio of 13 : 1 which, in combination with an additional 6 : 1 ratio, gives a final ratio of 78 : 1—the number of strikes a clock makes in 12 hours. Also, the electro-mechanical servo device included has other applications which unfortunately cannot be gone into here.



An underside view of the Flat Plate on the top of which the " manikin " is mounted. Note the use of the Tension Spring.

PARTS REQUIRED

2—1a	1—14a	127—37a	1—115
3—2	2—15b	118—37b	1—116
4—2a	2—16a	88—38	2—118
3—3	1—16b	2—38d	4—133a
2—5	1—17	2—43	2—136
2—6	4—18a	2—48a	1—147b
2—6a	1—18b	3—52	1—163
4—8a	2—22a	1—52a	2—164
6—8b	2—24	1—57d	1—171
2—9	4—24b	12—59	1—179
1—9f	2—25	3—62	1—211a
8—10	6—26	4—62b	1—211b
2—11	3—26c	5—63	1—508
25—12	2—27	1—70	1—531
1—12b	3—27a	2—90	1—533
2—12c	2—27d	1—111a	2—551
1—13a	1—30a	5—111c	1—562
5—14	1—30c	2—111d	4—564

1—Power Drive Unit.

(266) Clock Escapement

(A. Sheppard, Brighton)

The escapement mechanism shown in Fig. 266 is particularly suitable for use in small models such as mantel clocks. The driving spindle of the Motor carries a 2½″ Gear engaging a ½″ Pinion on a secondary shaft, which carries the two Ratchet Wheels 1 mounted with their Bosses butted together. A short Rod journalled above the secondary shaft carries two Pawls 2 and 3, and a Coupling on the other end of the Rod holds a 2″ Rod hanging perpendicularly. On the lower end of this Rod a second Coupling is mounted at right-angles, and fitted with two 1″ Rods in the end transverse holes. The latter Rods engage Collars secured on the pendulum, which is suspended by means of a Pendulum Connection held in Strip Couplings.

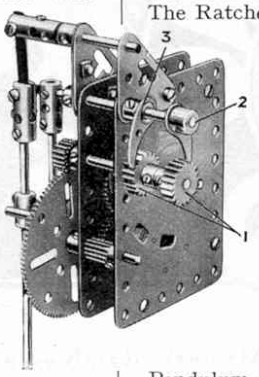


Fig. 266

The Pawls should be carefully adjusted so that it is not possible for them both to be clear of the Ratchets at the same time, as this would allow the Wheels to rotate freely. The Ratchet Wheels rotate in a clockwise direction so that the Pawl 3, when in engagement, prevents rotation of the secondary shaft. As the Pendulum swings over, this Pawl is released and the part 2 engages its respective Ratchet. In this case the movement of the Wheel is not stopped entirely and there is a tendency for it to continue to rotate, thus forcing the Pawl out of engagement. This helps the Pendulum to swing back until the Pawl 3 again engages its Ratchet. The positions of the Pawls in respect of the Pendulum is important, and also the positions of the teeth on the Ratchets in relation to each other. The most effective positions can be obtained after experimenting.

(267) Remote Control for Gear-Box

(L. F. Atkinson, Croydon)

There is much fascination to be derived from controlling a model without touching it by hand, but by operating a switchboard some distance away. The realism of a working model is increased enormously. The Meccano Electric Motor may be stopped and started from any distance merely by operation of a switch completing the electric circuit, and by means of the remote control device shown in Fig. 267 it can be made to go through all its movements without being touched. The device is intended for operating a two-speed gear-box from a distance, and in a model with several movements it will be necessary to fit a controller for each movement. In a model Crane, for instance, hoisting, luffing and slewing operations could be carried out at will by operating the appropriate switches.

The two-speed gear-box shown in the illustration is mounted between 2½″ × 2½″ Flat Plates and the Motor side plates. The drive from the armature shaft of the Motor is conveyed through Sprocket gearing to a 1½″ Rod journalled between one of the Motor side plates and a 2½″ × 2½″ Flat Plate. The Rod carries a ½″ Pinion that is constantly in mesh with the Gear 1 on a sliding 3½″ Rod, which carries also a ½″ Pinion 2 and a ¾″ Pinion 3. A Collar at each end limits its longitudinal movement. The final driven shaft consists of a further 1½″ Rod journalled co-axially with the first in the opposite Motor side plate and Flat Plate. The Motor and Flat Plates should be carefully placed so that these two Rods are in proper alignment.

The selector consists of a Crank 6 the web of which fits between the Gear 1 and Pinion 2, being spaced from the Gear by Washers. The boss of the Crank is fitted on a sliding 4½″ Rod the ends of which project beyond the Plates and are inserted in the solenoids 4 and 5. These are clamped in position by 2½″ Strips secured at each end to Double Brackets, and the lower Strips carry Angle Brackets centering the solenoids. Careful placing is necessary to allow free movement of the sliding Rod carrying the selector 6.

The gear control switch is shown near the Motor reversing switch for convenience, but this can be taken to any position and wired up accordingly. A 1″ Triangular Plate is held on a ¾″ Bolt 7 by two Nuts, and two further Nuts hold it in position on the Motor. Two 6BA Bolts 8 and 9 are insulated from the Triangular Plates and form studs for the contact arm made from a 1½″ Strip mounted on the Bolt 7, and held against the heads of the 6BA Bolts by a Compression Spring. The Bolt 8 is connected to one wire of the solenoid 4, the remaining wire of which goes to one of the Motor terminals. The same terminal is connected to the solenoid 5, which is wired to the Bolt 9. To connect up, one of the Accumulator wires goes to the remaining Motor terminal and the other is "earthed" by connecting it to the frame. With the lever as shown the solenoid 5 is in series with the Motor and causes the Crank 6 to bring the Pinion 2 into mesh with the 57-teeth Gear, at the same time throwing the Pinion 3 out of engagement with its respective Gear. When the control lever is moved to the left to make contact with the Bolt 8 the solenoid 4 is energised, causing the Pinion 3 to engage its Gear Wheel. The Bobbins should not be wound to full capacity.

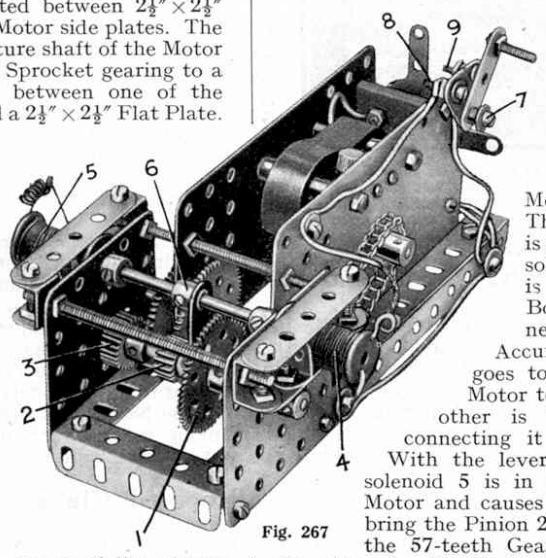


Fig. 267

Miscellaneous Suggestions

Under this heading "Spanner" replies to readers who submit interesting suggestions regarding new Meccano models or movements that he is unable to deal with more fully elsewhere. On occasion he offers comments and technical criticisms that, he trusts, will be accepted in the same spirit of mutual help in which they are advanced.

(M.147). A Novel Indicator for Cranes. In Cranes employing multi-sheave Pulley Blocks it is essential that the hoisting cord should always remain taut, otherwise it is likely to slip off the pulleys. When the pulley block reaches the ground the hoisting barrel should immediately cease paying out, but if the operator is unable to see the ground a short interval may elapse before he applies the brake.

L. Kent (Felixstowe) has devised an ingenious method of showing when the ground hook is relieved of its load, and at the same time keeping the cord taut if the drum pays out a little too much. The device consists of an Axle Rod pivoted near the centre to the jib, and carrying at its lower end a Worm or other suitable weight. An End Bearing at the upper extremity of the Rod carries a ½″ loose Pulley. The hoisting cord passes over the Pulley and the weight of the load hook should be sufficient to hold the lever in a position almost parallel to the jib. As soon as the hoisting cord is relieved of its weight when the Pulley block reaches the ground, the Worm at the end of the lever returns it to the vertical position, thus taking up the slack in the cord and giving the crane operator warning to apply the brake.


Fig. 268

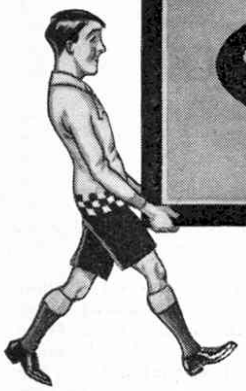
(M.148). Coupling for Sliding Shafts. The usual form of connection between a sliding and a fixed rod consists of two Bush Wheels, one of which is fitted with Threaded Pins that engage the holes in the other. Occasions sometimes arise when the diameter of the coupling prohibits its use, and J. V. Harding's (Edgbaston, Birmingham) sliding joint will be found useful in such cases. A 2″ Slotted Strip is secured to each side of a Coupling on the fixed rod, and a second Coupling carried on the end of the sliding shaft is fitted with two Set Screws, which pass through the slots in the Strips.

(268) A Meccano Yo-Yo

(J. H. Axbey, Slough, and others)

Many readers are no doubt familiar with the "Yo-Yo," and those who have not yet mastered the art of manipulating one will obtain much enjoyment from the model shown in Fig. 268. As will be seen, this consists of two Artillery Wheels (part No. 19a) mounted on a 1½″ Rod with their bosses outward. A piece of Cord about a yard long is tied between the Wheels.

To operate the device the Cord is wound up and the end held while the Wheels are allowed to drop. In doing so the Cord unwinds and causes the Wheels to rotate, but after reaching the lower end of the Cord their momentum causes the Cord to be wound up again and the device begins to ascend. With a little skill it can be made to climb to its original position.



Suggestions Section

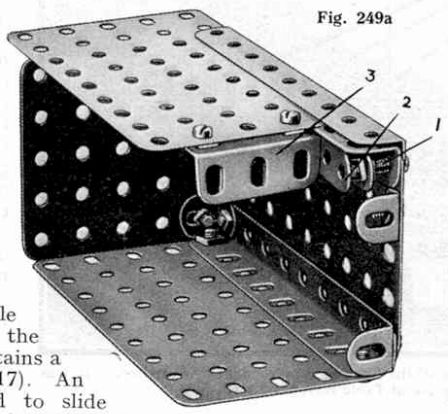
Edited by "Spanner"

The ideas printed in the "Suggestions Section" should prove a real help to thousands of Meccano enthusiasts. Often we receive letters from readers who describe how they have solved some knotty problem or evolved an interesting model after studying some of the ideas that have appeared. We shall always be pleased to receive further contributions for the "Suggestions Section." Cash payments are made for all Suggestions published (excluding those mentioned in the "Miscellaneous" Suggestions column). Contributions should be accompanied by clear photographs or drawings and should be addressed to "Spanner," c/o The "Meccano Magazine."

Results of Puzzle Box Contest

The Meccano Puzzle Box that was illustrated on these pages under Suggestion No. 249 has proved of great interest to model-builders. If readers refer to the illustration of the complete box it will be seen that this is built up of $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates, with a Plate of similar size forming the sliding lid which, when closed, cannot be re-opened unless the catch is released.

Fig. 249a



The puzzle lies in finding the catch. W. J. Langstaff (Boston, Lincs.), who originally submitted details of the box, uses a very ingenious mechanism to operate which the box has to be turned upside-down. A small rectangular box-like structure, built up from Angle Brackets, is attached to the side of the box and contains a Steel Ball (part No. 117). An Axle Rod is arranged to slide through the Brackets forming the lower half of the structure, and is secured to the lid of the box. When this is closed the Steel Ball occupies the lower half of its receptacle, and as soon as an attempt is made to open the lid, the end of the sliding Rod strikes the Ball. When the box is inverted the Steel Ball drops out of place and no longer prevents movement of the Rod, which is free to slide, thus allowing the lid to be opened. This mechanism is well thought out, but it has the disadvantages that the box can often be opened by accident, and that the contents of the box are likely to be deranged.

Many interesting schemes were submitted by competitors, in some cases the entire box being filled with complicated mechanism! Competitors were asked to devise an efficient mechanism combined with simplicity, and after careful examination of the entries it was decided to award the prize of 10/6 to G. W. Hutchinson (Abergele), whose lock is extremely compact and efficient, yet simple in operation.

Six prizes of a copy of "*Famous Trains*" by C. J. Allen have been awarded to the following competitors, whose ideas were considered to be of outstanding interest:—D. Caddy, Portsmouth; K. W. Cameron, Claughton, Birkenhead; B. Gentle, Cheshunt, Herts.; S. Desai, Navsari, India; R. Nicholas, Portsmouth; L. James, Cinderford. A number of Meccano Engineer's Pocket Books have also been awarded.

Hutchinson's solution to the problem is illustrated in Fig. 249a, which shows the box with two of the Flat Plates removed. The catch consists of two $4\frac{1}{2}''$ Strips secured together at one end by a Bolt passed through the corner hole of the $4\frac{1}{2}'' \times 2\frac{1}{2}''$ side Plate. The Strips are bent outward slightly and a further Bolt holds them together at the centre, but a Washer on the Bolt shank is placed between the two Strips. The inner Strip carries the $\frac{1}{2}''$ Bolt 1, which is slidable in the side Plate, but the Bolt should not protrude beyond the Strip 2 that forms the catch. When the lid is slid forward to close, the $1\frac{1}{2}''$ Angle Girder 3 forces the catch back and it springs into position again immediately the lid is closed. The Girder is spaced from the lid by Nuts on the shanks of the securing Bolts, thus allowing the lid to slide freely. Careful examination of the box is necessary to enable it to be opened if the solution is not known, and if the box is lined with paper, so that the mechanism cannot be observed, the difficulty of the task is increased.

(265) Electric Horn

(J. Windsor, Birmingham)

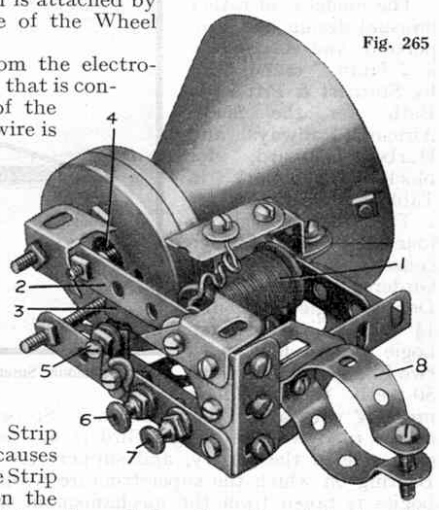
A warning device of some kind is a necessary accessory for all vehicles, so that other road users can be made aware of their presence. No doubt a large percentage of readers are cyclists, and most of them will employ a bell to warn others of their approach. Our contributor, however, is of opinion that a bell does not make sufficient noise, and so he has decided to use a Meccano Electric Horn for the purpose. The device is shown in Fig. 265, and although its efficiency is doubtful when subjected to the severe jolting caused by rough roads, it is likely to be of use for numerous other purposes to which an electric bell or buzzer can be put. The Clip 8 can be removed if necessary, so that the model can be secured in position on a board, etc., by means of Wood Screws.

Angle Girders are used in the construction of the frame, and to make these quite rigid a Trunnion and a 1" Corner Bracket are employed. The Clip 8 consists of a $4\frac{1}{2}''$ Strip curved to fit the top tube of the bicycle. In curving the Strip it is a good plan to obtain a rod or pipe of the correct size and shape the Strip round this.

The electro-magnet 1 is formed from a Bobbin wound with No. 26 gauge cotton-covered wire. A Pole Piece inserted in the centre of the Bobbin secures it to a $1\frac{1}{2}''$ Angle Girder to which also an Angle Bracket is fixed. Reversed Angle Brackets and 2" Strips attach this Girder to the 3" Girders, one of which has been cut away in the illustration to show the mechanism more clearly. The Strip 2 is attached to the frame by an Angle Bracket, and a Pendulum Connection 3 is secured to the Strip which, being held at one end only, easily vibrates. The Silver Tipped Contact Screw 5 is passed through the centre hole of a $1\frac{1}{2}''$ Strip that connects the 3" Angle Girders, but is insulated from the Strip by fibre Bushes and Washers.

Two Wheel Flanges clamp the metal diaphragm, which is a circular disc of thin sheet metal. Three holes are drilled in this, two to take the 2" Screwed Rods that hold the diaphragm in position, and the third in the centre for securing the Bolt 4. The Screwed Rods clamp the two Wheel Flanges together but should not foul the diaphragm. A suitable horn is cut from a piece of sheet metal or cardboard and is attached by Angle Brackets to one of the Wheel Flanges.

Fig. 265



One of the wires from the electro-magnet 1 is "earthed," that is connected to the frame of the model; and the other wire is led to the insulated Terminal 7. The Contact Screw 5 is connected to the Terminal 6, which is also insulated from the frame. The Pendulum Connection 3 normally makes contact with the tip of the Screw 5, thus completing the electric circuit and energising the magnet, which attracts the Strip 2 towards it. This causes the Bolt at the end of the Strip to strike the Bolt 4 on the diaphragm. Immediately the Strip is attracted to the magnet, the Pendulum Connection 3 also moves forward and so breaks contact. The Strip then moves back to its normal position and the cycle of operations is repeated in rapid succession. The result is that the Bolt 4 receives a series of blows, the noise being amplified by the horn.