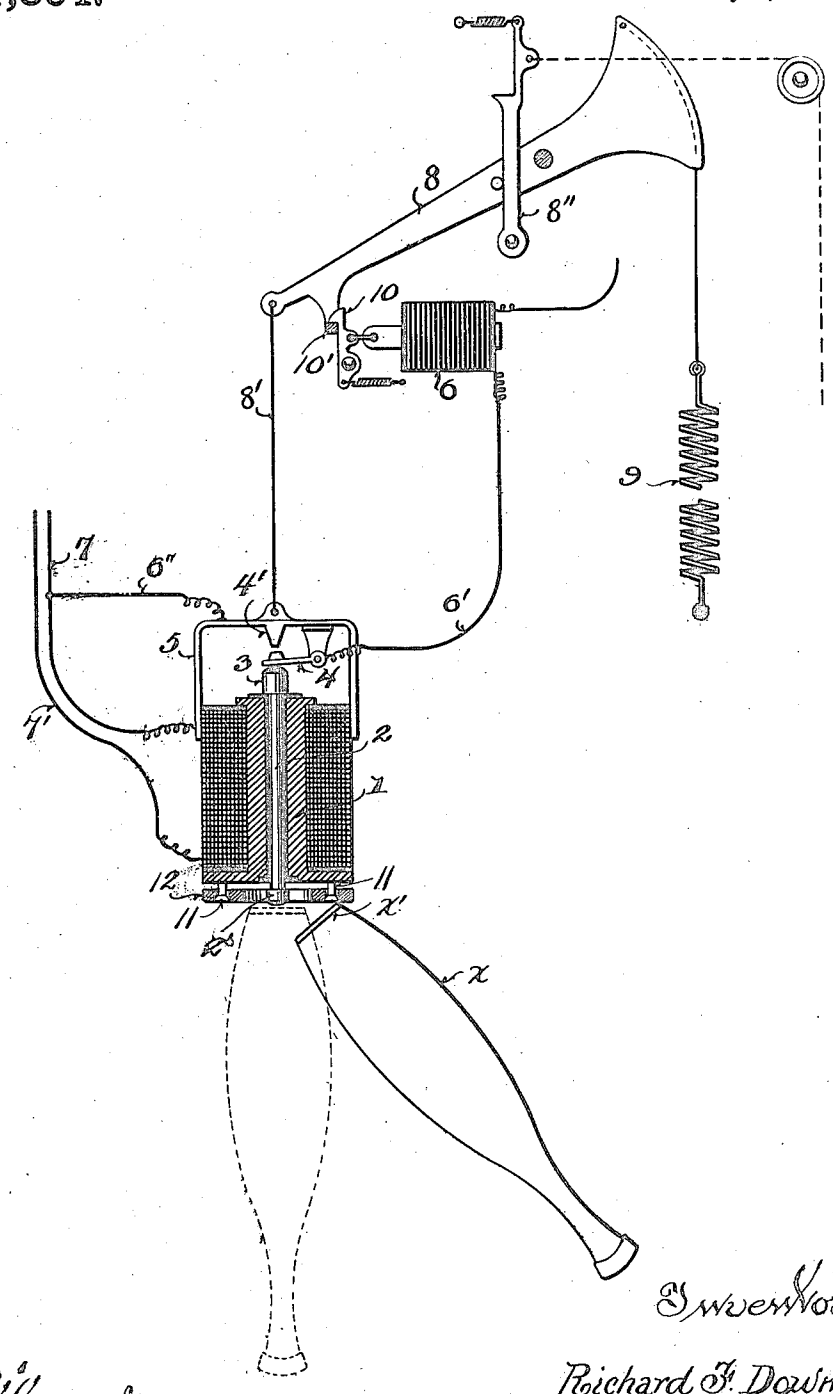
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MAGNETICALLY CONTROLLED COLLECTING MECHANISM.

APPLICATION FILED OCT. 9, 1916.

1,231,864. Patented July 3, 1917.



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MAGNETICALLY-CONTROLLED COLLECTING MECHANISM.

1,231,864. Specification of Letters Patent. Patented July 3, 1917.

Application filed October 9, 1916. Serial No. 124,623.

To all whom it may concern:

Be it known that I, RICHARD F. DOWNEY, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Magnetically-Controlled Collecting Mechanisms; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple, economical and effective positive means for controlling collector magnets which are employed as feelers to gather certain commodities from bulk. The invention particularly refers to magnets for collecting pins that are knocked down in the ordinary game of bowling and has especial reference to that type of pin-setting mechanism which is disclosed in my Patent No. 1181649, dated May 2, 1916. In said patent practice has demonstrated that the feeler or collector magnets, in traveling over the down pins or "dead wood", are liable at certain times when coming in contact with the metal shoes of the pins to prematurely release the trip mechanism and thus return to an elevated position without carrying a selected pin.

My present invention refers particularly to means for overcoming this result and embodies a safety appliance associated with a magnet so arranged that the said magnet will not be lifted by its motive force until a pin has been firmly seated by magnetic force at the head of the magnet.

With this object in view the invention consists in certain details of construction and combination of parts as described hereinafter and subsequently claimed.

The drawing illustrates a diagrammatic elevation of an apparatus embodying the features of my invention with parts broken away and in section to show certain details of construction more clearly.

Referring by characters to the drawing, 1 represents the core of a standard magnet which is bored centrally for the reception of a plunger rod 2, the same being insulated from the core, as shown. The upper end of the plunger rod carries an insulated tappet 3 which is adapted to engage a make and break arm 4 that is pivotally suspended from a bail 5, the same being suitably affixed to the magnet and serves to hold it in suspension. The arm 4 is insulated from the bail and when the plunger rod is forced upwardly, by means to be hereinafter described, the arm will engage a contact point 4′ that extends from the bail, whereby a circuit is closed through a solenoid 6. The solenoid 6 is connected by a conductor wire 6′ to the arm 4 and a second conductor wire 6″ connects the bail 5 with one of the feed wires 7 of the magnet, another feed wire 7′ being also connected to the magnet in any suitable manner. The magnet is suspended from a lever 8 by a runner or cable 8′ and a short arm of the lever 8 is connected to a coiled spring 9 which constitutes a motor, whereby the collector magnet is lifted.

As shown in the diagram, the coiled spring or motor is under tension and the lever 8 is drawn down and locked by a dog 10, the nose of which engages a latch bar 10′ which constitutes a part of the lever. In this suspended position the feeler magnet is upon a plane whereby it can be caused to move slowly over down pins, as indicated at x, the mechanism for moving the feeler magnet being not shown as it forms no part of my present invention.

The collecting end of the magnet core has extending therefrom pins 11, which support a guard ring 12 at two points, the ring being capable of slight oscillation upon its suspending pins 11 and by gravity it is held away from the head of the magnet. Thus as the magnet is caused to move over the down pins, this guard ring will have more or less compensating play, whereby its surface can more readily come in contact with the metal shoe x' of a pin.

The lower end of the plunger rod 2 is provided with a head 2′ which normally lies approximately flush with the lower surface of the ring and hence this head is protected by said ring, it being understood that the plunger rod head is suspended in this position by gravity. As the metallic shoe x' is brought into the field of the magnetic force due to the energization of the collector magnet, this force will cause the shod end of the pin to be drawn upwardly through the central aperture of the ring 12 and, in its upward travel, the butt of the pin will engage the head of the plunger rod and positively force the same upwardly, resulting in a closure of the contact members 4 and 4′ carried by the magnet bail 5. This action of the contact members will cause a certain

amount of current to travel through the wires 6'' and 6', whereby the solenoid 6 is energized, resulting in a quick release of the dog 10 from its locked position with relation to the motor lever 8, it being understood that said dog is in link connection with the core of the solenoid. Upon release of the motor arm 8 it is manifest that the spring 9 will exert pressure to immediately lift the collector magnet together with its pin load to a desired elevation, whereby it may be suitably placed by a mechanism which forms no part of my present invention. It is understood that, as soon as the arm 8 rises, it is locked in its elevated position by the nose of a spring-controlled latch bar 8'', which nose engages a pin that is carried by the arm 8.

When it is desired to reset the motor, the latch 8'' is operated to release the lever 8 and the collector magnet may be again moved downwardly to its position for selecting a pin, a series of which have been previously dropped into a receiver or well that usually embodies one of the features of a pin-setting mechanism.

It will be obvious that, owing to the construction described with reference to the lower face of the magnet, that the liability of a pin to become partially magnetized before the collecting magnet is elevated is eliminated, particularly because of the fact that the base of the pin must seat solidly within the ring before the magnet is tripped and elevated.

I claim:

1. A magnetically controlled collector mechanism comprising a magnet, a guard ring suspended from its face, a plunger extending through the core of the magnet, a current make and break mechanism controlled by the plunger rod, a motor-controlled mechanism for raising the magnet, and a solenoid in circuit with the make and break mechanism for tripping the motor-controlled mechanism.

2. A collector magnet having a hollow core, a mechanically controlled reciprocative plunger mounted therein, and a shiftable ring secured to the end of the magnet core adapted to serve as a shield for the plunger rod end.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

RICHARD F. DOWNEY.