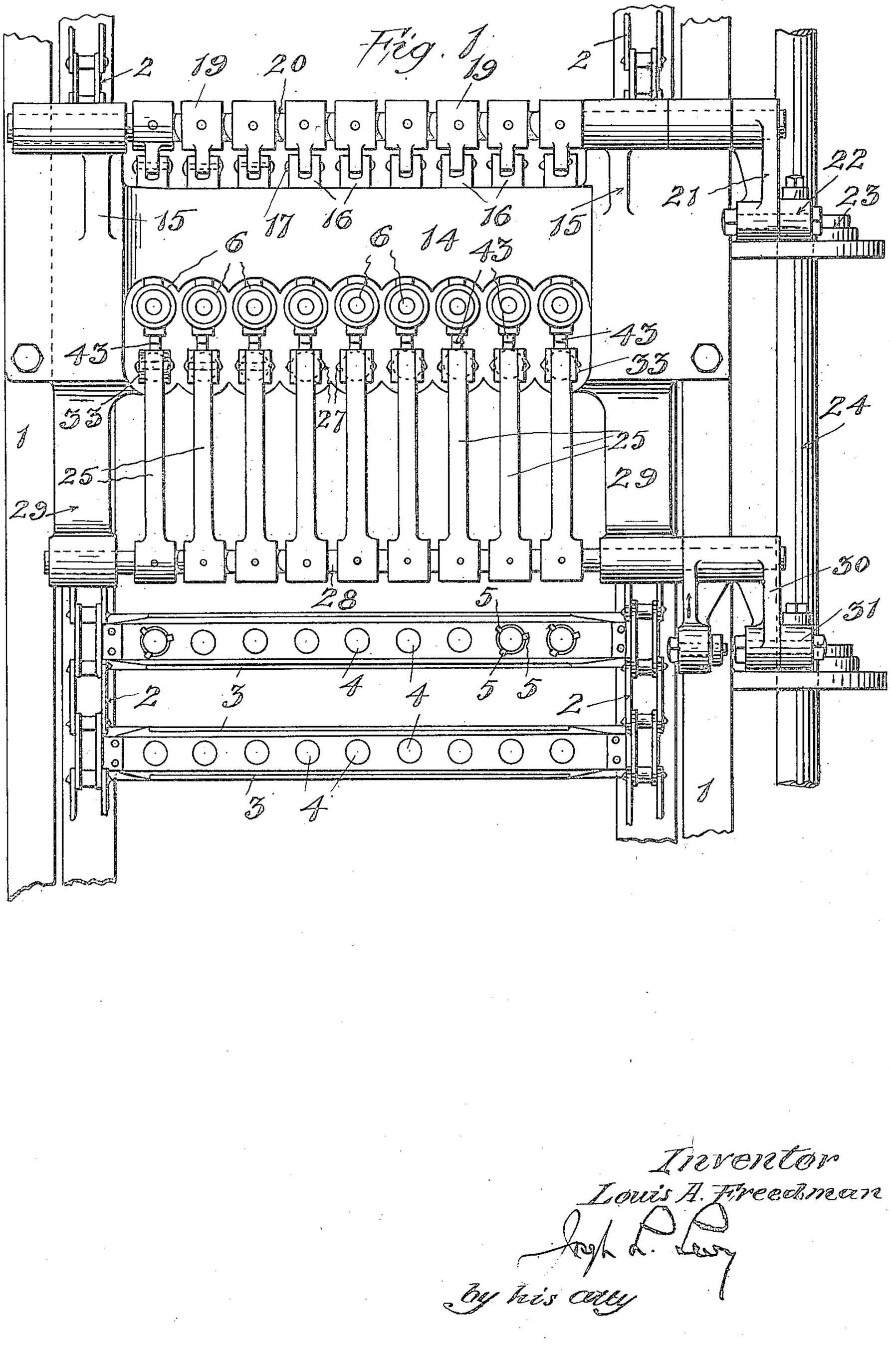
Jan. 2, 1923. 1,440,670

L. A. FREEDMAN.

DISK INSERTING MECHANISM.

ORIGINAL FILED DEC. 18, 1919. 2 SHEETS-SHEET 1

Fig. 1



Inventor
Louis A. Freedman
by his atty

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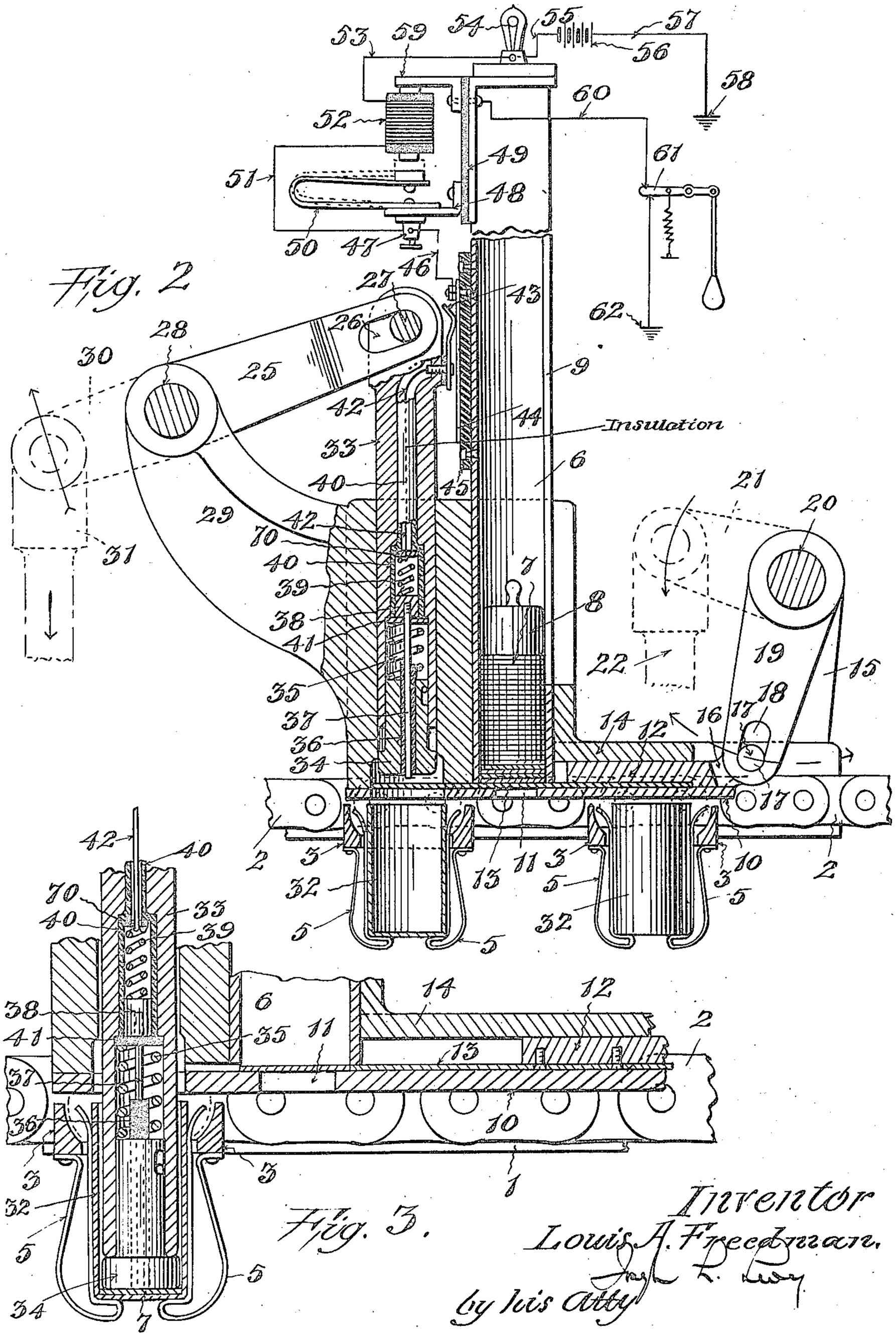

Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

LOUIS A. FREEDMAN, OF NEW YORK, N. Y.

DISK-INSERTING MECHANISM.

Original application filed May 13, 1916, Serial No. 97,441. Renewed May 27, 1922, Serial No. 564,219. Divided and this application filed December 18, 1919, Serial No. 345,916. Renewed September 26, 1922. Serial No. 590,747.

To all whom it may concern:

Be it known that I, LOUIS A. FREEDMAN, a citizen of the United States, and a resident of the city, county, and State of New York, have invented a certain new and useful Improvement in Disk-Inserting Mechanism, of which the following is a specification.

This invention relates to a machine for making dry batteries, and particularly to that part of the machine by which card board or other like disks are inserted into the battery shells prior to the filling of the shells with other material. This invention is also applicable to machines of other character in which disks are inserted.

The object of this invention, therefore, is to provide a machine of this character wherein these disks are positively and accurately inserted in the unfilled battery shells.

This application is a division of my copending application Serial No. 97,441, filed May 13th, 1916.

Reference is to be had to the accompanying drawings, forming a part hereof, in which

Figure 1 is a plan view of a portion of a battery making machine provided with my improvement;

Figure 2 is a vertical sectional view of my improved disk inserting mechanism; and

Figure 3 is a vertical sectional view of the lower part of the plunger and disk inserting mechanism.

Throughout the various views of the drawings, similar reference characters designate similar parts.

In the preferred embodiment of my invention, as disclosed in the accompanying drawing, 1 indicates the two longitudinal side members of the frame of the machine to which my improved disk inserting mechanism is adapted to be applied. This machine is preferably provided with a conveyor or other means for carrying the unfilled battery shells in which the disks are to be inserted. The conveyor or other means for carrying the unfilled battery shells to the disk inserting mechanism may be of any desired form, and I have shown herein a conveyor consisting of a pair of parallel chains 2 which run over sprockets placed at the ends of the machine. These chains are preferably driven over the sprockets by a suitable driving mechanism which acts with an intermittent movement, so that the disk inserting mechanism hereinafter described acts during the halts or pauses in the movement of the conveyor.

The chains 2 are connected by a number of transverse cross bars 3, which are spaced apart at the proper distance so that at each halt or pause in the movement of the conveyor one of these bars is directly beneath a series of plungers 33 of the disk inserting mechanism. Each of these cross bars is provided with a plurality of openings 4 in which sets of spring fingers 5 are mounted. Three of these fingers 5 comprise a set, and they are preferably mounted in each opening, and each set of three fingers thus forms a spring clip which embraces and holds a battery shell. Thus it will be seen that in the particular machine shown herein, each cross member 3 carries nine shells 32, with their mouths or open ends uppermost. This amount can be varied, and more or less shells can be carried by the conveyor, according to the particular arrangement of various machines to which my improved disk inserting mechanism may be applied.

The disk inserting mechanism has a plurality of elongated tubular disk-holding reservoirs or magazines 6. These magazines are arranged transversely of the machine and above the conveyor. For each shell on the cross member 3, one of these magazines 6 and a plunger mechanism is provided.

Each magazine consists of a vertically extending tubular member 6 in which the disks 7 are contained. The disks are of card board and are piled one on top of another within each of the magazines 6 and the pile of disks in each magazine is preferably surmounted by a weight 8 which presses upon the same and forces them down to the bottom of the magazine at all times. Each magazine is provided with a longitudinal elongated slot 9 through which the amount of disks in the magazine can be seen, and can be reached for removal should the occasion to remove them arise. The support 10 upon which the magazines 6 are mounted is provided with an opening 11, smaller than the diameter of the disks, beneath each magazine, allowing access to the disks from beneath should it be necessary.

The disks 7 are adapted to be removed singly from each magazine 6 to a position

beneath the disk inserting plunger by means of a slide 12. Each slide 12 is provided with a blade 13 which is slightly thinner than the thickness of the average disk 7. The blade 13 is mounted so that it can pass beneath the magazine 6 and slide the lowermost disk from the pile contained therein, and move said disk to a position beneath one of the disk inserting plungers 33 to be described. Each slide 12 runs in a guide 14 from which extends upwardly projecting shaft-bearing brackets 15 and the slide 12 is provided with an ear 16 on which is a pin 17 which engages a slot 18 in a crank 19 fixed on a shaft 20, rotatably mounted in the shaft bearing brackets 15. Fixed on one of the ends of this shaft 20 is an arm 21 which is connected to an adjustable link 22 which extends to and is driven by suitable cam mechanism 23 on the main shaft 24 of the machine.

The cam mechanism is so timed that the arm 21 is thrown forward and backward once for every revolution of the shaft 24 and at the proper time with regard to the movement of the plungers 33 to be described below. That is, when the plungers 33 descend the blades 13 are slid away from beneath them, and when the plungers move upwardly the blades 13 move a disk into position beneath each plunger so that upon their next downward movement the plungers will force the disks into the shells 32 held on the cross member of the conveyor.

By reason of the mechanism above described, it will be seen that the slide 12 on its forward movement brings the front end of its blade 13 into contact with the edge of the lowermost disk in the reservoir 6 and slides the disk from beneath the reservoir to a position below one of the plungers 33 which inserts the disk in a shell or receptacle in a manner to be described.

After a disk 7 has been moved to a position directly beneath the plunger 33, this plunger descends under the action of a crank 25. This crank is provided in one of its ends with a slot 26 which engages a pin 27 on the upper end of the plunger, thus forming a loose pivot connection between the crank 25 and the plunger. The crank 25 is fixed on a suitable shaft 28 which extends transversely of the machine, and is supported in brackets 29 at its ends. The shaft 28 is oscillated by means of an arm 30 connected to a link 31 which extends to and is reciprocated by suitable cam mechanism on the shaft 24 of the machine.

Each plunger 33 is preferably of tubular form and is provided with a suitable head 34, which is spring pressed by means of a spring 35 bearing downwardly on its inner end on the interior of the plunger. Passing longitudinally through the plunger head 34 is a sleeve of insulating material 36 and a rod or stem 37 is mounted to move slidably through the said sleeve 36. It will thus be seen that the head 34 of the plunger is insulated from the rod or stem 37. Fixed to the upper end of the rod or stem 37 is a metal block 38 against which bears a spring 39 causing the rod or stem 37 to be spring pressed and normally project a short distance below the end of the plunger head 34. The interior of the plunger 33 is provided with a lining of insulating material as at 40, 41.

The spring 39 which bears against the block 38 is connected to a wire 42 by means of a metal washer 70, and forms an electric contact between the spring 39 and the wire 42. The wire 42 passes through the insulation-lined interior of the plunger 33, and extends to a spring finger 43 which is in contact with and which slides against a metal plate 44 secured to a block of insulating material 45 fixed on the disk reservoir 6.

The plate 44 is connected to a wire 46 which runs to a binding post 47 supported by any suitable means, as a bracket 48. The bracket 48 is mounted at the upper end of the disk reservoir 6, but insulated therefrom by means of insulating material 49. The binding post 47 is electrically connected to a spring armature 50, and also by a wire 51 to a magnet 52 placed above the armature 50 so that when the magnet 52 is energized, in a manner hereinafter to be described, the armature 50 will be raised so as to contact with the core of the magnet 52 and thereby complete a circuit through the same for the purpose which will appear below.

The winding of the magnet 52 is connected to a wire 53 at the other extremity of the armature connected end 50 and the wire 53 runs to a lamp 54 mounted in any suitable way and at any convenient location, and preferably immediately above the reservoir 6 for which it is an indicator. The other terminal of the lamp 54 is connected by a wire 55 to a battery 56. The other terminal of the battery 56 is connected by a wire 57 to the ground as at 58 on the frame of the machine.

From the foregoing, the operation of my improved disk inserting mechanism will be readily understood. The conveyor in which shells are inserted by any suitable mechanism, moves these shells 32 along the length of the machine, and beneath the set of plungers 33 with an intermittent movement. As set forth heretofore there are as many plungers as there are shells in each cross member 3 of the conveyor. When a cross member 3 of the conveyor with its line of shells 32 reaches a position and comes to rest so that the shells are concentrically situated beneath the line of plungers, the plung-

ers move downwardly and insert the disks into the shells, the disks having been previously moved into position beneath the plungers by means of the blades 13 and attendant mechanism in the manner heretofore described. The disks are forced downwardly into the shells so that they contact with and rest upon the bottom of the same. This continues as long as the machine is in operation, or as long as there are disks in the magazines 6.

It will be apparent that should any one of the disk reservoirs 6 become empty or for any other reason the blade 13 on its motion towards the plunger fails to move a disk to a position beneath the plunger when the plunger descends, it will move downwardly into the mouth of a shell and strike the metallic bottom thereof. The end of the spring pressed rod 37 will thus resiliently contact with the bottom of the shell and thus close an electric grounding circuit which may be traced through the rod or stem 37, block 38, spring 39, washer 70, wire 42, finger 43, plate 44, wire 46, wire 51, magnet 52, wire 53, lamp 54, to the battery 56, and thence to the ground 58. By the closing of this circuit, the light 54 is thus caused to glow and remain lit, and simultaneously the armature 50 will be attracted to the core of the magnet 52 and when so attracted a circuit will be closed through a bracket 59 and thence through a wire 60 to a switch 61 and from there to a ground 62. The armature 50 is so arranged that it will stick in closed position, regardless of the fact that the stem 37 makes merely a momentary contact with the metallic bottom of the shell 32. By means of this armature closing arrangement, the circuit is held closed and the light continues to glow until the circuit is opened by manipulation of the switch 61. Thus it will be seen that by a single momentary resilient contact of the rod 37 with the metallic bottom of one of the shells on the conveyor, the lamp 54 will light and remain lit until extinguished by means of the manipulation of the switch 61.

The lamp 54 is thus used as an alarm to indicate that a disk reservoir is empty or that the plunger failed to insert a disk into a battery shell or for any other reason, which can be readily corrected by the operator. After the disks are inserted into the shells, the shells are carried along on the conveyor to other mechanism on the machine or to suitable means which eject them from the conveyor.

Having described my invention, what I claim is:

1. In a machine of the class described, a plunger, a disk containing magazine, means for supplying disks from the magazine to a position below the plunger, a conveyor below the plunger for carrying receptacles into which disks are adapted to be inserted by the plunger, a spring pressed stem extending through the plunger, a finger on the plunger, an electrical connection between said finger and stem, a plate against which the finger slides, and electrical means connected to said plate whereby a circuit is closed and a lamp ignited by contact of the spring pressed stem with the bottom of a receptacle to which no disk has been supplied.

2. In a machine of the class described, a plunger, means for supplying disks thereto, a conveyor movable beneath the plunger and carrying receptacles in position to receive disks from said plunger, said plunger having a central opening, a circuit-closing member slidable within said opening and adapted to contact with a receptacle bottom when a disk is not placed therein by a downward movement of the plunger, means for resiliently mounting said circuit-closing member, an electric signal and electrical connections between said signal and the circuit-closing member.

3. In a machine of the class described, a plunger having a longitudinal central opening, a resiliently mounted rod movable therein, means connected to said rod for closing an electric circuit when said rod contacts with a receptacle and means for retaining said circuit closed until manually opened.

Signed at the city, county and State of New York this 16th day of December, 1919.

LOUIS A. FREEDMAN.