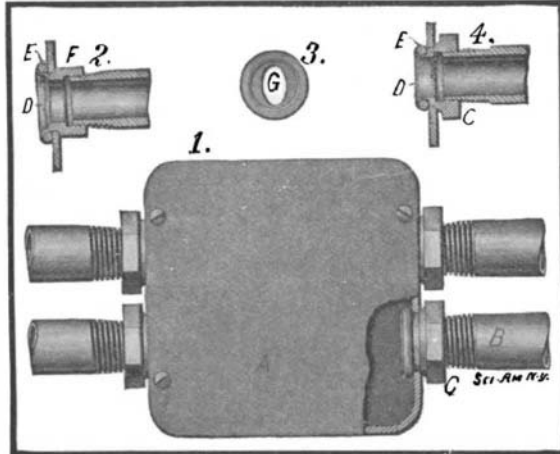


**COMBINED NUT LOCK AND BUSHING FOR CONNECTION BOXES.**

The invention which we illustrate herewith shows an improved method of connecting the ends of pipes to connection boxes, such as are used in electric wiring. The pipes are connected in such manner as to

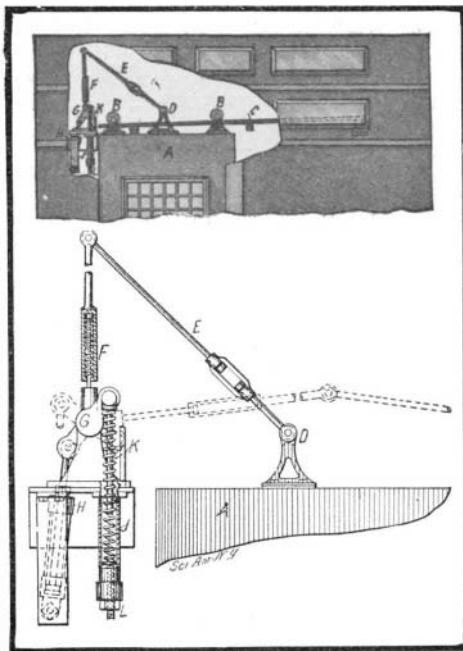


**COMBINED NUT LOCK AND BUSHING FOR CONNECTION BOXES.**

permit of rotation and at the same time to insure good electrical contact, in case it be desired to use the pipe as a return for any stray electric currents. The method of attaching the pipe to the box consists in the use of a device such as illustrated at C. This comprises a hexagonal member, interiorly threaded to receive the threaded end of a pipe B. The hexagonal member is formed with a tubular extension, adapted to fit in an opening in the wall of a connection box A. An annular flange D is formed on the end of this extension. The device is made fast to the box by placing a ring over the flange, and bending the latter back against the ring. By applying a wrench to the hexagonal part, the device may be rotated and threaded onto the pipe. Fig. 2 shows a slight modification, consisting of a tubular member F, in place of the hexagonal member C. An oval opening is formed in this member, as indicated at G in Fig. 3, so that when it is desired to connect or disconnect the pipe, the member F may be rotated by inserting a screw driver or any flat tool in the oval aperture. The rounded inner edge of the connection prevents wearing or cutting of the conductors which pass through the pipe. A patent on this device has been granted to Mr. J. S. Ritter and Dr. George F. Hummel, Ninth and Linden Streets, Allentown, Pa.

**DOOR CHECK AND CLOSER.**

In the operation of automatic elevators, which are usually controlled by means of push buttons on the different floors, it is essential that the doors be closed after leaving the elevator, as otherwise the circuit is left open, and it is impossible for any one on another floor to bring the elevator to him. In order to in-



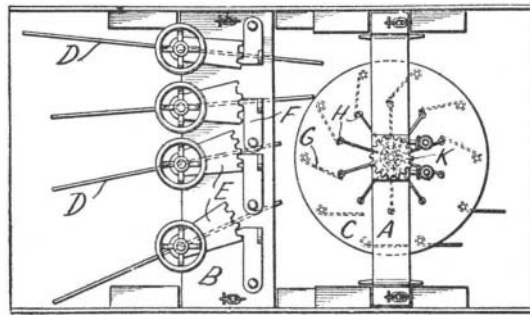
**DOOR CHECK AND CLOSER.**

sure the proper closing of the door, the mechanism illustrated in the accompanying engraving has been devised. The door of the elevator shaft is indicated at A, suspended from rollers B, which travel on an inclined track C. At one side is the closing mechanism, which is connected to the door A by means of a toggle lever E. In order to reduce the dimensions of this

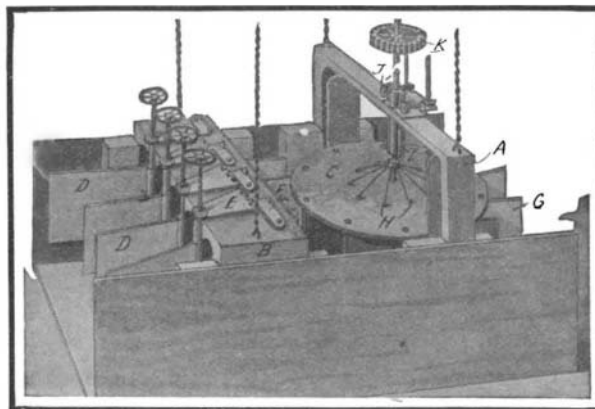
lever, one of the toggle members is made to telescope, as indicated at F, a spring serving to hold the member in its telescoped position. When the door is open, the toggle lever assumes the position illustrated by dotted lines. In swinging to this extended position, the two cranks G, which are fixed to the telescoping member of the lever, are swung on their axis, one of the cranks depressing a spring-pressed plunger in the cylinder J, and the other crank lifting a plunger in an oil cylinder H. The plunger in the latter cylinder is provided with a valve, which permits the oil in the cylinder H to flow freely through perforations in the plunger when the latter is lifted. On releasing the door A, the spring K serves to return the toggle lever to its normal position, drawing the door closed, while the oil in the cylinder H retards the plunger and cushions the movement to prevent concussion of the door when closing. This construction insures the closing of the door at all times, except when it is held open by the operator of the elevator. The mechanism is also applicable to any other type of elevator system, in which it is desired to insure positive closing of the doors without noise. The inventor of this elevator door closer is Mr. Joseph Fairhall, Jr., Danville, Ill.

**WATER CURRENT MOTOR.**

Pictured in the accompanying engraving is a water motor such as is used in streams and rivers for developing power. The motor is of the type provided with movable wings and it is furnished with means for controlling the position of the wings so as to enable the stopping or reversal of the wheel to be effected readily. The mechanism is carried in a flume which is lowered into the moving water. On the up-



Plan view of the water-current motor.



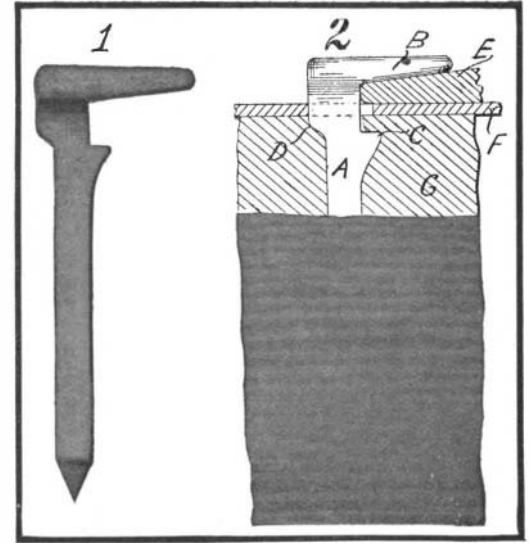
WATER CURRENT MOTOR.

position to direct the water against the vanes of the water wheel. The water wheel is supported in a frame A, which is suspended in such manner that it may be raised or lowered at will. Similarly, the wings are carried in a suspended frame B. The wings D are mounted on vertical shafts, provided with hand wheels at their upper ends. Secured to each shaft is a toothed sector E, the teeth of which are adapted to be engaged by dogs F. In this way they may be locked at any desired angle, so as to throw the water to one side or the other of the wheel C, depending upon the direction of rotation desired. The blades G of the wheel C, are pivoted at their outer ends, while their inner ends are free to swing against the stop pins H. The stop pins H are connected to a sleeve which is adapted to slide on the shaft of the motor wheel. This sleeve carries a rack I, engaged by pinions J, which may be operated by any suitable mechanism to lift the sleeve and raise the pins H out of engagement with the blades G. Thus, when it is desired to stop the wheel, it is merely necessary to raise the pins, permitting the vanes to swing free with the current. To reverse the wheel it is first stopped by withdrawing the pins, then the wings D are set to the proper angle, after which the pins are lowered once more and the wheel is turned by any suitable mechanism acting on the gear K, until the blades catch the current. The inventor of this improved water current motor is Mr. Asahel A. Porter, 329 North Willow Street, Waterbury, Conn.

**IMPROVED RAILWAY SPIKE.**

The railroad spike illustrated in the accompanying engraving is of such a design as to prevent it from working out of the cross-tie when in use. It is provided with an inclined shoulder which, when the spike

is driven into the wood, forces it inward, or toward the rail. A second shoulder or projection on the inner side of the spike is thus made to bite into the wood, and securely hold the spike in place. In the illustration the head of the spike A is indicated at B. The head is flat and its lower face is inclined so that it will fit snugly over the lower flange of the rail. The inclined shoulder, referred to above, is indicated

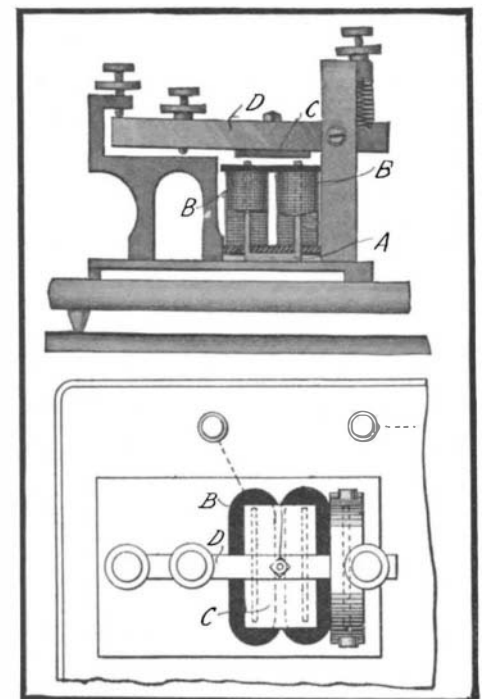


IMPROVED RAIL SPIKE.

at D, while on the opposite side is the projection C. The spike is designed to take advantage of the resilience of the wood of the tie G. It is started with its inner face about an eighth of an inch from the edge of the rail flange E. When the shoulder C engages the rail flange, the head of the spike springs back, permitting it to pass, and when the inclined shoulder D engages the tie plate F, the upper end of the spike is forced against the flange and the projection C is made to bite into the tie. If, in use, the spike works upward, the shoulder C will engage the under side of the rail flange, or the plate F, and thus be held in the tie. The result would be that while not giving perfect service in holding down the rail, the spike would at least keep the track from spreading. A patent on this railway spike is controlled by Mr. M. Sylvia, box 320, Goldfield, Nev.

**AN IMPROVED TELEGRAPH SOUNDER.**

A recent invention, which we illustrate herewith, provides an improved form of electro-magnet and armature, particularly adapted for use in telegraph sounders, to increase the sound produced by the apparatus. The sounder is mounted on a metal base supported only at the ends, so that it will act in the capacity of a sounding board. The core of the magnet consists of a flat plate bent to U-shape. Mounted on the two legs of this core are flat spools B, as indicated in the plan view. The armature lever D is provided with a broad armature plate C, adapted to be operated by the electro-magnets in the usual way. By using flat coils instead of the usual round coils, the poles of the magnet can be brought much closer together than usual, providing a much shorter path for the magnetic lines of force through the armature C.



AN IMPROVED TELEGRAPH SOUNDER.

In this way a louder sound is produced with the same battery, or if desired, the battery power can be cut down, for the sounder will make loud and sharp clicks with considerably reduced current. This type of magnet, while particularly designed for use in a sounder, should also be found useful in relays, electric bells, and various other forms of apparatus in which a mag-