

(No Model.)

2 Sheets—Sheet 1.

J. FELBEL & A. W. STEIGER.
TYPE WRITING MACHINE.

No. 441,948.

Patented Dec. 2, 1890.

Fig 1

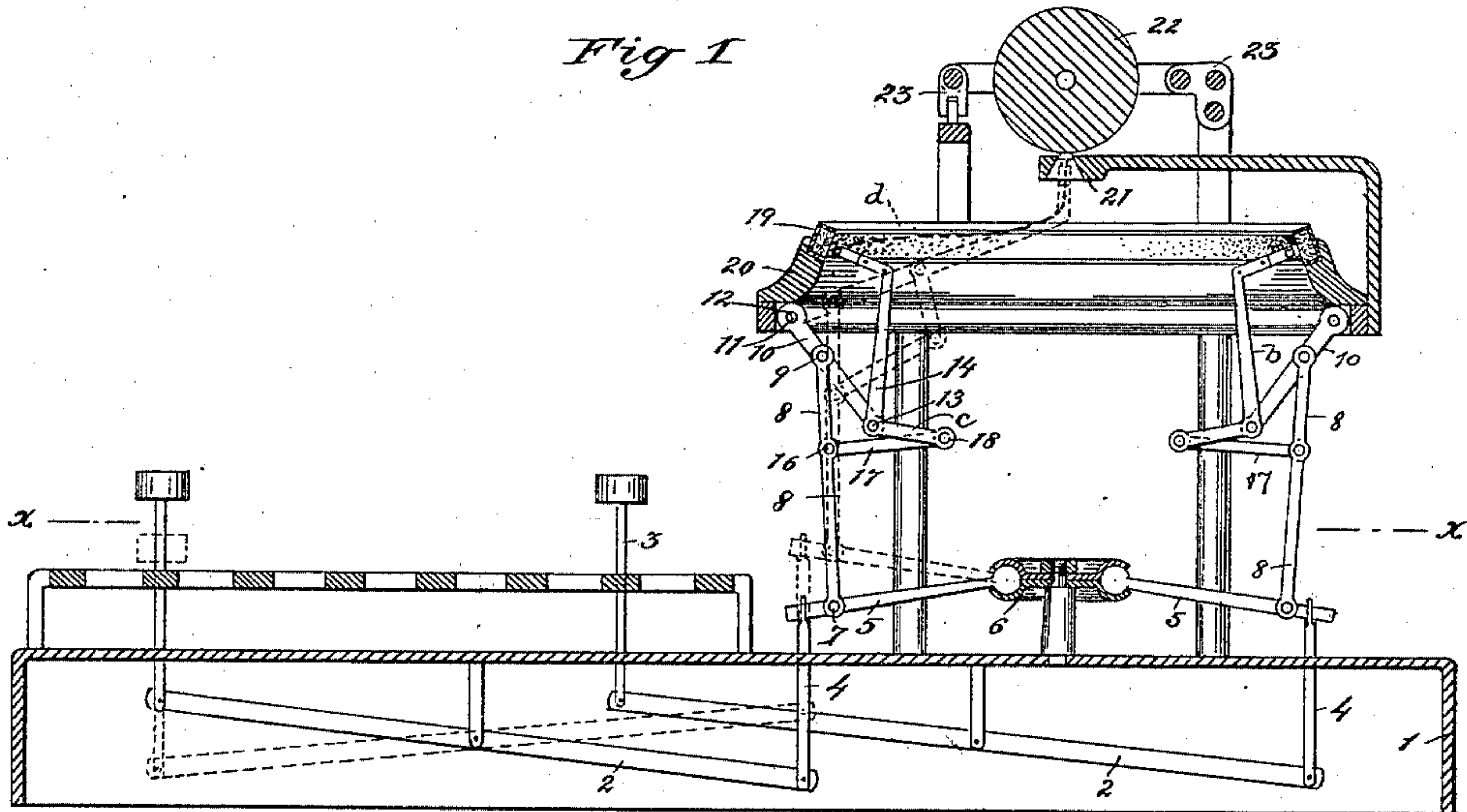
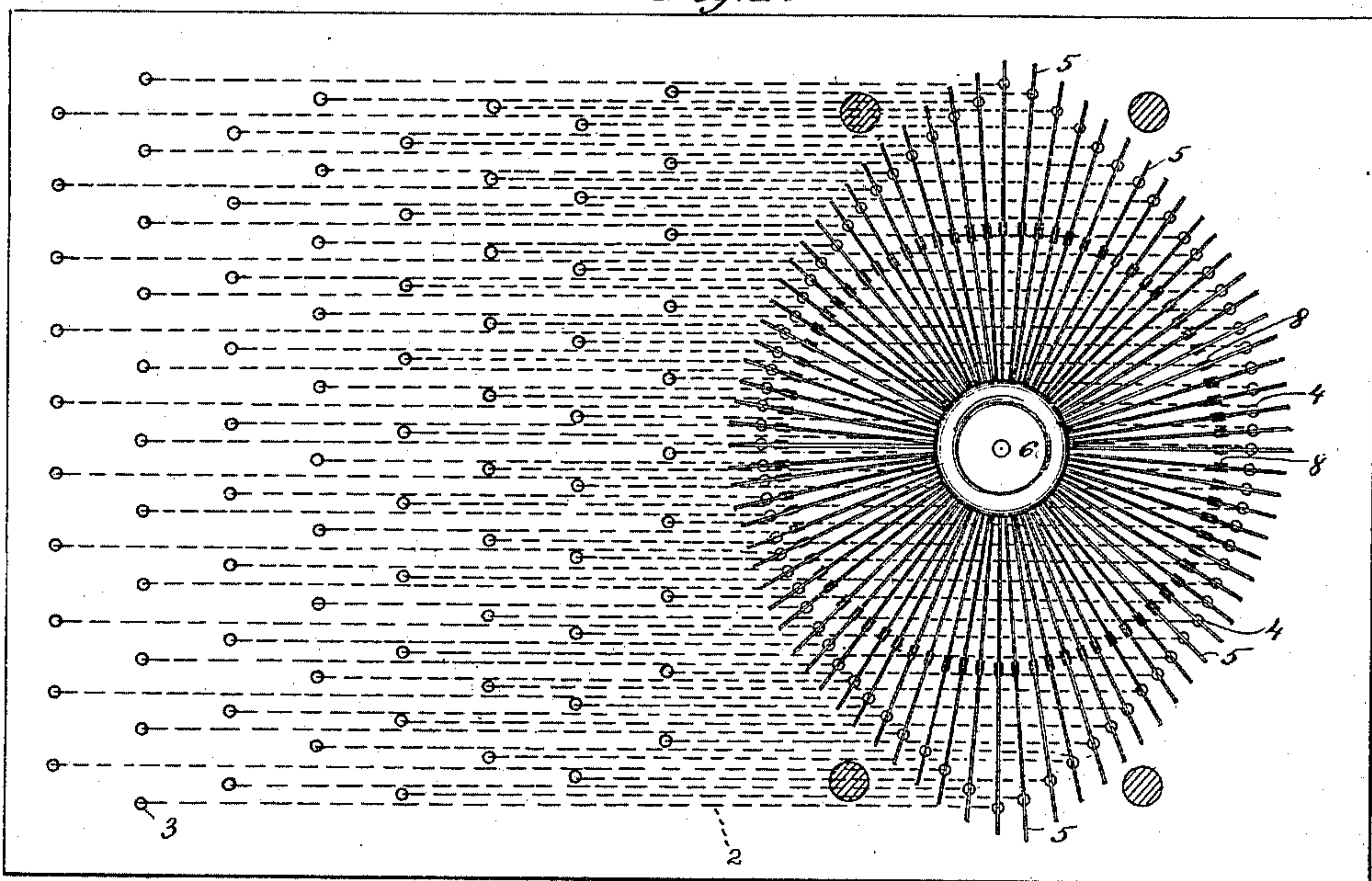


Fig. 2.



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Fig. 3.

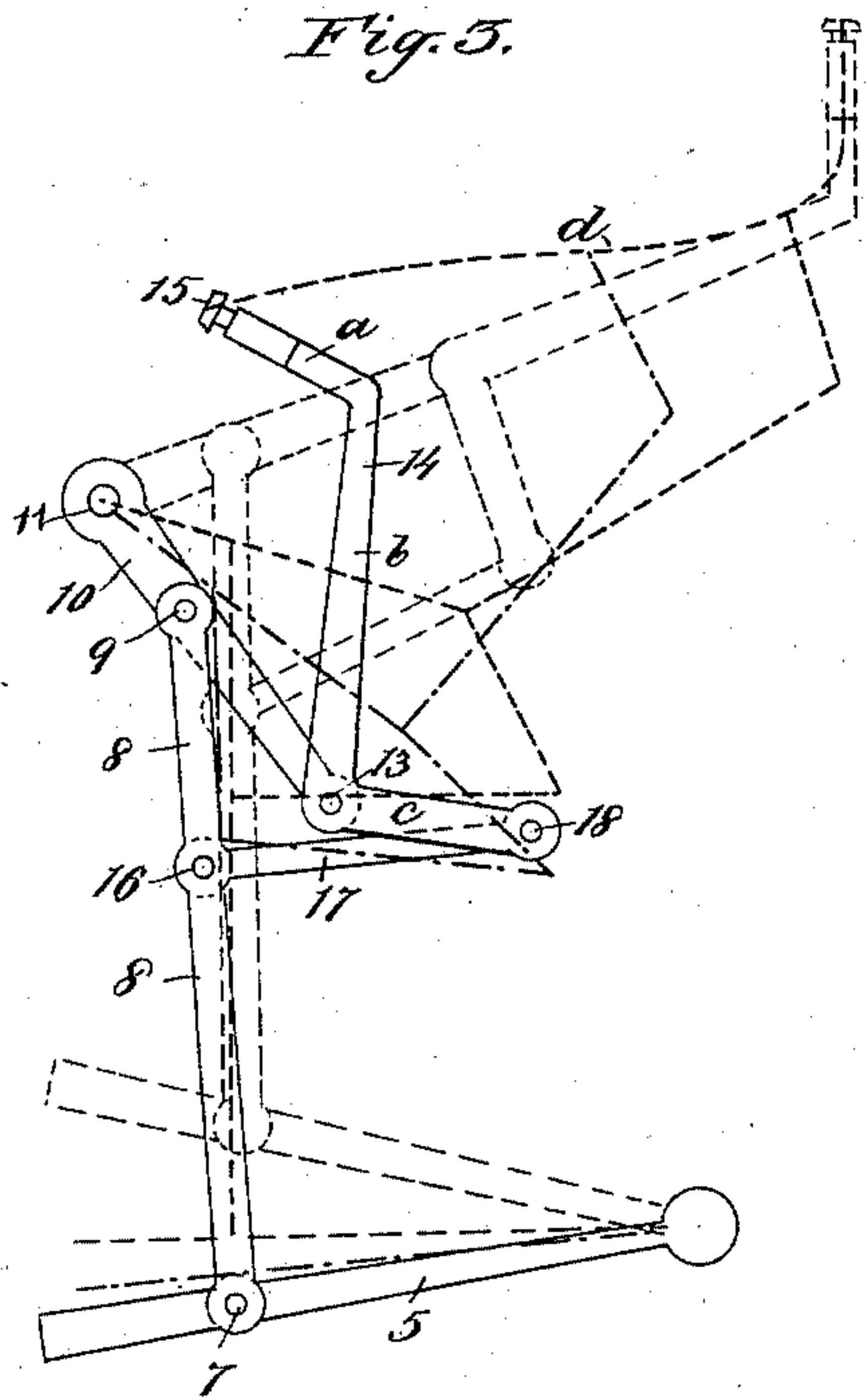


Fig. 4.

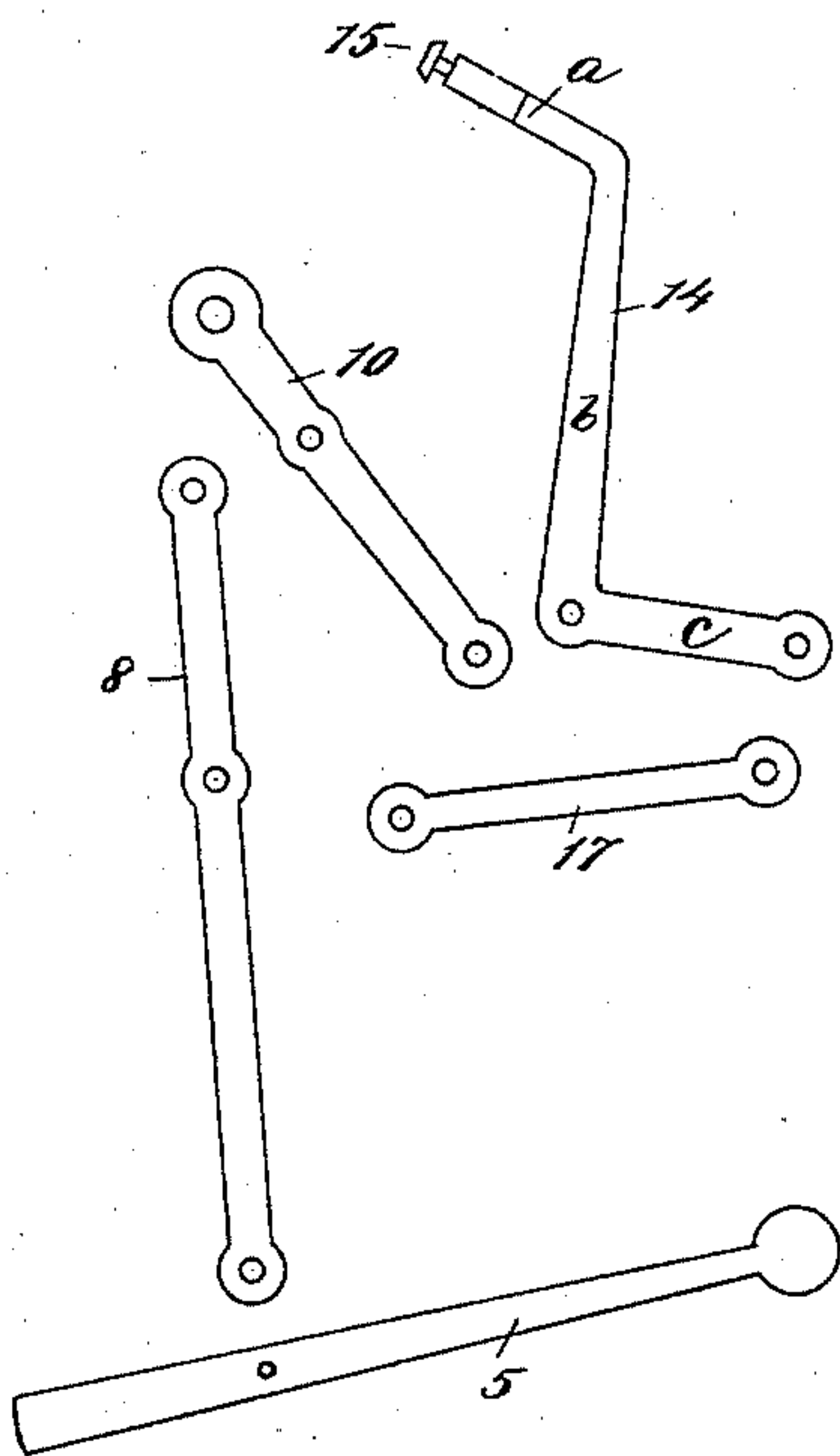


Fig. 6.

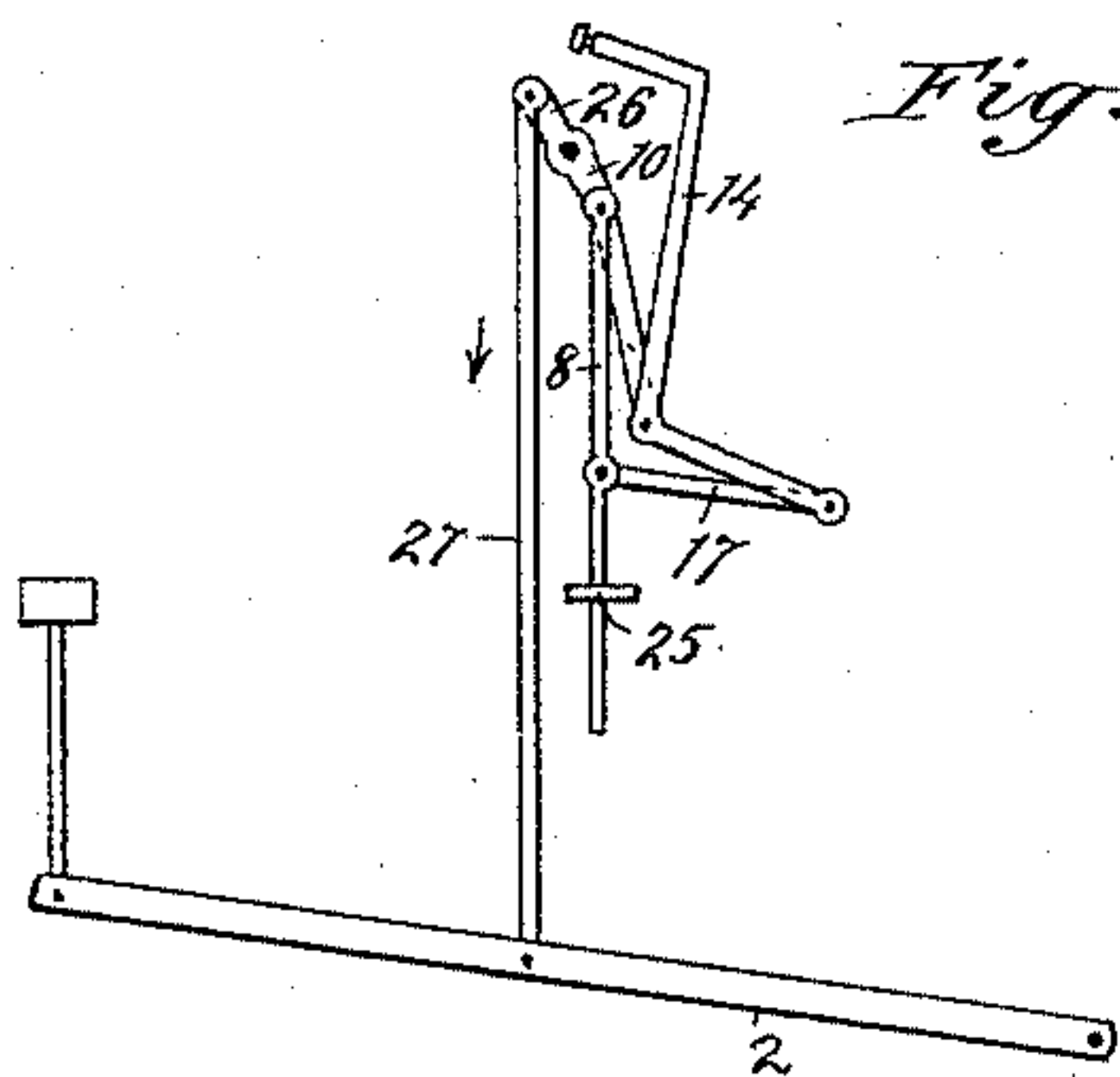


Fig. 5.

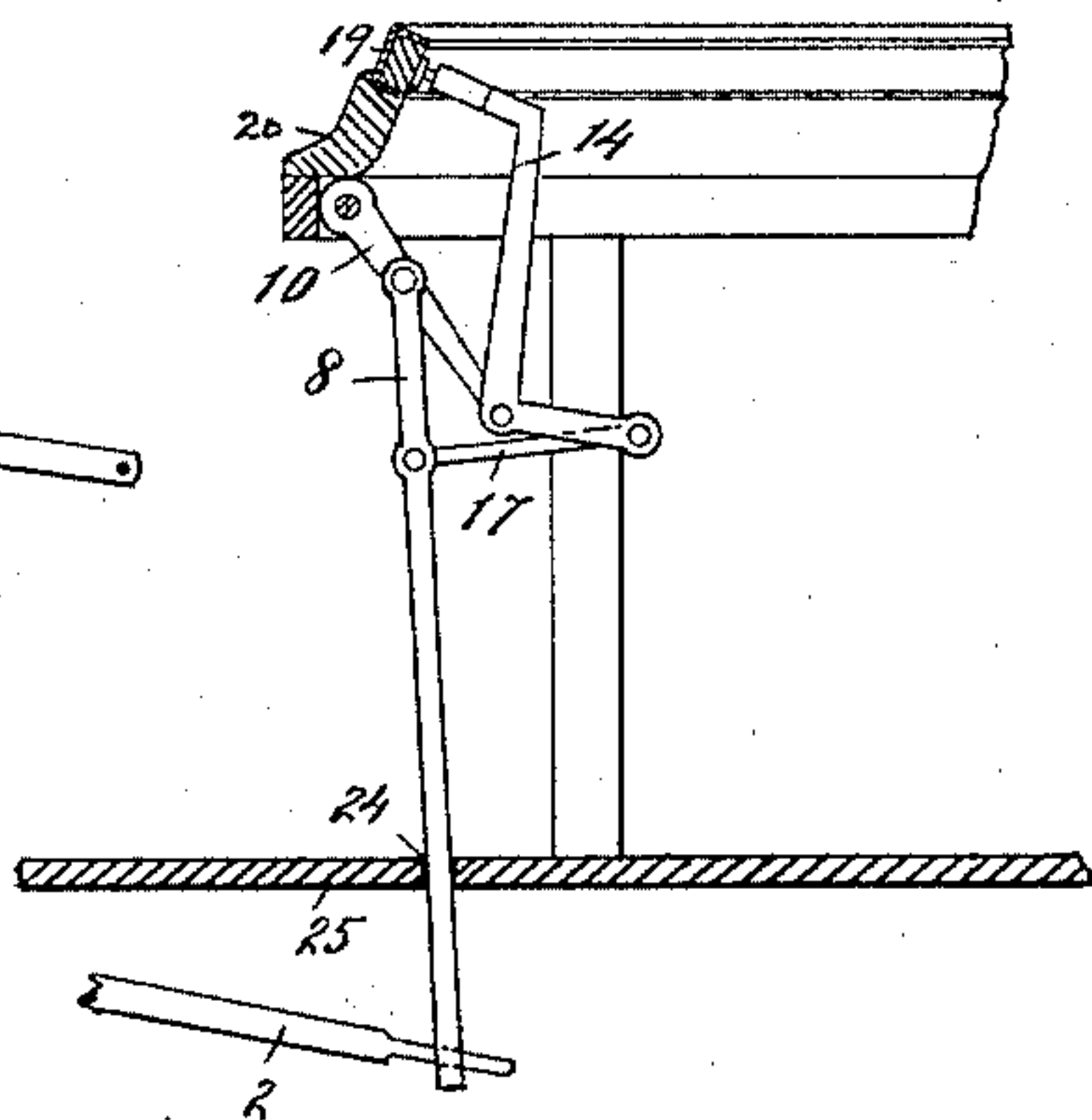
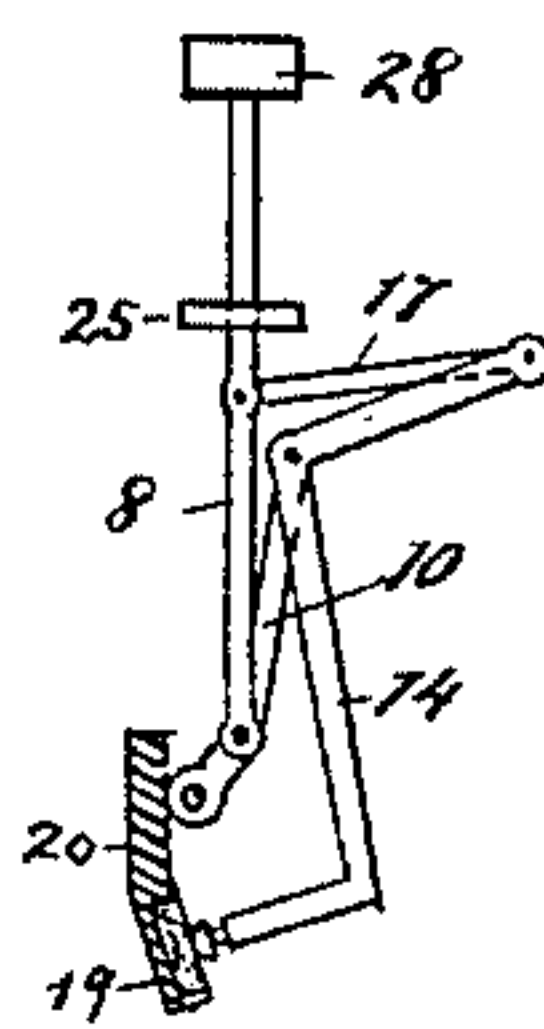


Fig. 7.



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UNITED STATES PATENT OFFICE.

JACOB FELBEL, OF NEW YORK, N. Y., AND ANDREW W. STEIGER, OF BRIDGEPORT, CONNECTICUT; SAID STEIGER ASSIGNOR TO SAID FELBEL.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 441,948, dated December 2, 1890.

Application filed July 17, 1890. Serial No. 359,082. (No model.)

To all whom it may concern:

Be it known that we, JACOB FELBEL and ANDREW W. STEIGER, citizens of the United States, and residents, respectively, of New York city, in the county of New York and State of New York, and Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

Our invention relates to what is known as the "type-movement" of type-writing machines, and has for its main objects to provide a simple and efficient construction.

To these ends our invention consists, primarily, in pivoting the type bar or carrier to two links or levers, each of which is pivoted to a guided rod, and, further, in other features of construction and arrangement, all of which will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of a type-writing machine embodying our invention. Fig. 2 is a horizontal section taken on a plane represented by the line $x x$ of Fig. 1 and omitting the key-board. Fig. 3 is a diagrammatical view on an enlarged scale to show the construction and operation of the type-movement. Fig. 4 is a side elevation of the parts of the type-movement detached. Fig. 5 is a vertical section showing our invention carried out in a modified form. Fig. 6 is an elevation of a further modification, and Fig. 7 is still another modification.

In the several views the same part will be found designated by the same numeral of reference.

1 designates the bed or base plate of the machine, beneath which the key-levers 2 are arranged. These key-levers may be operated through stem-keys 3. At or near the rear end of each key-lever is pivoted a lifter 4, whose upper end passes up vertically through a perforation in the bed-plate, and is connected to the outer end of a radiating lever 5, which is fulcrumed in a stand or support 6, mounted upon the bed-plate centrally of the machine and in line with the impression-point. To the lever 5 is attached at 7 the lower end of an upright rod 8, which is

pivoted at its upper end at 9 to a downwardly-inclined drive link or lever 10, which is fulcrumed at 11, preferably upon a wire ring 12. To the inner free end of said link or lever is pivoted, as at 13, one portion of the type bar or carrier 14, which is made somewhat after the fashion of the letter Z, and is composed of three parts, a , b , and c , the part a carrying the printing-type 15. To the rod 8 at 16 is pivoted the outer end of a substantially horizontal link 17, whose inner end is pivoted at 18 to another portion of the type-carrier—namely, that marked c .

Referring now to Figs. 1, 2, 3, and 4, it will be observed that the rod 8 is prolonged to extend down to the radiating lever 5, which serves to guide said rod. Said rod in turn moves and guides the link or lever 17, and also moves or actuates the link or lever 10. By the combined movements of the guided rod 8, the link 10, and the guided link 17 the type-carrier is caused to travel from its normal to its printing position. Normally the type-carrier is arranged to stand substantially in the position illustrated by the full lines at Fig. 1 and with the type-face resting against an inked pad 19, mounted in or upon a suitable ring, support, or holder 20.

The printing position of the type-carrier is represented by the dotted lines at Fig. 1, in which figure we illustrate the employment of a center guide or directrix 21 beneath the platen 22 of the paper-carriage 23. The guide or directrix 21 may, however, be dispensed with, (although we prefer it,) as may also the inking-pad, for which the usual traveling inking-ribbon may be substituted.

The operation of the construction shown at Figs. 1, 2, 3, and 4 will be understood to be as follows: As the guide-lever 5 is raised by the depression of its key-lever the rod 8 is caused to move upwardly in a determined or fixed path, governed by the lever 5 and the link 10. In moving upward the rod 8 raises the link 10 and the fulcrum or pivot 16 of the link 17, which it guides. By the described action of the guided rod 8 upon the two links 10 and 17 the type-carrier to which they are connected is caused to turn, move inwardly toward the center of the machine, and then, finally, to move in a substantially vertical direction, as shown at Fig. 3 by the diagram of

the movement at different stages or steps. In the full or complete movement of the carrier inward the type is caused to travel, first, in substantially a horizontal direction and then in substantially a vertical direction from the pad or from its position of rest to the platen or the paper to be printed upon, as shown by the dotted line *d* at Fig. 3. In returning to its first position the type-face of course travels in the same path. The levers 5 not only serve to guide the rods 8, but may be made of varying length, as shown at Fig. 2, and extended beyond the circle of rods 8 to connect with their respective key-levers and enable the machine to be built on the "straight-stringing" principle.

Referring to Fig. 5, it will be observed that the elongated portion of the rod 8 is guided in a perforation 24 in a horizontal plate 25, which may be the bed or base plate shown at Fig. 1. The lowermost end of the rod 8 is connected directly to a key-lever 2, thus dispensing with the lifter 4 and guide-lever 5. The operation of this construction is substantially the same as that above described, the desideratum being also attained of moving and guiding the pivot 16 in a well-defined path and in accordance with the movement of the drive-link 10, the rod 8, connecting the two links 10 and 17, making this possible.

Referring to Fig. 6, it will be seen that the extended end of the rod 8 is guided at 25, and that the drive-link 10 is provided with an arm 26 on the outer side of its fulcrum, to which a connecting rod or wire 27 is attached at its upper end, the lower end of said rod or wire being connected to a key-lever 2. This is a lever of the second order, while the key-levers shown in the other views are of the first order or class. The operation of this type-movement is substantially the same as those above described, the main difference being that the power is applied to the drive-link instead of to the rod 8. The effect is nevertheless the same, and for that matter it will be understood that the power may be applied at any desired locality of the type-movement.

Referring to Fig. 7, we have shown our improved type-movement arranged for what is known as an "inverted" machine—that is to say, one in which the type print with a downward instead of upward motion. In this instance the key-levers may be dispensed with and the power applied directly to the extended portion of the rod 8, which may bear a finger-piece or head 28.

By our improved construction the type is made to take the shortest possible path to reach the printing-point, and thus the machine may be rapidly operated. In moving to the printing-point the face of the type is turned from a substantially vertical position to a horizontal position, or turned substantially through an angle of ninety degrees, and is presented perpendicularly to the platen, thus avoiding all liability of blurring. Moreover, by the present construction when the

type has reached the common center of the machine it is moved in a right line a greater distance than heretofore, thus enabling us to secure considerable more room between the type-ring or inking-pad and the platen for the convenient admission of the type-guide, the pressure-roller, the paper-guides, and other devices commonly used on or about the carriage of the machine. Besides, a lower machine, and one composed of a less number of parts, may be made.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of links 10 and 17, pivotally connected each to a type-carrier and to a rod arranged between the links 10 and 17 and adapted to move therewith, substantially as described.

2. In a type-writing machine, the combination of links 10 and 17, pivotally connected at their inner ends to a type-carrier, a rod 8, pivotally connected at 12 to the link 10 and at 16 to the outer end of the link 17, and a guide for the rod 8, substantially as described.

3. In a type-writing machine, the combination of links 10 and 17, pivotally connected to a type-carrier, a rod 8, pivotally connected to said links, and a guide for said rod, substantially as described.

4. In a type-writing machine, the combination of links 10 and 17, pivotally connected to a type-carrier, a rod 8, pivotally connected to said links, and a guide-lever for said rod, substantially as described.

5. In a type-writing machine, the combination of links 10 and 17, pivotally connected to a type-carrier, a rod 8, pivotally connected to said links and having an extension, and a guide for said rod, substantially as described.

6. In a type-writing machine, the combination of links 10 and 17, pivotally connected to a type-carrier, a rod 8, pivotally connected to said links and having an extension, and a guide-lever connected to said extension, substantially as described.

7. In a type-writing machine, the combination of links 10 and 17, pivotally connected to a type-carrier, a rod 8, pivotally connected to said links, a guide-lever, a lifter, and a key-lever, substantially as described.

8. In a type-writing machine, the combination of a downwardly and inwardly extending link 10, a substantially horizontal link 17, a type-carrier connected to the inner ends of said links at the points 13 and 18, and a guided rod 8, connected at 9 to the link 10 and at 16 to the outer end of the link 17, substantially as described.

Signed at New York city, in the county of New York and State of New York, this 15th day of July, A. D. 1890.

JACOB FELBEL.
ANDREW W. STEIGER.

Witnesses:

C. MCCARTHY,
M. E. LEES.