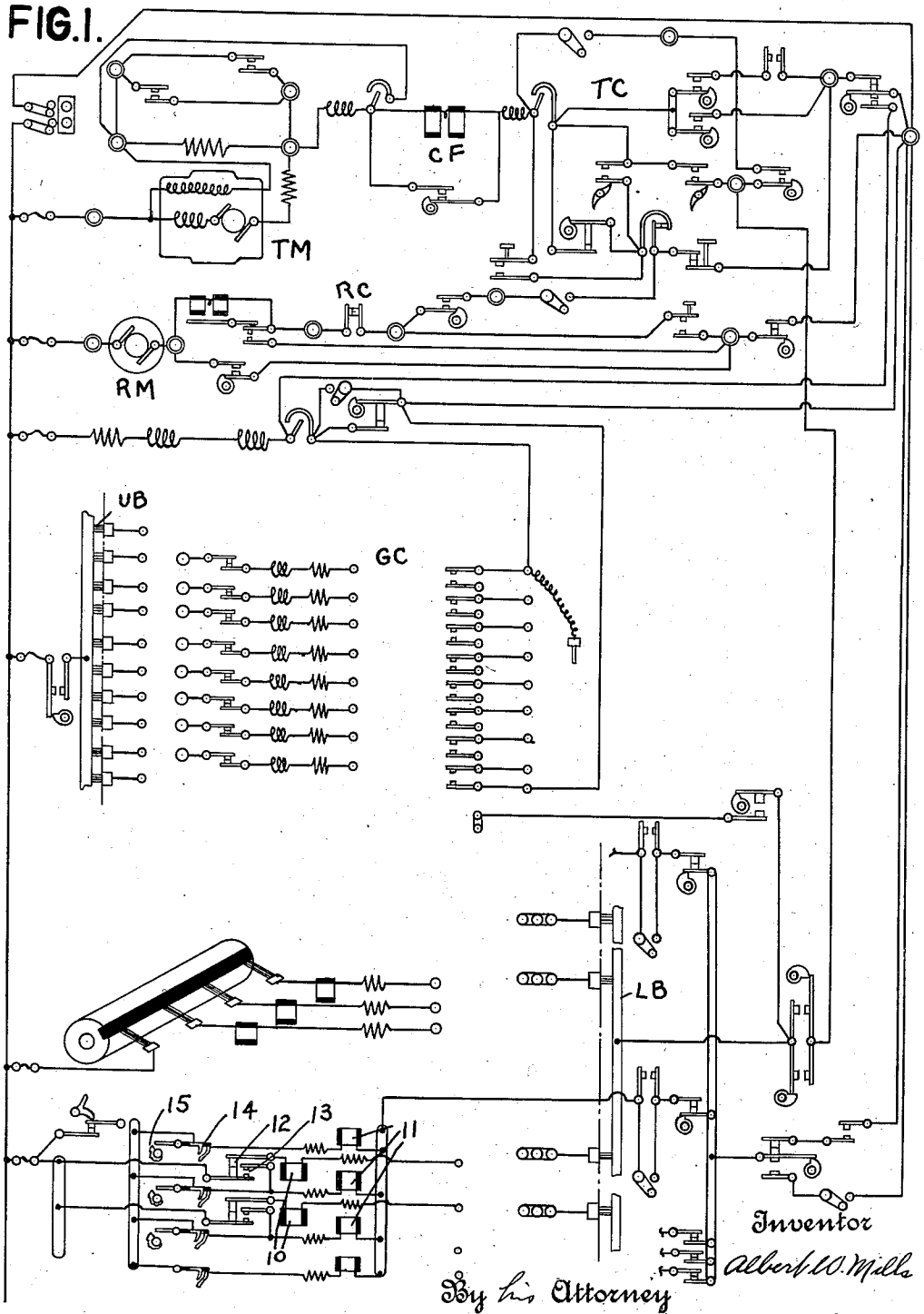
May 6, 1930. A. W. MILLS 1,757,133

PRINTING MECHANISM

Filed Aug. 16, 1928 2 Sheets-Sheet 1

FIG. 1.



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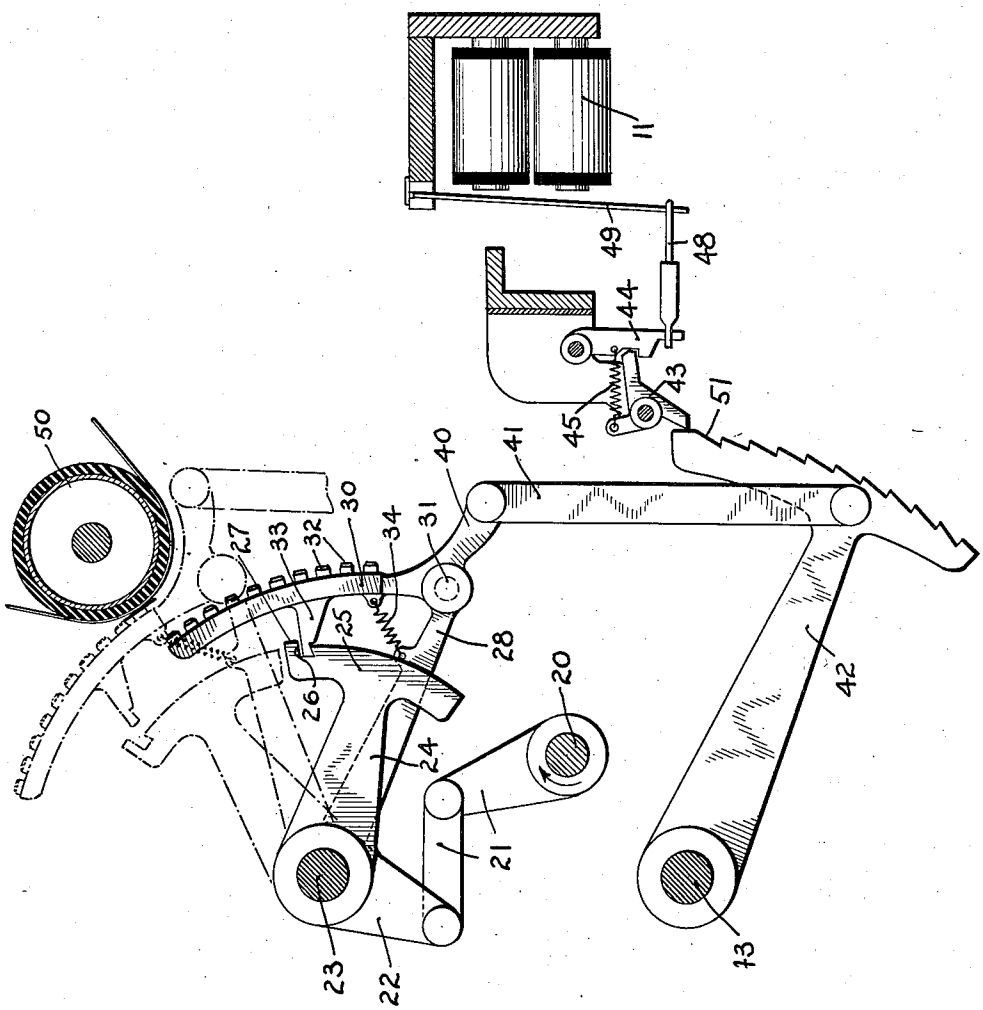


FIG. 2.

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UNITED STATES PATENT OFFICE

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PRINTING MECHANISM

Application filed August 16, 1928. Serial No. 299,942.

The invention relates to accounting machines and has for its principal object the provision of an improved printing mechanism for such machines.

Another object of the invention resides in the simplification of the printing mechanism of such machines by the provision of common operating mechanism for selectively positioning the type and for supplying the power stroke for effecting printing from the selected type.

Other objects reside in new and improved structures and cooperations of the several elements of the mechanism as will be pointed out in the following detailed description.

The preferred form of the invention contemplates a type carrier having a plurality of type and movable to bring the several type successively opposite a platen. A driving member, constantly operating, is provided with a camming surface which drives the type carrier as long as the motion of the latter is unimpeded but serves to cam the type carrier out of driving association and incidentally force the selected type against the platen when the motion of the type carrier is interrupted. The motion of the type carrier may be interrupted by numerous means well known in the art such as key operated stops or ratchet and pawl arrangements.

The invention is illustrated by way of example in the accompanying drawings in which:

Fig. 1 shows a circuit diagram of a tabulating machine to which the printing device may be applied and

Fig. 2 shows the mechanical structure of the printing mechanism.

The circuit diagram in Fig. 1 is substantially that of the printing tabulator disclosed in the copending application of Daly and Page, Serial No. 6,980, filed February 5, 1925. During adding operations the machine is driven by a tabulating motor TM which is controlled by a group of circuits including relays and cam contacts and indicated generally at TC. The usual card feed clutch magnet is shown at CF in series with the tabulating motor and is effective to feed the usual perforated cards as long as the tabulating motor is in operation. The cards feed successively past the upper analyzing brushes UB and the lower analyzing brushes LB and as they pass the latter the items represented by their perforations may be entered into accumulators represented by counter magnets 10 and printed by printer magnets 11. The cards continue to feed and the successive items to be entered as long as certain classification perforations on successive cards do not change, this being taken care of by the usual group control system indicated generally at GC. On a change in the group classification perforations, the group control system interrupts accumulating and a total taking operation may be initiated, the machine in this instance being driven by the reset motor RM under control of a group of circuits indicated generally at RC. The printing in this case also is controlled by the printing magnets 11. These operations are well understood and fully explained in the copending application referred to above.

Each card column contains ten index point positions differentially located to represent the ten digits and a different digit is represented by a perforation in each position. As the card passes the lower brushes LB the position of its index points determines the time of closure of circuits through the analyzing brushes and the resulting current impulses may energize selected counter magnets 10 when the latter are properly plugged to the lower analyzing brushes. The magnets 10 when thus momentarily energized effect clutching action between an accumulating wheel and a constantly operating driving shaft which clutching action persists until a predetermined point in the machine cycle. The amounts represented by the perforations are thus rolled into the accumulators.

The magnets 10 when energized open contacts 12 to break their own circuits and close contacts 13 to energize print magnets 11 at a time in the cycle corresponding to the value of the item entered in the accumulators. Total printing is controlled by contacts 14 which cooperate with stepped cams 15. The latter are positioned by the accumulator wheels and the steps are so arranged that

when the contacts 14 are operated during total taking they will be closed at a time in the cycle corresponding to the items standing on the accumulators, and energize print magnets 11 at this time.

The usual rock shaft for operating the type carriers is shown at 20, it being understood that this shaft rocks clockwise during listing and totaling operations to position the type carriers and then counterclockwise to restore the type carriers in the usual manner. The shaft 20 through linkage 21 connected to an arm 22 fast on shaft 23 oscillates the latter. Fixed to the shaft 23 to oscillate therewith are a number of driving elements 24 one for each of the type carriers, only one of which is shown in the drawing. Each element 24 is provided with a sector portion 25 at its outer end which has a notch 26 therein whose upper edge is formed by an extension 27.

An arm 28 for each type carrier is freely mounted on shaft 23 and is pivoted to the type carrier 30 at 31. The type carrier has the usual printing type 32 and an extension 33 which is urged against the surface of driving member 24 by a spring 34. When the type carrier and driving member are in proper relative positions the end of extension 33 engages notch 26. The type carrier 30 has an extension 40 to which is pivoted one end of a link 41 whose other end is pivoted to a ratchet member 42 mounted for oscillation about a shaft 43. The ratchet member has a tooth for each type on the type carrier and a pawl 43 cooperates with the teeth but is normally held out of their path by a latch 44. A common spring 45 urges pawl 43 into the path of the ratchet teeth and urges latch 44 into latching position. The latch 44 may be released through a call rod 48 operated by the armature 49 of printing magnet 11. When the magnet 11 is energized to attract its armature call rod 48 is moved to the right releasing latch 44 and allowing pawl 43 to engage the ratchet tooth which happens to be presented to it on member 42.

During printing operations, when the shaft 23 and driving element 24 oscillate the type carrier 30, by virtue of the engagement of extension 33 in notch 26, oscillates with them and brings the several type 32 opposite platen 50 successive as the index point positions of the cards are encountered by the analyzing brushes during listing and as the total contacts 14 pass their several closing positions during totaling. In either case the printing magnet 11 is energized at a time in the cycle representing the character to be printed. The energization of this magnet, through call rod 48, releases latch 44 and permits pawl 43 to engage one of the ratchet teeth on member 42 thereby interrupting the motion of type carrier 30.

The driving element 24 continues its motion and the lower edge of notch 26 cams extension 33 quickly out of the notch and throws the selected type against the printing platen to effect printing as indicated by the dot dash lines. On the return movement of the driving member 24 the extension 27 thereon engages extension 33 on the type carrier and returns the latter to home position, the spring 34 meanwhile causing the end of extension 33 to seat itself in the notch 26. As the member 42 reaches home position a cam surface 51 thereon cams the pawl 43 into latching position allowing it to be relatched by latch 44.

The invention has now been explained in connection with an operative embodiment but it will be understood that many changes in the arrangement, form and cooperation of parts will readily occur to those skilled in the art. The invention is therefore intended to be limited only as indicated by the scope of the following claims.

I claim:

1. A printing mechanism comprising a type carrier having a plurality of type thereon and a driving element, means for releasably attaching the carrier to the driving element and means for interrupting the movement of the type carrier to effect release of the releasable attaching means for projecting one of the several type for printing.

2. A printing mechanism comprising a type carrier having a plurality of type thereon and a driving element, means for releasably attaching the carrier to the driving element and means for interrupting the movement of the type carrier to effect release of the releasable attaching means for selecting the several type for printing, said releasable attaching means including means for causing printing by the selected type when the driving relationship is interrupted.

3. A printing mechanism comprising a type carrier, an extension on the type carrier and a driving element having a surface coacting with said extension for driving the carrier and means for interrupting the movement of the type carrier to cause the coacting extension and surface to effect relative displacement of the carrier and driving element.

4. A printing mechanism comprising a type carrier having type thereon, an extension on the type carrier and a driving element having a cam surface coacting with said extension for driving the carrier and means for interrupting the movement of the type carrier to cause said cam surface to cam the carrier away from the driving element to effect printing by the type.

5. A printing mechanism comprising a type carrier having a plurality of type thereon, cyclically operable driving element, means for releasably attaching the carrier to the driving element, means for interrupting the movement of the type carrier to effect release of the releasable attaching means for

projecting the type carrier for printing and means for restoring the type carrier to home position on each cycle of operation of driving element.

6. A printing mechanism comprising a type carrier having a plurality of type thereon, a cyclically operable driving element, means for releasably attaching the carrier to the driving element, means for interrupting the movement of the type carrier in different positions to effect release of the releasable attaching means for projecting the different type for printing, a projection on the type carrier and a projection on the driving element coacting with that on the carrier for restoring the latter to home position on each cycle of operation of the driving element.

7. A printing mechanism comprising a driving element having a depression therein, a type carrier having an extending tooth and means for resiliently holding the same in said depression, and means for interrupting the movement of the type carrier to cause the cooperation of the tooth and depression to cam the carrier into printing operation.

8. A printing mechanism comprising a reciprocating driving element having a depression therein, a type carrier having an extending tooth and means for resiliently holding the same in said depression to impart the reciprocatory motion of the driving element to the type carrier, means for interrupting the movement of the type carrier to cause the depression and tooth to cam the carrier into printing operation.

9. A printing mechanism comprising a reciprocating driving element having a depression therein, a type carrier having an extending tooth and means for resiliently holding the same in said depression to impart the motion of the driving element to said type carrier in one direction, means for interrupting the movement of the type carrier to cause the depression and tooth to cam the carrier into printing operation and an extension on said driving element coacting with said tooth to restore the carrier to home position.

In testimony whereof I hereto affix my signature.

ALBERT W. MILLS.