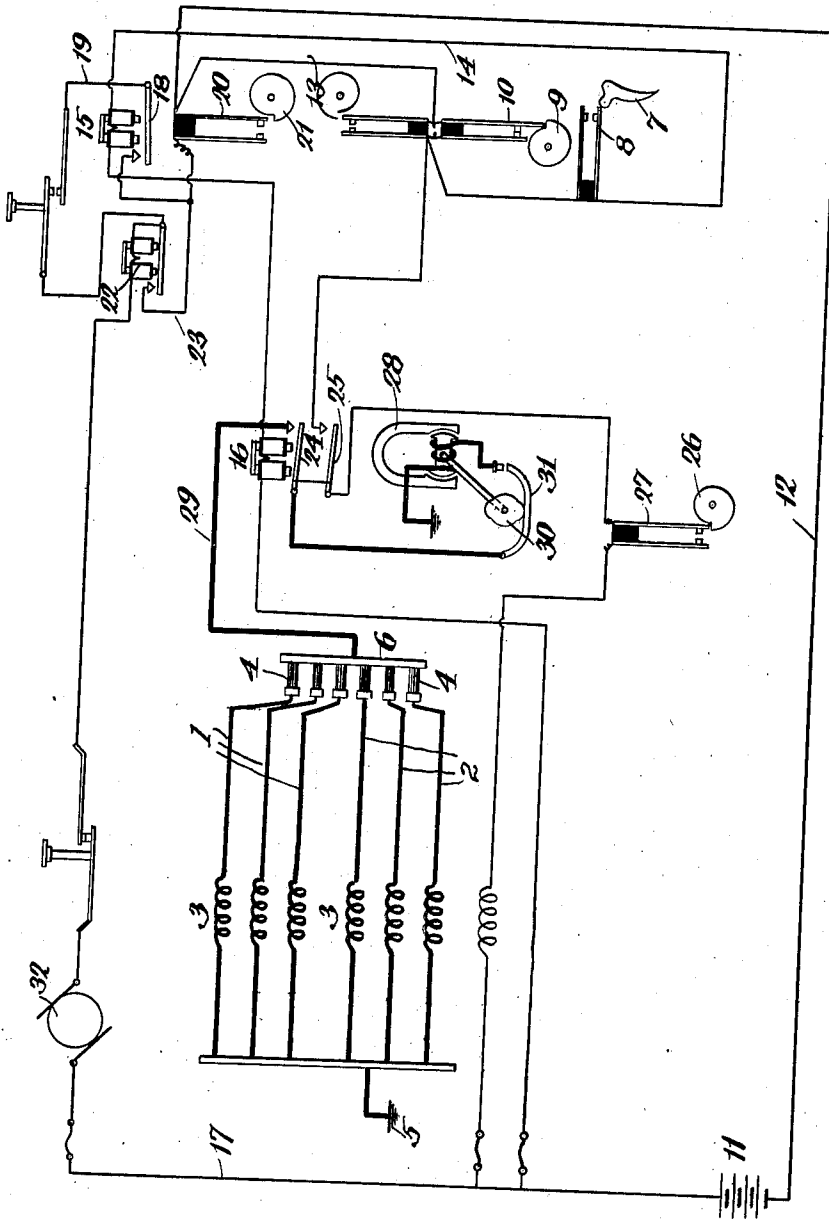


J. W. BRYCE,
 TABULATING MACHINE.
 APPLICATION FILED MAY 15, 1919.

1,335,274.

Patented Mar. 30, 1920.



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JAMES W. BRYCE, OF BINGHAMTON, NEW YORK, ASSIGNOR TO INTERNATIONAL TIME RECORDING COMPANY OF NEW YORK, A CORPORATION OF NEW YORK.

TABULATING-MACHINE.

1,335,274.

Specification of Letters Patent.

Patented Mar. 30, 1920.

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To all whom it may concern:

Be it known that I, JAMES W. BRYCE, a citizen of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented certain new and useful Improvements in Tabulating-Machines, of which the following is a full, clear, and exact description.

My present invention is an improvement in tabulating or sorting machines or devices of similar character and has as its primary objects to provide for the operation of such machines by either an alternating or a direct current. This is an important consideration as these machines require for their operation a motor, and it may happen that the only available source of current for running it is alternating, so that either a specially constructed direct current motor or a regular alternating motor which will not work in a direct current system is required.

A further object is to dispense with all controlling relays in such circuits as are known as the counter circuits in a tabulating machine, as well as the resistance units in series therewith, fuses and more or less complicated wiring, or if the machine be of the relayless type, to dispense with the contacts in series with the counter magnets.

In carrying out the invention, I use any suitable form of tabulating or sorting machine, and for purpose of illustration I have selected for the drawing which is hereto annexed a diagram largely copied from one used in an application of Clair D. Lake, filed Aug. 16, 1918, Serial No. 250,104, which shows the arrangement of circuits and mechanism used in a now well known form of tabulating machine of the relayless type, adding to it a diagrammatic showing of the parts which comprise my improvements, and in order that the general nature of such machine may be understood I now refer to this drawing.

The machine illustrated is assumed to comprise two counters, one containing a plurality of counter magnet circuits 1, and the other a similar number of counter magnet circuits 2, each containing a magnet 3, and a brush 4. In the present case these circuits are grounded at 5. The brushes 4 bear upon a contact plate or block 6, or they may be carried by this plate and bear on individual contacts, and in the use of the ma-

chine perforated cards are passed between the brushes and said plate 6 or the contacts, with the result that whenever a brush comes over a perforation in a card it touches the contact and directs a current through the counter magnet connected with that brush.

When a card is passed by the action of the machine into the card chute, it is supposed to engage with a pivoted lever 7, and by turning that lever it closes two contacts 8 and keeps them closed as long as the card remains in the chute. At the same time or an instant thereafter a cam 9 operated by the machine closes two contacts 10, and this operates to connect one side of a source of current 11, here shown conventionally as a battery, but which may be any source of either direct or alternating current, through wire 12 to a wire 13, from which a path for the current extends through the closed contacts 10, and the closed contacts 8 to a wire 14, to the motor control relay 15, and the counter control relay 16, and thence to the other side 17 of the source of supply circuit.

The energization of relay 15 attracts its armature 18 and closes a branch circuit 19 from a pair of normally closed contacts 20, operated by a cam 21, whereby the current from wire 12 is directed through a relay 22 which draws up its armature and closes another branch 23, from the contacts 20 through the relay 22, so that the motor circuit remains closed until it is broken by the operation of the cam 21.

The energization of the relay 16 raises two armatures 24 and 25, the latter of which closes a circuit through the contacts 8 and thus keeps the counter and the motor control relays active until this circuit is interrupted by the cam 26, acting on two contacts 27.

There are other parts illustrated but the system is well known in the art and such parts, as well as some of those above described, are not essential to and need not all be used in carrying out my improvement.

Arranged at any convenient point in the machine is any suitable form of low tension type magneto machine 28, having preferably an H form of armature. This magneto is driven by the machine and is so connected therewith that it develops its highest voltage at the moments when the perforations in a card, if any there be, reach the line of the

brushes 4, so that it sends a single impulse through any perforation that may come under a brush. One pole of the magneto is directly grounded and the current impulses, when they pass will be through the circuit 29, closed by the relay 16, and armature 24, the brush that contacts with the plate 6, through the corresponding counter magnet to the ground 5.

Underwriter's regulations may require a circuit breaker between the magneto and the plate 6. If so, the magneto shaft may carry a cam 30, that raises and lowers an arm. 31, in the circuit 29, and this cam may be so timed as to allow only the top of a current wave or impulse to pass to the counter magnets. In any event there will be no appreciable sparking, as the breaks, should they occur, will be at a low point in the wave.

If the operating current be continuous, a compound or shunt wound motor 32 may be used. If alternating, any self-starting or induction motor may be substituted. The change from continuous to alternating current will also involve well understood changes in the relays which will have to be properly wound, and preferably so as to operate on either direct or alternating current, and other well understood conditions will have to be observed.

It is manifest that by the above described improvements the construction and operation of a machine of this character are very greatly improved and simplified. Experience has demonstrated that a small magneto of the kind described and operated under the conditions which ordinarily obtain in these machines is amply sufficient to operate one or several counter magnets simultaneously or in rapid succession.

What I claim is:

1. In a machine of the kind described, the combination with counter or similar magnets and means including brushes for connecting them in circuit by and through perforated cards, of a magneto machine driven at a given rate with relation to the movement of the cards so as to develop a current impulse at the moment when perforations in a card pass the line of said brushes.
2. In a machine of the kind described, the combination with counter or similar magnets and means including brushes for connecting them in circuit by and through perforated cards, of a magneto machine connected with and driven by the machine at a rate which causes it to develop an impulse of current at times when the perforations in a card pass the line of brushes.
3. In a machine of the kind described, the combination with a line of brushes and contacts therefor and between which perforated cards are to be passed, of a magneto machine in a circuit completed through the brushes and contacts and driven at a rate which causes it to develop an impulse of current in said circuit at the moments when perforations in the cards pass the line of brushes.
4. The combination with a tabulating machine having a plurality of counter magnets, any suitable source of current for controlling and operating said machine, and a magneto driven by the machine at a given rate so as to develop current impulses at predetermined instants for the operation of the counter magnets.

In testimony whereof I hereunto affix my signature.

JAMES W. BRYCE.