

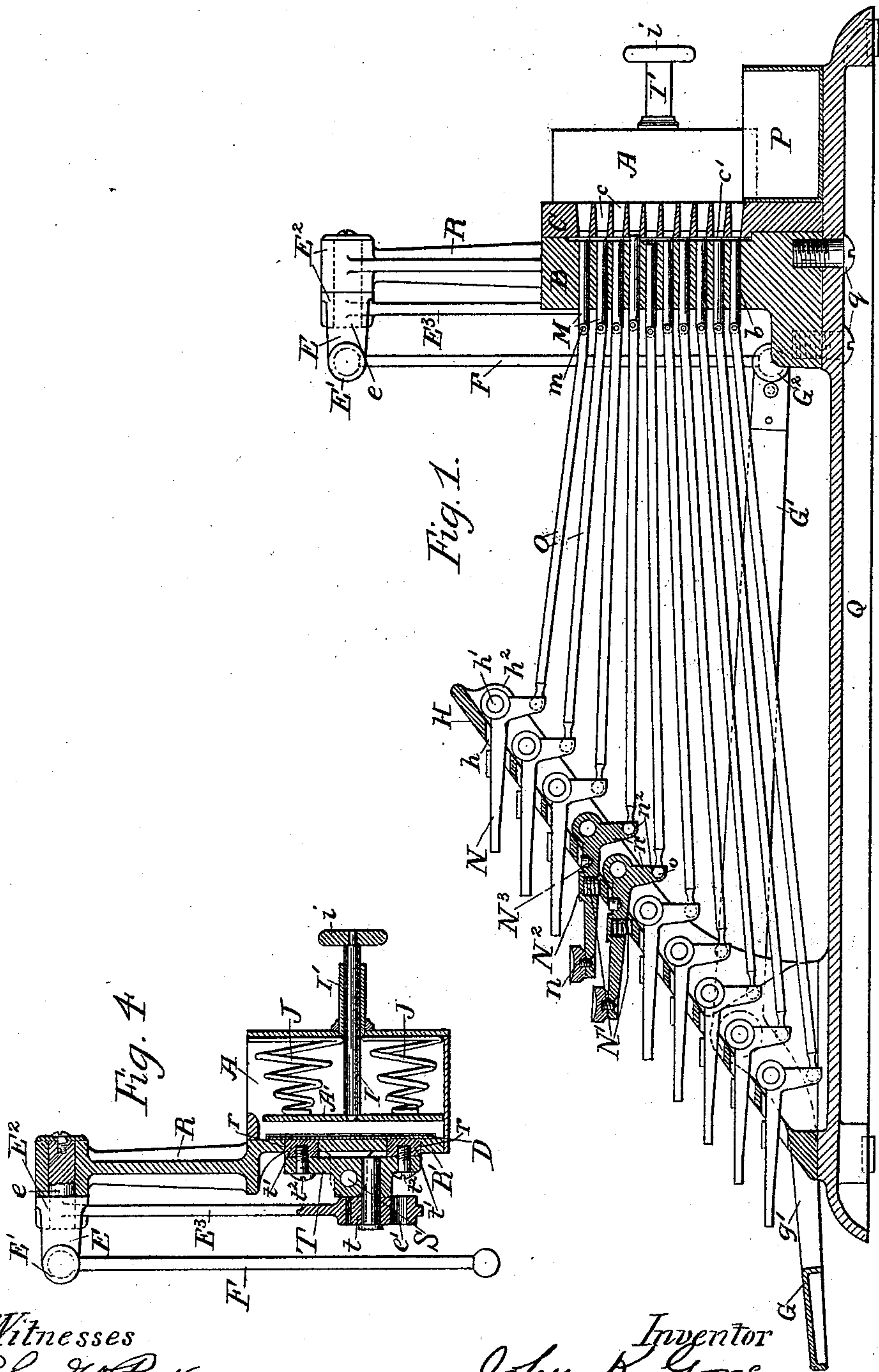
(No Model.)

3 Sheets—Sheet 1.

J. K. GORE.  
PERFORATING MACHINE.

No. 516,199.

Patented Mar. 13, 1894.



Witnesses  
Chas. W. Parker  
J. S. Parker.

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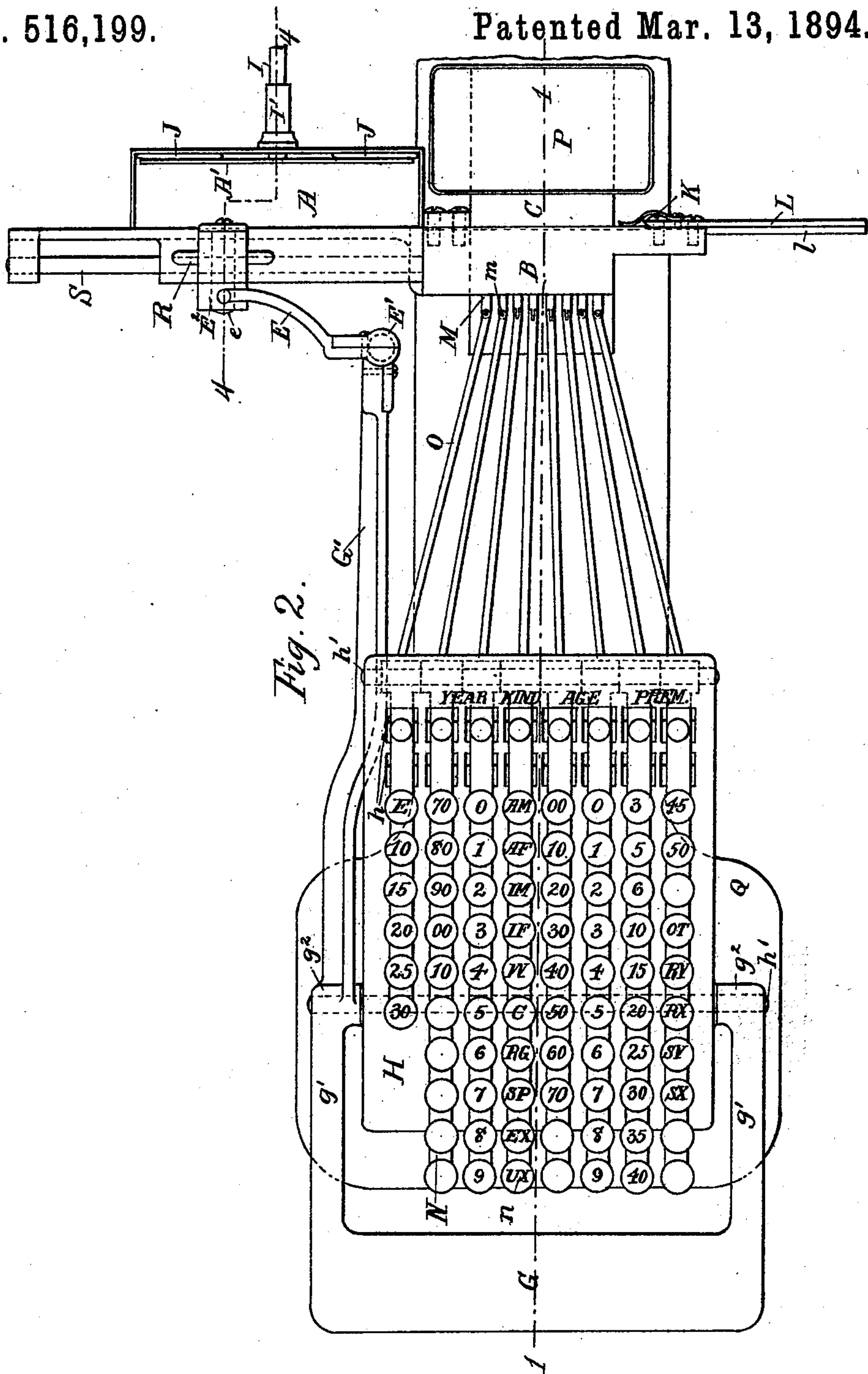
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**3 Sheets—Sheet 2.**

**J. K. GORE.**  
**PERFORATING MACHINE.**

**No. 516,199.**

Patented Mar. 13, 1894.



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(No Model.)

3 Sheets—Sheet 3.

J. K. GORE.  
PERFORATING MACHINE.

No. 516,199.

Patented Mar. 13, 1894.

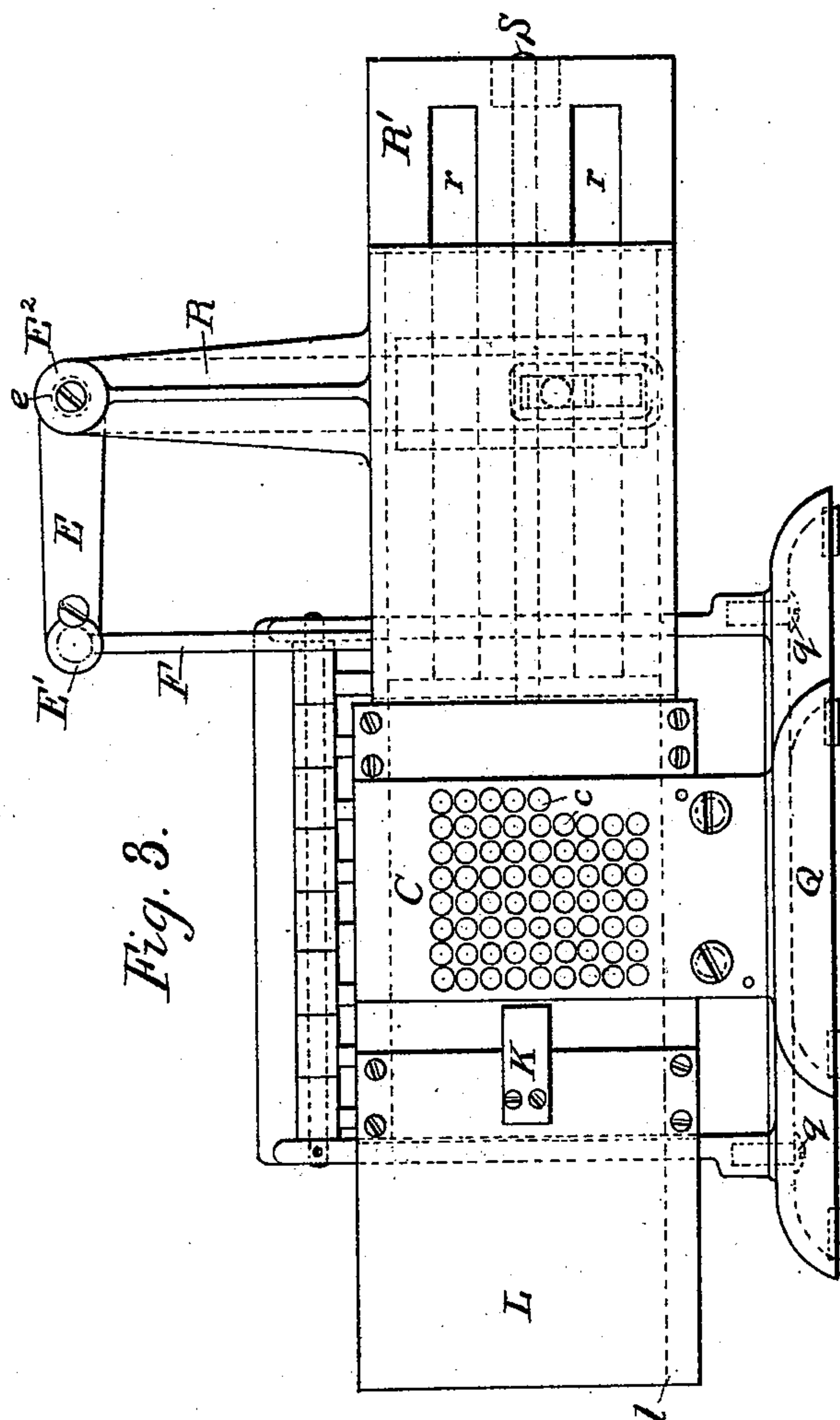


Fig. 3.

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# UNITED STATES PATENT OFFICE.

JOHN K. GORE, OF NEWARK, NEW JERSEY.

## PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 516,199, dated March 13, 1894.

Application filed February 8, 1893. Serial No. 461,453. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN K. GORE, a citizen of the United States, residing at Newark, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Perforating-Machines; and I do 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.

My invention has for its object to materially increase the facility and rapidity with which cards or other papers or substances may be perforated, especially such cards as are used for actuarial purposes, in the computation of life insurance matters, compilation of tables, &c.

My invention relates to that class of machines in which the punches are operated from a keyboard, and comprises an automatic feed for delivering the cards to be punched in proper position in front of the punches with the minimum effort of and without practical loss of time by the operator.

With such ends in view my improvement consists in the novel parts and combinations thereof hereinafter set forth.

In order to make the invention more clearly understood I have shown in the accompanying drawings means for carrying the same into practical effect, without, however, limiting the improvement in its useful applications to the particular construction which, for the sake of illustration, I have delineated.

In said drawings—Figure 1 is a vertical longitudinal sectional view on line 1—1 Fig. 2, of a perforating machine embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a rear view. Fig. 4 is a vertical sectional view on line 4—4 of Fig. 3.

"Q" indicates a plate or frame of suitable material, for instance cast iron, provided at its front with a keyboard "H" preferably inclined as best seen in Fig. 1. This keyboard is provided with perforations  $h$  through which extend forwardly the arms of angle levers "N." These levers are pivoted upon horizontal transverse axle or hinge pins  $h'$  which pass through bearing eyes in said levers and through correspondingly perforated vertical flanges  $h^2$  on the under side of the key board. The levers N constitute key levers and are

provided at their outer or front ends with indicating disks  $n$  as best seen in Figs. 1 and 2. The levers also have substantially vertical arms  $n'$  which extend downward and are provided at their lower ends with sockets  $n^2$  in which fit the spherical ends  $o$  of the punch rods O. The punch rods are of the various lengths required by the different positions of the several keys and extend rearwardly to the horizontally reciprocating punches M to which they are suitably pivoted by pins  $m$ . The punches are mounted and adapted to reciprocate in horizontal bearings  $b$  formed in the punch block B, the latter being mounted upon the face plate Q to which it is firmly secured by screws  $q$ . At the rear of the punch block is secured the die C having longitudinal perforations  $c$  opposite the respective punches M and into and through which the circular punched out portions of the card or paper are delivered, and whence they fall into a suitable receptacle P. Between the die and the punch block is formed a space  $c'$  of sufficient size and thickness to accommodate the card to be operated upon. This space is preferably formed by casting or planing out a recess in the rear of the punch block as shown in Fig. 1, or by placing between the die and punch block a piece of sheet metal of thickness adapted to the thickness of the card.

It will be observed from the description thus far given that if any key lever be depressed, the corresponding punch bar or rod will be forced longitudinally backward causing its punch to slide backward in the punch block, perforate any card which is in position in the space  $c'$  and pass through the card into the corresponding perforation  $c$ . The construction of the machine, furthermore, is such that several keys may be struck or depressed at once, thereby much facilitating and hastening the work of perforating. The arrangement of the punches for the actuarial work for which this machine is primarily designed is preferably as shown in Fig. 3, in which will be seen in horizontal rows and vertical columns the rear ends of the punches. The levers and punches are returned to their proper position by springs applied at any convenient or suitable point, for instance, in the construction illustrated such springs are shown at  $N'$  fitted in sockets  $N^2$  in the key



levers and bearing upon the key board (Fig. 1). The key levers are also preferably provided with rubber buffers  $N^3$  which are adapted to limit the return movement of the keys and punches under the force of the springs  $N'$ , and also to lessen the noise in operating the machine.

I will now proceed to describe the feed mechanism by which a card to be punched is by a single simple and quick movement of the operator brought into proper position behind the punches and in the space  $c'$ .  $G$  is a finger bar extending across the front of the key board and connected by arms  $g'$  with pivot bearings  $g^2$ . The latter are supported upon the extremities of one of the pins  $h'$ , which may be made longer than the others for this purpose. One of the arms  $g'$  is extended rearwardly beyond its bearing in the form of a lever arm  $G'$ , which is provided at its rear end with a universal joint bearing  $G^2$  in which is mounted the lower end of an upright link  $F$ . The latter at its upper end fits in a similar universal bearing  $E'$  mounted upon the end of a horizontal lever arm  $E$ , which arm is furnished with a horizontal hinge bearing  $E^2$  and with a depending or vertical arm  $E^3$ , the whole forming an angle lever as seen in Fig. 3. The bearing  $E^2$  is mounted upon a horizontal longitudinal axis or stud  $e$  carried by a vertical bracket arm  $R$ . The latter forms a part of a frame  $R'$  which is firmly secured to the punch block  $B$  or other suitable support.  $S$  is a horizontal transverse rod mounted on the frame  $R'$  and carrying a sliding cross head  $T$  to which latter is connected the vertical lever arm  $E^3$  by means of an anti-friction roller  $t$  mounted on the cross head and fitting in a vertical slot  $e'$  in the said arm. The frame  $R'$  is provided with horizontal transverse slots  $r$  in which fit blocks  $t'$  which are secured by screws  $t^2$  to the said sliding cross head. On the rear side of the frame  $R'$  is the card carrier  $D$  formed of a thin rod or bar of metal about the thickness of the cards to be used, which carrier is secured to the rear faces of the blocks  $t'$ . It will be evident from the foregoing description that when the finger board or lever  $G$  is depressed the card carrier will, through the links and levers mentioned, be reciprocated horizontally and transversely in or upon the frame  $R'$ . It will be understood that the card carrier is situated in line with the space  $c'$  between the punch block and the die and, if a card be situated in front of said carrier and the carrier be moved toward said space, is adapted to force such card into the space and in position to be operated upon by the desired number of punches. The card thus thrown into position is prevented from going beyond the point to which it is forced by the card carrier by means of a friction spring  $K$  which is secured to a part of the stationary frame of the machine or to the punch block and bears upon the rear of the latter (Fig. 2). This spring has an upturned end beneath which the card to be operated

upon will be forced by the card carrier. After such card has been punched it will be forced onward (to the right in the machine illustrated) under the spring  $K$  and ejected from the apparatus by the succeeding card as the latter is brought into position to be punched. The ejected card slides outward upon a ledge  $l$  formed upon the rear face of a supporting and guide plate  $L$ . This plate will momentarily sustain the card in an upright position and then permit the card to fall onto the table or any suitable support upon which the machine is mounted. The cards thus delivered from the machine will accumulate in a pile in the same order in which they are punched. The unperforated cards are stored in a magazine  $A$  in proximity to the card carrier, the rear plate or wall of such magazine being formed by the frame  $R'$  (Fig. 4). This magazine is secured to said frame and is preferably open at the top as shown for the introduction of the cards. The magazine is provided with a follower  $A'$  which is adapted to move toward and from the card carrier, but is pressed in the former direction by means of spiral springs  $J$ , being guided in its movements by a rearwardly extending rod  $I$  adapted to slide in a bearing  $I'$  formed upon the rear of the magazine. Said rod is provided with a handle or button  $i$  by which the follower may be drawn back for the purpose of introducing the cards. The cards to be punched are placed to the number of a hundred or more in the magazine  $A$  and the foremost card is held firmly against the frame  $R'$ . At each operation of the card carrier, caused by the depression of the bar  $G$ , the foremost card is forced into the space behind the punches, and there punched by the depression of the proper keys, such operation continuing until the cards in the magazine  $A$  are exhausted. It will be observed that this whole operation requires simply two movements on the part of the operator, one to depress the bar  $G$ , and the other to force down the proper number of keys. If however, more keys should require to be depressed than can be covered by the fingers of the two hands, which will not ordinarily be the case, more than one motion may be required for this purpose.

It will be understood that the key board of the machine illustrated is adapted for a particular kind of life insurance tabulation, and that this arrangement of the keys may be varied to suit the requirements of the work which is to be performed.

What I claim is—

1. In a perforating machine the combination with the series of parallel horizontally acting punches, the supporting and guiding punch block, and a die of the key levers having horizontal and depending arms, and rods connecting the latter arms with the punches, and pivotally secured to the latter substantially as set forth.

2. In a perforating machine, the combina-



- tion with a series of parallel punches, a punch supporting block, a die for the punches, their actuating keys, and rods connecting the keys with the punches and pivotally secured to the latter, of a card magazine or receptacle, an intermittent feed mechanism for carrying card from said receptacle into place before the punches, and a key connected with said feed mechanism, substantially as set forth.
3. In a perforating machine, the combination of the punch block and die having between them a space  $c'$ , a card magazine adapted to supply cards successively in line with said space, a card carrier in line with said space and adapted to engage the card so supplied, an actuating mechanism for said carrier, independent of the punch actuating mechanism, and a key for the same the punches mounted in said punch block, and a key board of levers connected respectively with the punches, substantially as set forth.
4. In a perforating machine, the combination with the key board, a punch block, and a die of the lever G, the punches connected with the keys of said board, a card magazine, and a card carrier adapted to deliver cards from said magazine to the punches and connected with said lever G, substantially as set forth.
5. The combination with the key board, and

the punches connected with the keys thereof, of a punch block, a die the lever G having the extension  $G'$ , the angle lever  $E E^3$ , the link F connecting one arm of the latter with said extension, the reciprocating card carrier D connected with the angle lever, and means for supplying the cards to said carrier, substantially as set forth.

6. In a perforating machine, the combination with the punching mechanism, of the card magazine A, the card carrier D therein, the slotted frame  $R'$ , the cross head or slide T connected with said carrier through the slot of the frame, an actuating lever G, independent of the punch actuating mechanism and connections between the latter and the slide for reciprocating it, substantially as set forth.

7. In a perforating machine the combination with the punching mechanism and the card carrier, of an upright supporting and guide plate L having the ledge or shoulder  $l$  and adapted to deliver the cards successively in order, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN K. GORE.

Witnesses:

GRANT CARPENTER,  
M. M. CARPENTER.