H. HOLLERITH.

APPARATUS FOR PERFORATING RECORD CARDS.

APPLICATION FILED FEB. 4, 1914.

1,110,261.

Patented Sept. 8, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

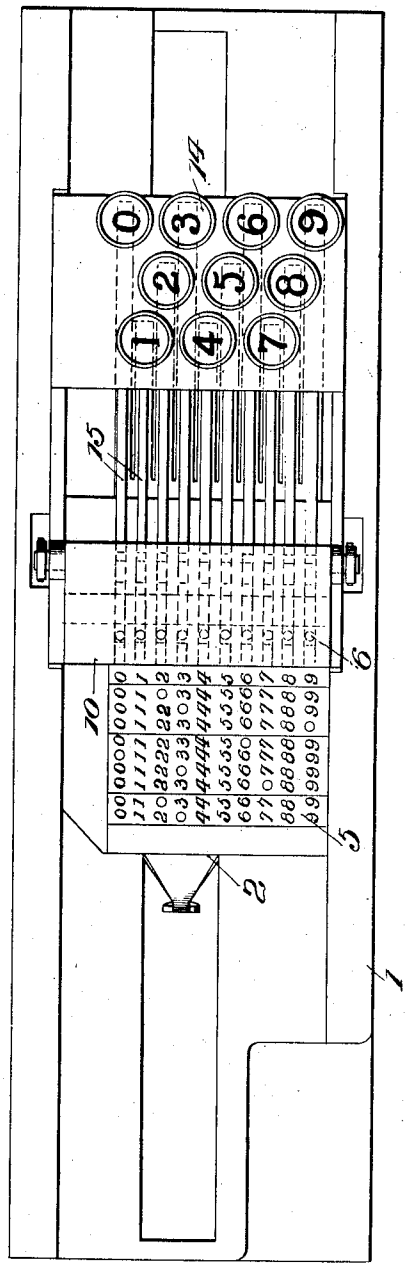
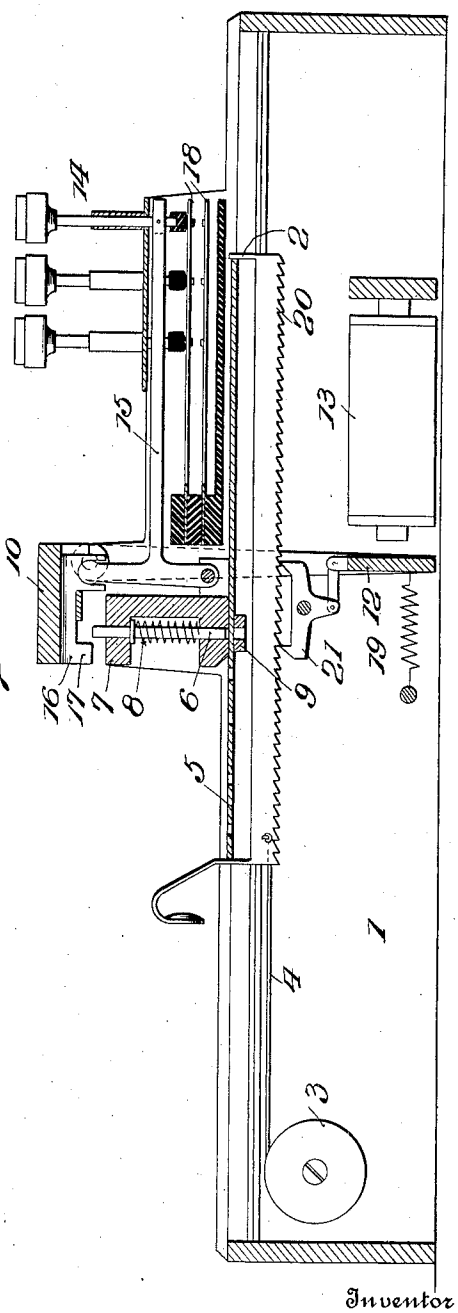


Fig. 2.



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2 SHEETS—SHEET 2.

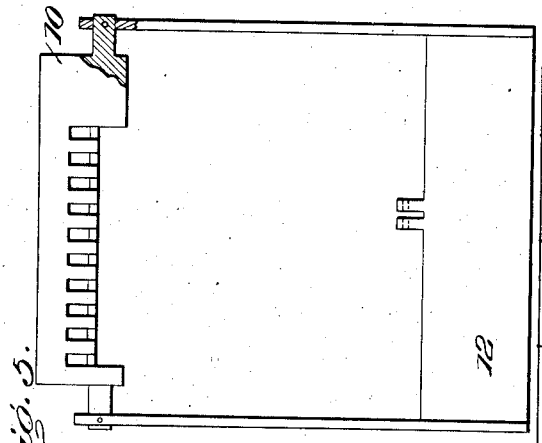


Fig. 5.

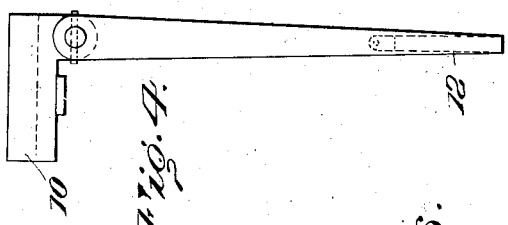


Fig. 4.

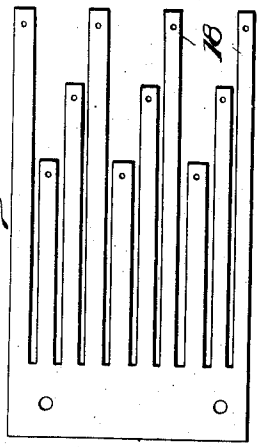


Fig. 3.

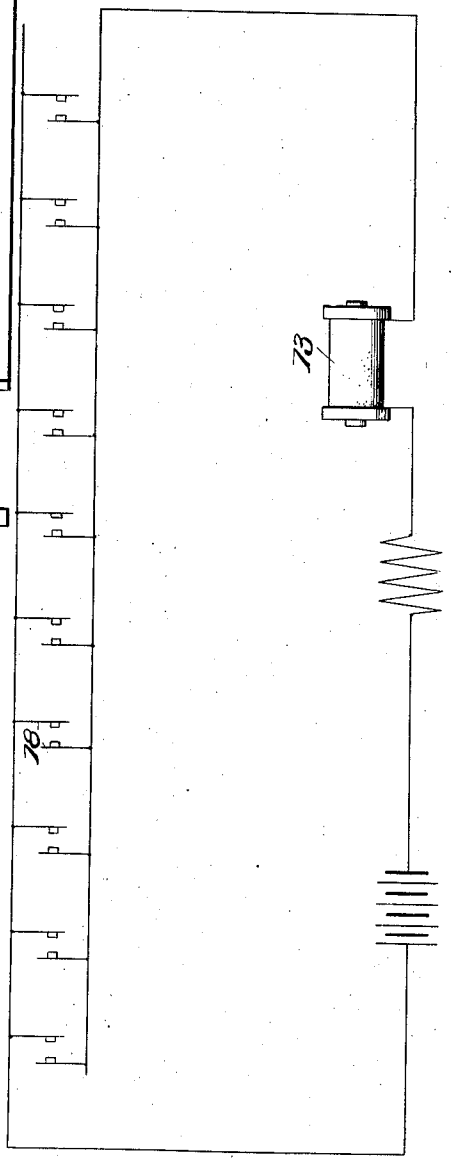


Fig. 6.

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UNITED STATES PATENT OFFICE.

HERMAN HOLLERITH, OF WASHINGTON, DISTRICT OF COLUMBIA.

APPARATUS FOR PERFORATING RECORD-CARDS.

1,110,261. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed February 4, 1914. Serial No. 816,533.

To all whom it may concern:

Be it known that I, HERMAN HOLLERITH, of Washington, District of Columbia, have invented certain new and useful Improvements in Apparatus for Perforating Record-Cards; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In Letters Patent No. 682,197, dated September 10, 1901, I showed and described an apparatus for perforating record-cards of the character used in the tabulation of statistics according to the Hollerith tabulating system, such cards being provided with figures or characters arranged in groups, each consisting of one or more vertical rows comprising a cipher and the nine digits. According to the apparatus shown in such patent a series of punches was directly controlled by a series of keys, one for each punch.

The primary object of my present invention is to lessen the energy required in the manipulation of the punches; and a further object is to simplify and cheapen the cost of construction.

In the accompanying drawings, Figure 1 is a plan view. Fig. 2 is a vertical longitudinal sectional view. Fig. 3 is a plan view of a series of contact members. Figs. 4 and 5 are views at right angles to each other showing the armature and punch-actuator. Fig. 6 is a diagrammatic view of the wiring.

Referring to the drawings, 1 designates a rectangular bed, and 2 a card-support which is movable longitudinally of the bed, step by step, under the influence of a motor 3 to which the card-support is connected by a cable 4. It is not necessary to describe in detail the feature of the card-support or means whereby it may quickly be moved from one end to the other of its travel independently of its controlling mechanism.

The card 5 is provided with figures or characters arranged in groups, each consisting of any desired number of vertical rows comprising the nine digits and a cipher so that digits of the same value will be in the same horizontal row. The punches 6 are arranged in a line which extends across the line of travel of the card. They are mounted in a housing 7 and are normally held retracted by suitable compression springs 8 which serve to return the punches to their normal positions. The punches move in line with openings formed in a lower fixed guide plate 9 above which the card passes.

10 designates a punch-actuator which is shown in the form of a rocking member journaled in uprights of the bed. According to my present invention the punch actuator is controlled by the armature 12 of a relay magnet 13 which is energized each time the punch-controlling keys 14 are operated. Each key engages the outer end of lever 15, and an upwardly extending arm of each lever engages with a block 16 slidable in grooves in the underside of the rocking member. When the latter is rocked it will have no effect on any punch except the particular punch whose block 16 has been moved so that the depending or thickened portion 17 thereof will be positioned directly between such punch and the punch actuator. Each key 14 controls two spring contacts 18 which are normally disengaged, but through which the circuit is closed when a key is depressed, thereby energizing magnet 13. When pressure is released from a key it is returned to its normal position by the recoil of the spring contact which was depressed thereby, and thus the respective lever and its block 16 are restored to their normal position. The armature 12 has two side arms which depend from and are secured to the journals of the punch-actuator. A spring 19 normally holds the armature away from its magnet.

I have shown the card-support as having a rack 20 depending therefrom and with which engages an escapement pawl 21 mounted on frame 1 and which is suitably connected to armature 12 so as to be rocked by the latter to allow a step by step advancement of the card-support.

As in the case of my before noted patent, the keys are arranged in three rows, each row being at a different distance from the punches. By means of my present invention very little effort is required in the manipulation of the apparatus, since it is only necessary to bring coöperating contacts together to effect the operation of the punches. As the circuit is closed through a pair of contacts the respective lever positions the slide over the punch to be operated, and as the armature swings toward the mag-

net the punch actuator causes the selected punch to make the necessary perforation in the card.

I claim as my invention:

1. In a record-perforating apparatus, the combination with a traveling card-support and controlling means therefor, of a plurality of punches arranged in a row, a punch-actuating member, a series of devices capable of being positioned between said member and said punches, a series of levers for controlling said devices, keys for manipulating said levers, an electric circuit, an electro-magnet in said circuit for controlling said member and said card-support controlling means, and circuit closing contacts controlled by said keys.

2. In a record-perforating apparatus, the combination with a traveling card-support and an escapement mechanism therefor, of a plurality of punches arranged in a row, a punch-actuating member, a series of devices capable of being positioned between said member and said punches, a series of levers for controlling said devices, keys for manipulating said levers, an electric circuit, an electro-magnet in said circuit for controlling said member and said escapement, and circuit closing contacts controlled by said keys.

3. In a record-perforating apparatus, the combination with a traveling card-support and an escapement mechanism therefor, of a plurality of punches arranged in a row, a punch-actuating member, a series of devices carried by said member and capable of being positioned between the latter and said punches, a series of keys for controlling said devices, an electric circuit, an electro-magnet in said circuit for controlling said member and said escapement, and circuit closing contacts controlled by said keys.

4. In a record-perforating apparatus, the combination with a traveling card-support and escapement mechanism therefor, of a plurality of punches arranged in a row, a rocking member, a series of slidable blocks carried by said rocking member and capable of being positioned to engage the punches, a series of levers engaging said blocks, keys for manipulating said levers, an electric circuit, an electro-magnet in said circuit having its armature connected to said rocking member, said escapement mechanism being controlled by said armature, and circuit closing contacts controlled by said keys.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

HERMAN HOLLERITH.

Witnesses:
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