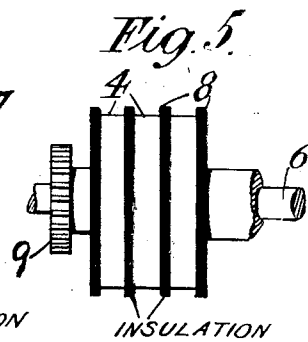
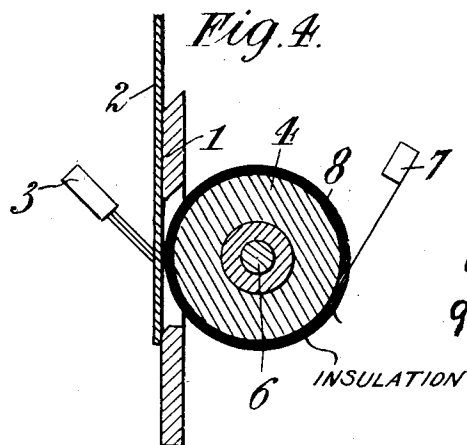
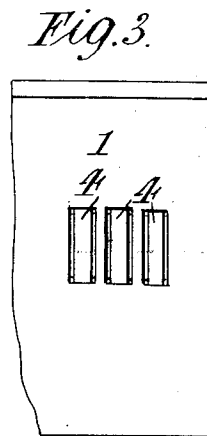
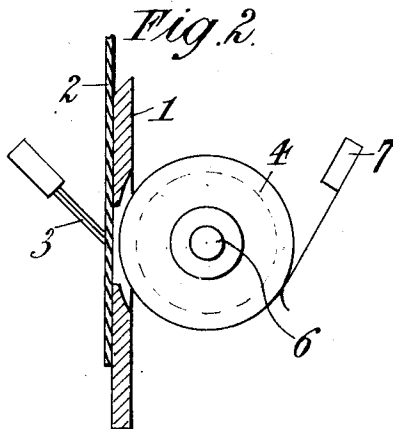
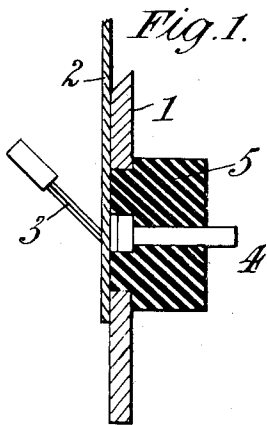


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ELECTRICALLY OPERATED TABULATING AND LIKE MACHINE.
APPLICATION FILED NOV. 15, 1915.

1,214,540.

Patented Feb. 6, 1917.



Witnesses

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CHRISTIAN AUGUSTINE EVERARD ALFRED GREENE, OF LONDON, ENGLAND.

ELECTRICALLY-OPERATED TABULATING AND LIKE MACHINE.

1,214,540.

Specification of Letters Patent.

Patented Feb. 6, 1917.

Application filed November 15, 1915. Serial No. 61,728.

To all whom it may concern:

Be it known that I, CHRISTIAN AUGUSTINE EVERARD ALFRED GREENE, a subject of the King of England, residing at London, England, have invented certain new and useful Improvements in Electrically-Operated Tabulating and like Machines, of which the following is a specification.

This invention relates to electrically-operated tabulating and other machines of the kind in which the values to be tabulated are indicated on cards or similar insulating septa by the vertical positions of holes punched in a number of columns on the cards. The cards are passed between a plate containing a row of contact-pieces insulated from the plate and a row of brushes, each of which is separated from its corresponding contact-piece by the card but can make contact therewith through a hole in the card. Whenever contact is made through a hole in the card between a brush and its corresponding contact-piece, a value, corresponding to the value indicated by the position of the hole on the card is set up on the tabulating machine by means which form no part of the present invention.

Difficulty has been sometimes experienced from the presence in the cards of conducting flaws, which complete the electrical circuit between the brush and the contact-piece without the two coming into contact through a hole in the card, a value being thereby set up in the machine which does not correspond to any hole punched in the card. The errors in the tabulated results produced in this way would impair the efficiency of the machine and it is the object of the present invention to prevent a conducting flaw in the card from completing the electrical circuit between brush and contact-piece.

According to this invention, a support is provided for the septum which holds the latter away from the face of the arresting contact, that is, the one against which the other or advancing contact is moved by its yielding-control (for example, the resilience of the arm or finger which carries or constitutes the contact) so that should the septum contain a metallic speck which would make metallic contact with the advancing contact, it cannot complete the circuit be-

tween this and the arresting contact because the speck, on the face of the card which is toward the arresting contact, will not be pressing against the latter.

The support to maintain the septum free of the arresting contact may take the form of a guard which is either independent of the arresting contact or carried thereby.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and the general arrangement of the brushes or contacts and the septum support, without departing from the spirit and scope of my invention as defined in the appended claims.

In the accompanying drawings:—Figure 1 is a sectional view of one form of the invention; Fig. 2 is a sectional view of another form of the invention; Fig. 3 is a front elevation of the same, but with the card and front brushes omitted; Fig. 4 is a sectional view of another form of the invention, and Fig. 5 is a front elevation of the contact-disks of the same.

Referring to Fig. 1, 1 is the plate, and a card passing between it and brushes or contacts 3, which are located opposite to contact-pieces 4 held in blocks of insulating material 5 and fixed contacts 3 are arranged to move relative to the contact 4. These parts, excepting the contact-pieces, are similar to those in the machines as constructed heretofore, in which the faces of the contact-pieces are flush with the surface of the plate 1. According to the present invention, the faces of the contact-pieces 4 are set back slightly relatively to the face of the plate 1, so that the face of the plate 1 and of the insulating blocks 5 act as a guard to prevent the card from touching the contact-pieces. If then a conducting flaw in the card comes under a brush, there is no contact between the conducting flaw and the contact-pieces and the tabulating mechanism is not actuated.

This device is quite successful in avoiding errors due to conducting flaws, but a modified construction is preferred as sometimes the machine is used for long periods with-

out cleaning. Under these circumstances the faces of the contact-pieces, not being rubbed by the passage of the cards against them, may become dirty or covered with fibers from the card, so that eventually the brush does not make electrical contact when coming against the faces through a hole in the card. The devices shown in Figs. 2 to 5 overcome this difficulty without losing the advantage of having the face of the contact-piece out of contact with the card.

Referring to Figs. 2 and 3, the plate 1 is given the form of a grid as shown, and the contact-pieces, constituting the relatively fixed contacts, take the form of disks 4, mounted on but insulated from a shaft 6. The disks pass partially through the spaces in the grid plate 1, so that the edges of the disks just fail to touch the cards 2. The solid portions of the grid then support the card and prevent its touching the disks. The shaft 6, with the disks on it, is rotated at any convenient speed, and the current transmitted to the disks from the brushes or contacts 3, constituting the relatively movable contacts, through holes in the cards, is collected by brushes 7 rubbing against the edges of the disks. This rubbing action keeps the edges of the disks clean.

An alternative form of this device is shown in Figs. 4 and 5, in which the plate 1, instead of being in the form of a grid, has a horizontal slot opposite to the movable contacts or brushes 3. The relatively fixed contacts or contact-pieces 4 are, as before, disks mounted on a shaft 6, but they are separated one from the other by disks of insulating material 8, the edges of which protrude beyond the edges of the disks so as to provide support for the cards against the pressure of the brushes 3.

Any means may be employed for rotating the relatively fixed contacts whose contacting surfaces are circular, such as those shown in Figs. 2 to 5, and a spur-wheel 9 is shown on the shaft 6, Fig. 5, for this purpose.

It will be understood that the movable contacts may be yieldingly controlled by any means, such for example as the spring of the material itself of which the brushes 3 are composed. The brushes would thus be sprung back by the septum 2 when no hole is opposite the brush, but when a hole is brought opposite the brush, the latter would spring forward and come against the relatively fixed contact 4.

I employ the word "card" to include continuous bands of paper or septa of any suitable form, and, when the electrical circuits of the machine are such that all the brushes 3 are electrically connected together, the septa need not be of insulating material.

The advantages of my invention result

from the provision of means for holding the septum out of engagement with one of the contacts, so that the electric circuit from contact to contact will not be closed by means of conducting material which may be contained within the septum.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A device of the character described, comprising a plurality of contacts, one of said contacts being movable relative to the other, and a septum support arranged to hold said septum out of engagement with one of the contacts; substantially as described.

2. A device of the character described, comprising a plurality of contacts arranged to be connected in an electric circuit, one of said contacts being movable relative to the other, said contacts being arranged to permit a septum to be passed between them, and a support for the septum and arranged to hold said septum out of engagement with the relatively fixed contact to prevent the closing of the electric circuit through the contacts by means of conducting material in the septum; substantially as described.

3. A device of the character described, comprising two sets of contacts, the contacts of one set being movable relative to the contacts of the other set, said sets of contacts being arranged to permit the passage of a septum between them, and supporting means for holding the septum out of engagement with one set of contacts during the passage thereof between the contacts; substantially as described.

4. A device of the character described, comprising a plurality of rotating contacts, a plurality of contacts arranged to move toward and from the rotary contacts, said contacts being arranged to permit the passage of a septum between the rotary contacts and the relatively movable contacts, means for retaining the septum out of engagement with the rotary contacts, and a brush in engagement with each of said rotary contacts; substantially as described.

5. A device of the character described, comprising a plurality of rotating contacts, a plurality of contacts arranged to move toward and from the rotary contacts, said contacts being arranged to permit the passage of a septum between the rotary contacts and the relatively movable contacts, means for retaining the septum out of engagement with the rotary contacts, means for rotating the rotary contacts, and a brush in engagement with each of said rotary contacts; substantially as described.

6. A device of the character described, comprising a plurality of rotating contacts, a plurality of relatively movable contacts arranged to engage the rotary contacts at

predetermined intervals, said rotary contacts and relatively movable contacts being arranged to permit the passage of a septum between them, disks of insulating material
5 between the rotating contacts, said disks being of greater diameter than the contacts to prevent the septum from engaging the ro-

tary contacts, and means for rotating the rotary contacts; substantially as described.

In testimony whereof I have signed my name to this specification. 10

CHRISTIAN AUGUSTINE

EVERARD ALFRED GREENE.