

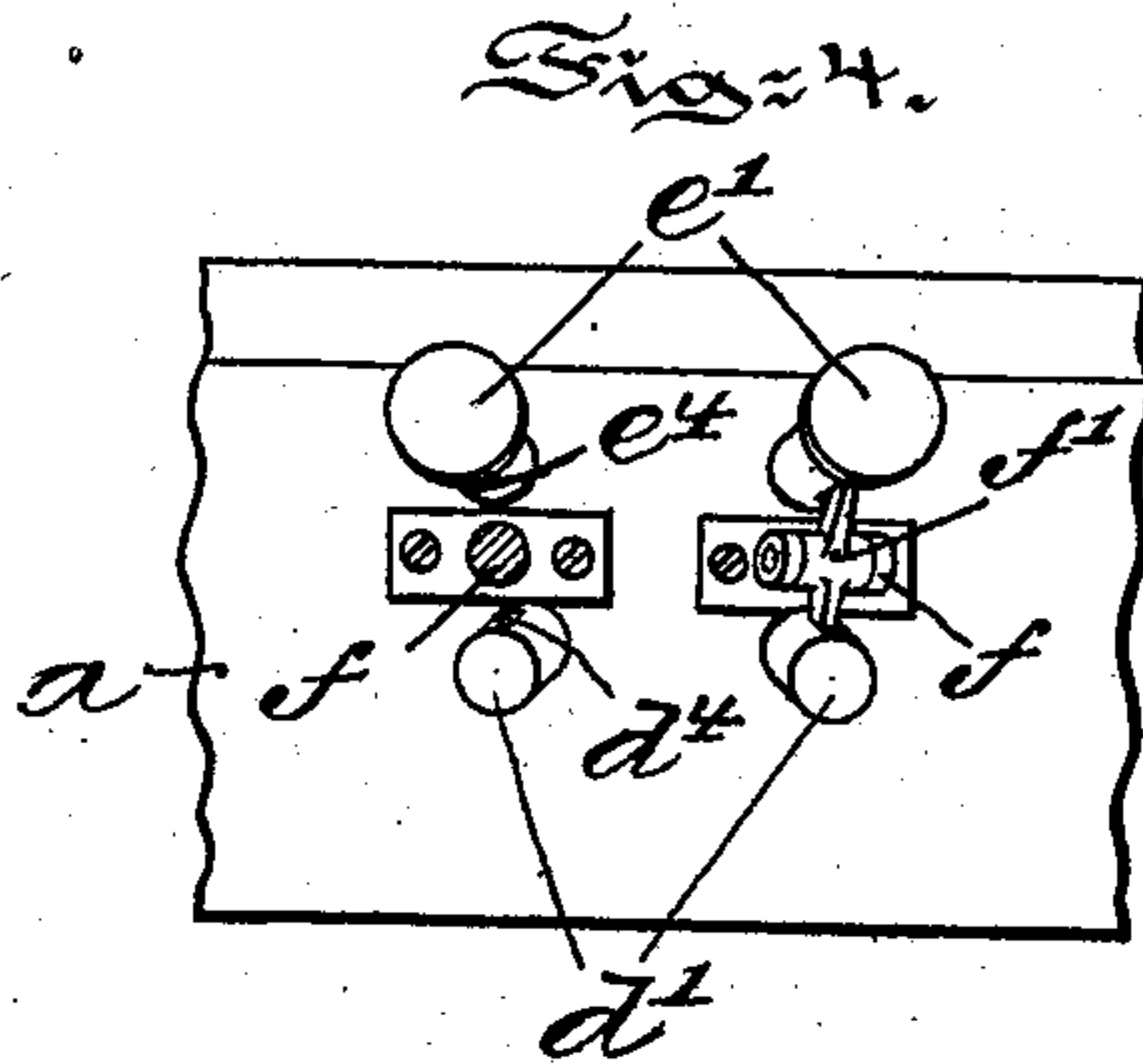
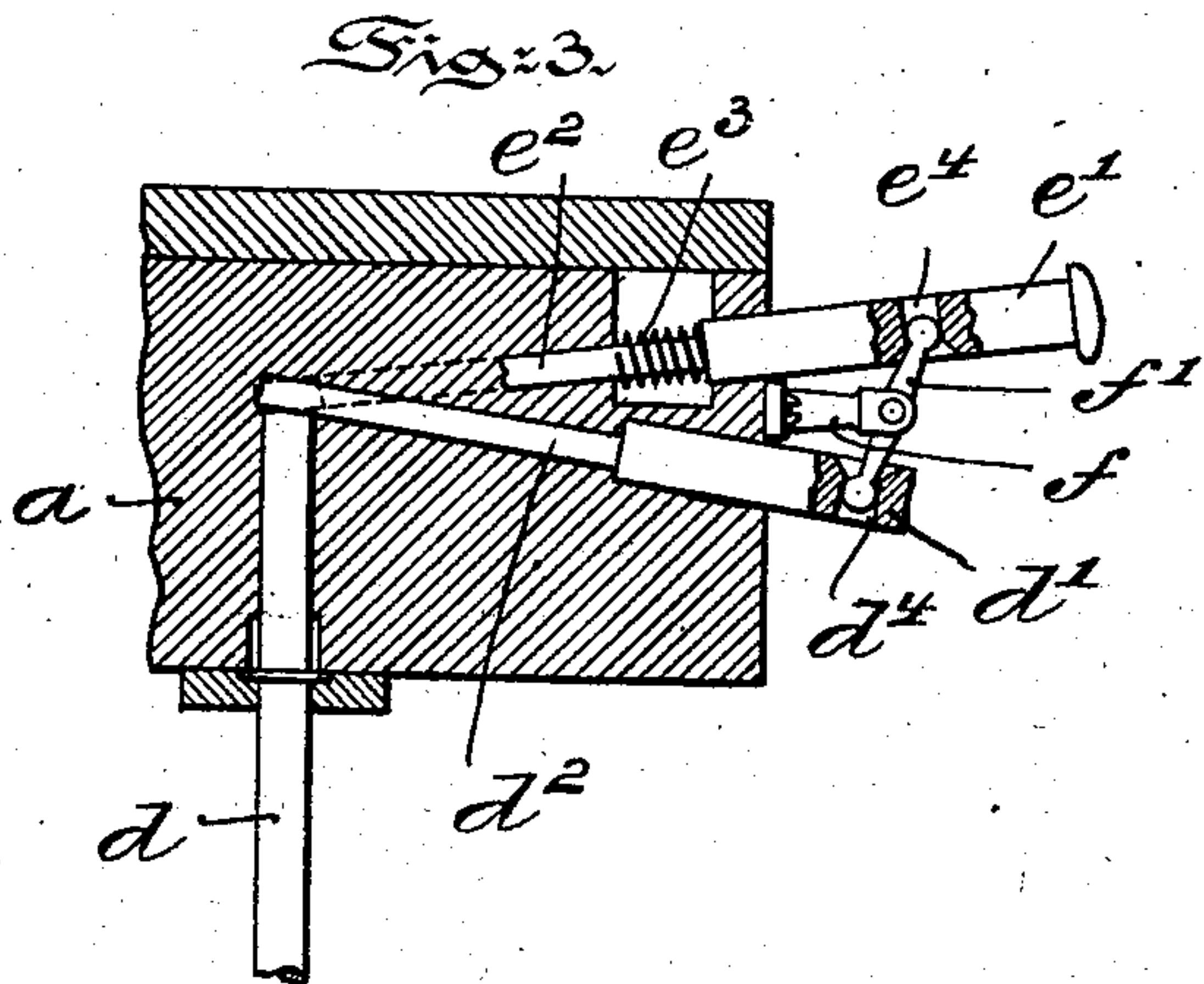
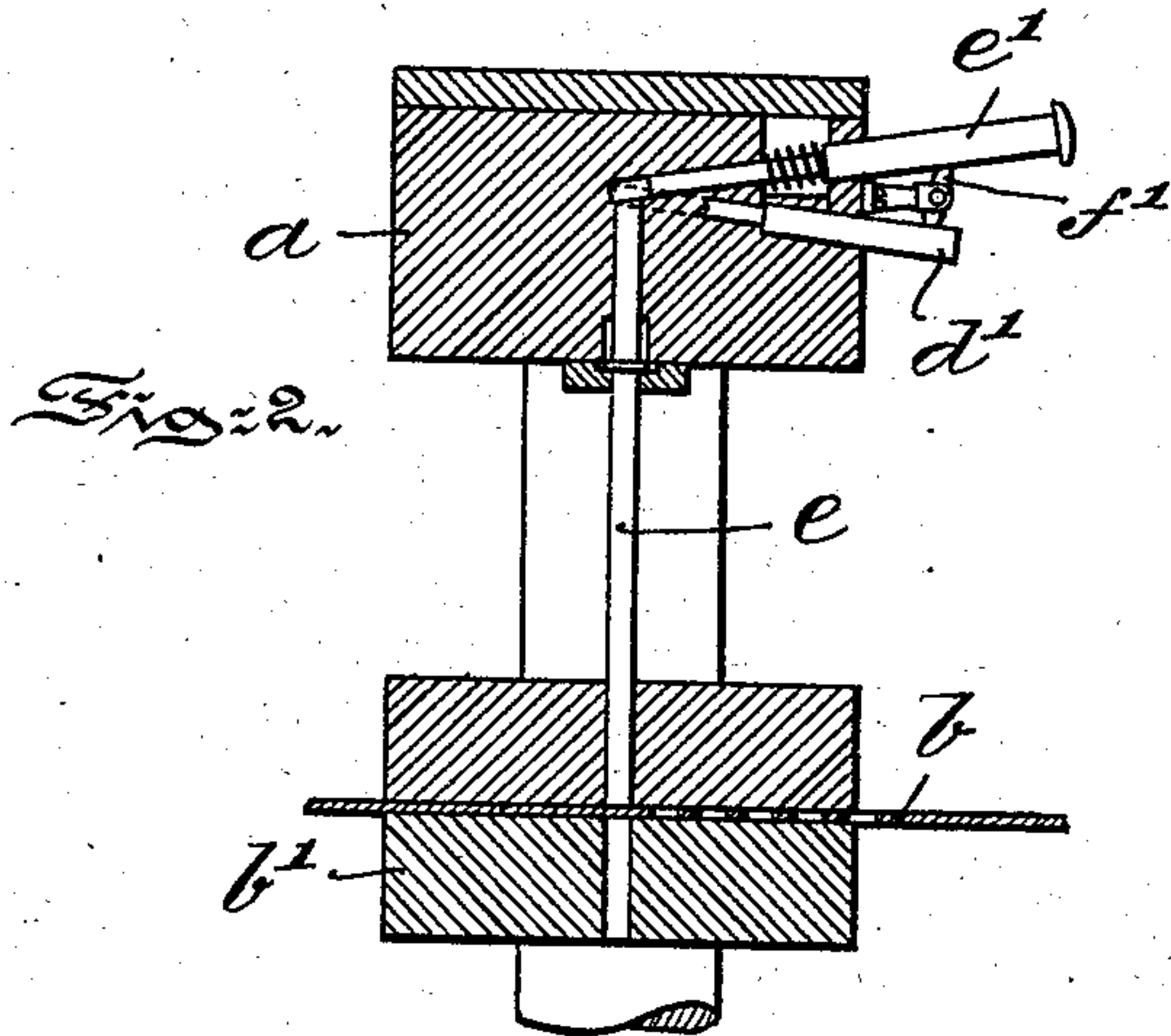
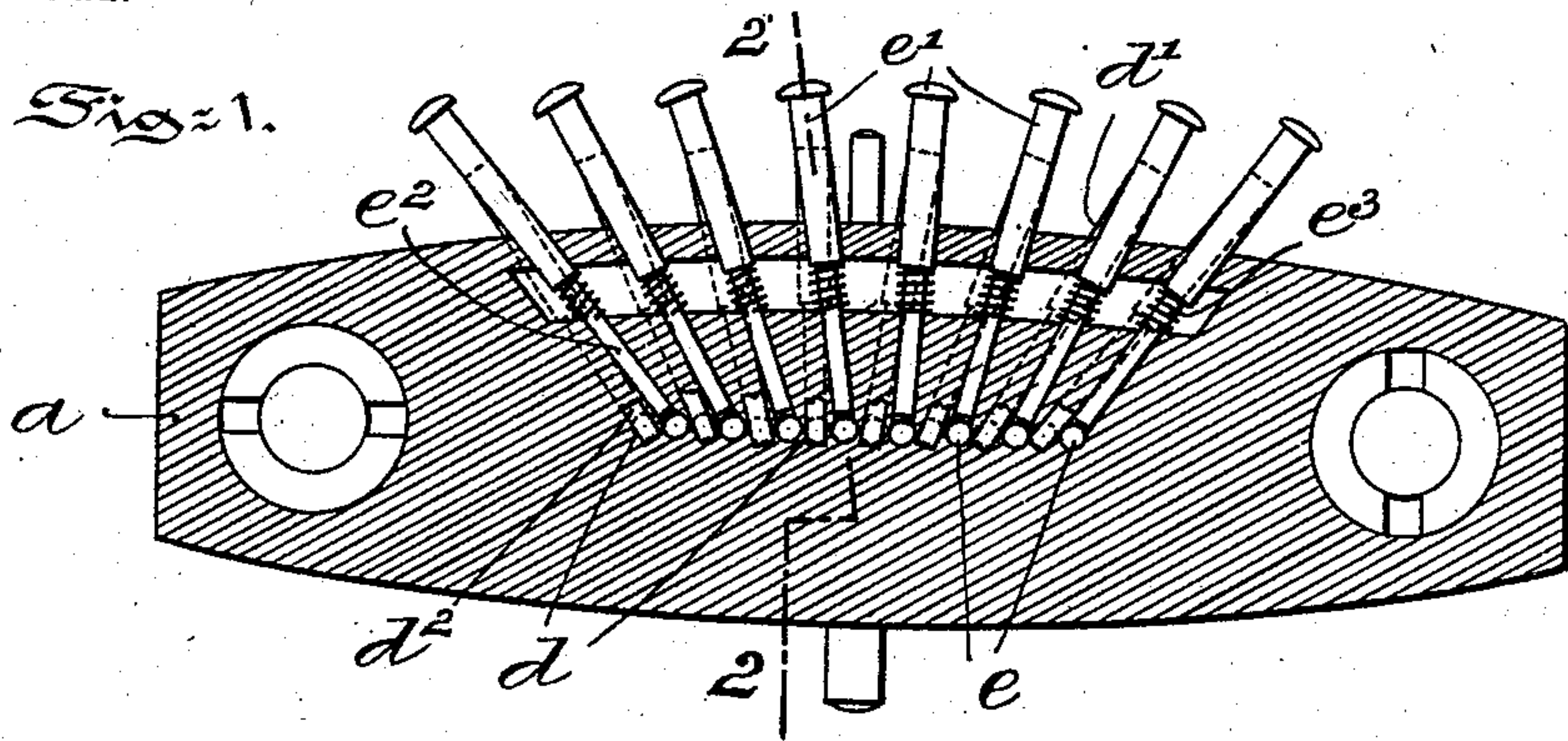
No. 724,674.

PATENTED APR. 7, 1903.

J. B. DAVIDSON.
PIANO CARD PUNCHING MACHINE.

APPLICATION FILED JAN. 16, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

JAMES B. DAVIDSON, OF PHILADELPHIA, PENNSYLVANIA.

PIANO CARD-PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,674, dated April 7, 1903.

Application filed January 16, 1903. Serial No. 139,249. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. DAVIDSON, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Piano Card-Punching Machines, of which the following is a specification.

My invention has relation to that class of card-punching machines known as "piano-machines," in which rows or banks of punches are placed under control of levers or push-keys; and in such connection it relates to the construction and arrangement of the punches and of the mechanism for controlling the same.

Heretofore it was usually customary to arrange the punches in a row containing eight punches and to provide each punch with a mechanism for temporarily locking the punch in the head carrying the punches, the punches and locking mechanism being so arranged that the punch was free of the locking mechanism unless the mechanism was operated by means of a key or button.

Where more than eight punches were required—as, for instance, when irregular holes were to be punched into the card intermediate of the regular holes and the punching was to be done at one operation—it was customary to have for each additional or irregular punch an additional mechanism for locking the same to the head and as in the case of the eight regular punches the additional punches were arranged normally free of the locking mechanism.

The principal object of my present invention is to simplify that form of punching-machine wherein additional or irregular punches can be used. In the simplification of the aforesaid construction the locking mechanism for each of the regular punches is preferably so arranged that normally each regular punch is locked to the head and may be released only by operating the key or button controlling the locking mechanism, and in addition to this preferred arrangement of regular punches each of the irregular or additional punches is reversely arranged with respect to its locking mechanism, and a locking mechanism for a regular punch is so connected or coupled with the locking mechanism

for an adjacent additional or irregular punch that when the locking mechanism for the regular punch is operated to release the regular punch from the head the other locking mechanism is operated to lock an adjacent irregular punch to the head, and vice versa.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a horizontal sectional view of the head or block of a piano card-punching machine, illustrating the regular and additional punches and the coupled locking mechanisms for said punches embodying main features of my invention. Fig. 2 is a vertical sectional view taken on the line 2 2 of Fig. 1. Fig. 3 is a view corresponding to Fig. 2, but enlarged and further sectioned or broken away to more clearly illustrate the coupling or connecting mechanism and Fig. 4 is a side view, partly in section, of Fig. 3.

In the drawings only the head or punch-carrying portion of the machine, together with such auxiliary parts as are necessary to understand the present invention, have been illustrated. The head *a* is of the usual form and is operated in the usual manner. The card *b* to be punched travels in the table or bed *b'*, perforated, as is customary, to permit the punches to traverse the table *b'* and card *b*. In the head *a* are arranged two series of punches, one series, *d*, being the regular or even punches and the other series, *e*, being the additional or odd punches and alternating with the punches *d*. At the side of the block or head *a* are arranged a series of eight keys or buttons *e'*, formed on the ends of pins or levers *e²*, which traverse openings formed in the block or head *d*, which openings terminate above the respective additional punches *e*. A spring *e³* or equivalent mechanism normally tends to retract the pins *e²*, so that the inner ends of said pins clear the tops of the additional punches *e*. A row of buttons or keys *d'*, arranged, preferably, below the keys *e'*, control the pins *d²*, traversing the head *a* and normally extending therein to a point above the head of each punch *d*. The two keys *e'* and *d'*, which control the first additional and the first regular punch *e* and *d*,

respectively, are coupled or connected together by the following preferred mechanism: On the side of the head *a* is secured a bracket *f*, in which is pivoted intermediate of the ends an oscillating arm or lever *f'*. The ends of this lever *f'* respectively engage and are locked in a slot *e⁴* and a slot *d⁴*, formed in the keys *e'* and *d'*, as clearly illustrated in Fig. 3. It follows that when so coupled or connected together a movement inward of the key *e'* against the tension of its spring *e³* will through the lever *f'* draw the key *d'* and its pin *d²* outward away from the punch *d*, whereas a reverse movement of the key *e'* under tension of the spring *e³* will move the lever *f'*, so that the pin *d²* is pushed inward in locking engagement with the punch *d*. The second regular and irregular punches *d* and *e* have their keys coupled, as before described, and all the punches are similarly coupled.

In the operation of the machine the pins *d²*, controlling the regular or even punches *d*, are normally thrown inward to lock the punches *d* to the head *a*. When a regular or even punch *d* in series is to be rendered inoperative and an irregular or odd punch *e* is to take its place, the key *e'* controlling said odd punch *e* is depressed and its pin *e²* forced inward to lock said punch *e* to the head. As before explained, this inward movement of the pin *e²* will through the coupling-lever *f'* serve to retract the pin *d²* away from the regular or even punch *d*, and hence said punch *d* will be released from the head. In a similar manner a plurality of keys *e'* may be operated, so that two, three, or even all of the regular punches *d* can be thrown out of action and their places taken by irregular or odd punches *e*. Of course it is to be understood that, if desired, the keys *e'* and pins *e²* may be so arranged as to be normally in locking engagement with the odd punches *e*. In such case the keys *d'* and pins *d²* would normally be retracted from the even punches *d* to release the punches *d* from the head *a*. In the drawings the pins *e²* and *d²* are illustrated as traversing the head *a* in converging planes. This is preferable where it is expedient to make the punches *d* of the same length as the punches *e*. Where the punches *d* are smaller in length than the punches *e*, the pins *e²* can be arranged to traverse the head in a plane above and parallel with the plane in which the pins *d²* move.

Having thus described the nature and ob-

ject of my present invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for punching jacquard or similar cards, a head, a regular punch and an additional punch arranged adjacent to each other in said head, a mechanism for locking the regular punch to the head, a mechanism for locking the additional punch to said head, and a mechanism coupling said locking mechanisms together and arranged so that when one locking mechanism is operated to lock its punch to the head the other locking mechanism is operated to release its punch from said head.

2. In a card-punching machine, a head, two series of punches arranged alternately odd and even in said head, a series of locking mechanisms for the odd punches arranged so that the odd punches are normally released from said head, a series of locking mechanisms for the even punches arranged so that said even punches are normally locked to said head, and a coupling mechanism between respective locking mechanisms and arranged so that the movement of a locking mechanism for an odd punch to lock said punch to the head will operate the even-punch-locking mechanism to release said even punch from said head.

3. In a card-punching mechanism, a head, an even punch arranged in said head, an odd punch arranged in said head adjacent to the even punch, a pin and key normally arranged to lock the even punch to the head, a second pin and key normally arranged to release the odd punch from the head and an oscillating lever coupling the two keys together.

4. In a card-punching mechanism, a head, an even punch and its locking mechanism, a key controlling said locking mechanism, an odd punch and its locking mechanism, a second key controlling the odd-punch-locking mechanism, and a lever pivoted intermediate of its ends in said head and having its ends in slotted engagement with the respective keys.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JAMES B. DAVIDSON.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.