

T. L. KNAPP.
DEAD KEY MECHANISM FOR TYPE WRITERS.
APPLICATION FILED JUNE 2, 1909.

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3 SHEETS-SHEET 1

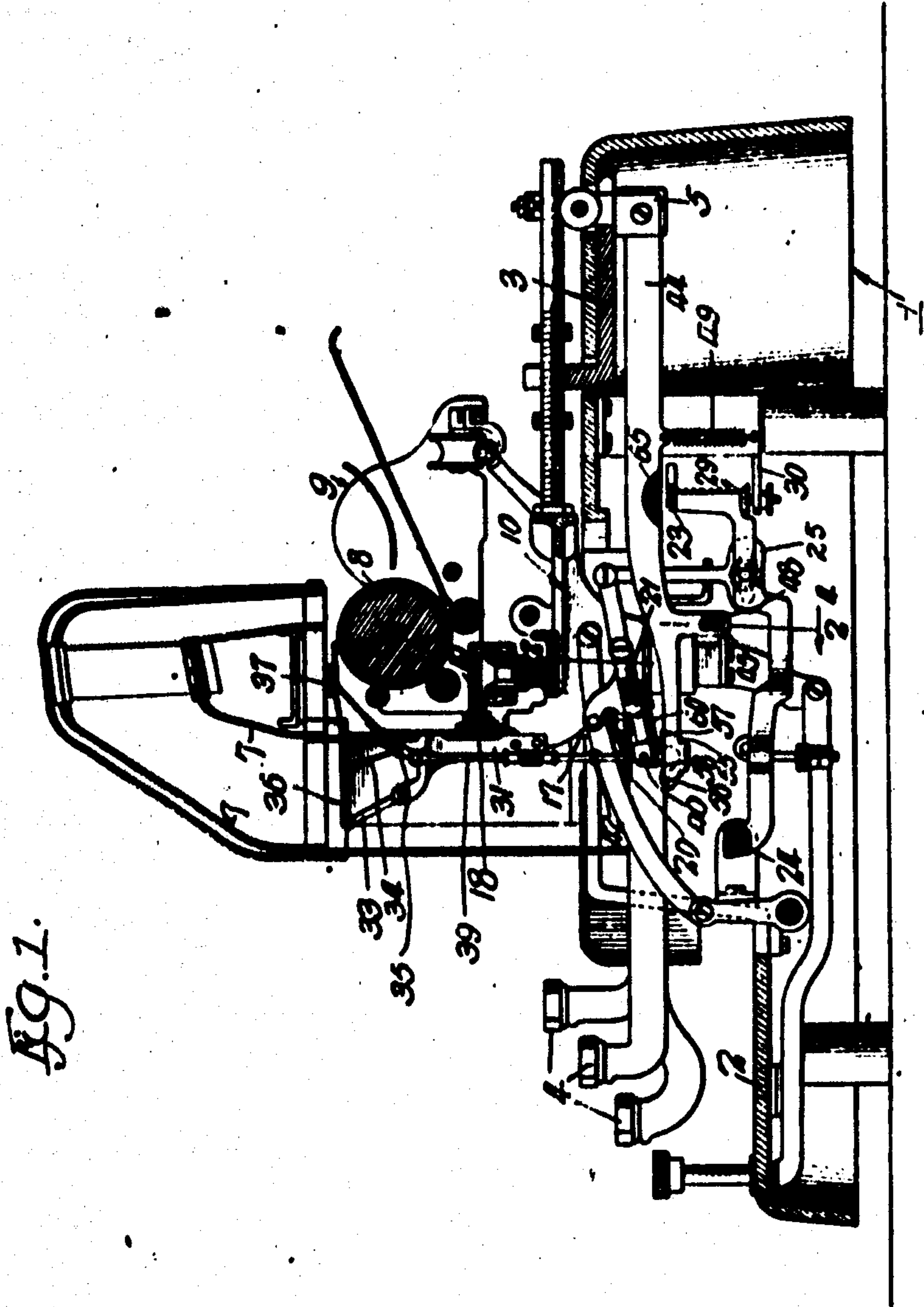


Fig. 1.

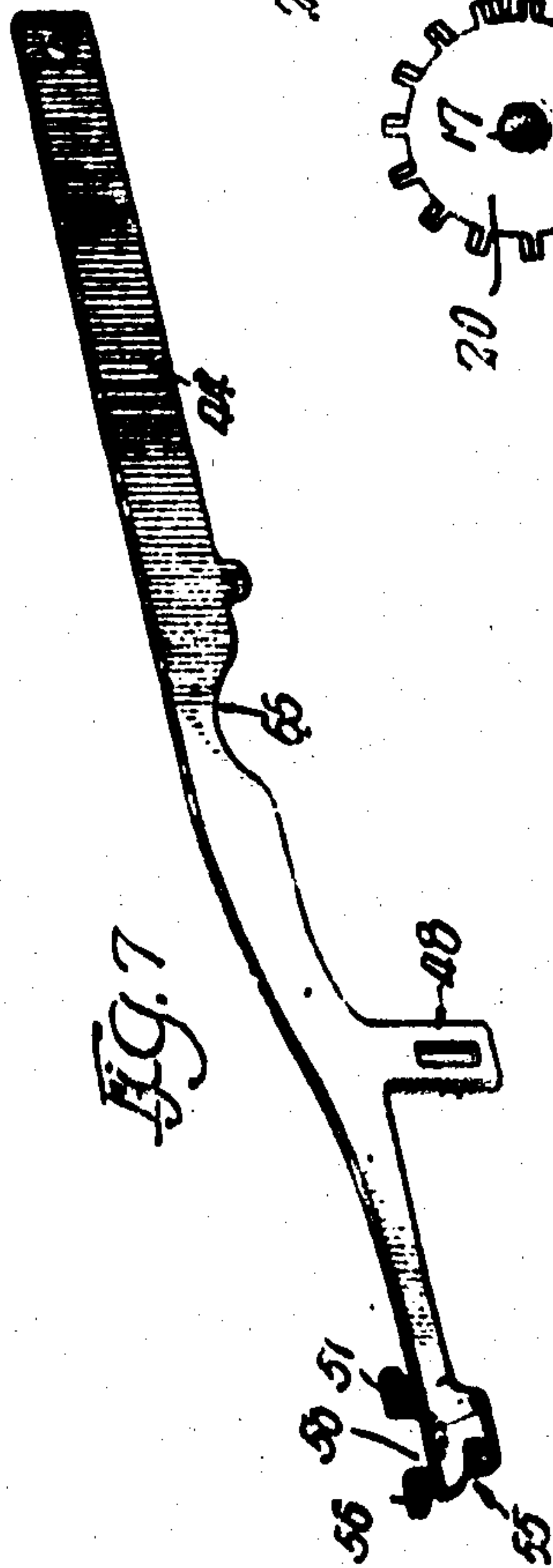
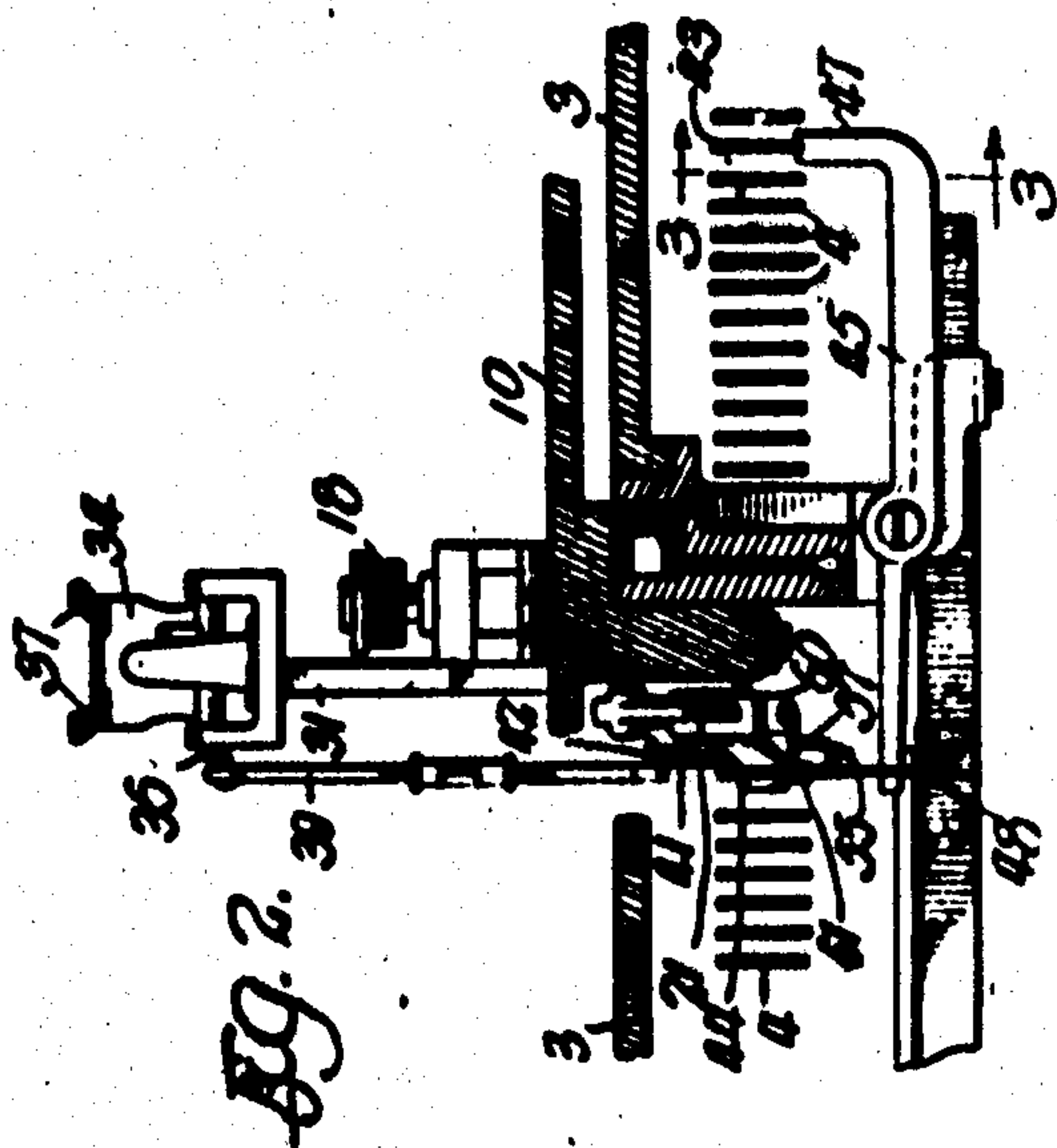
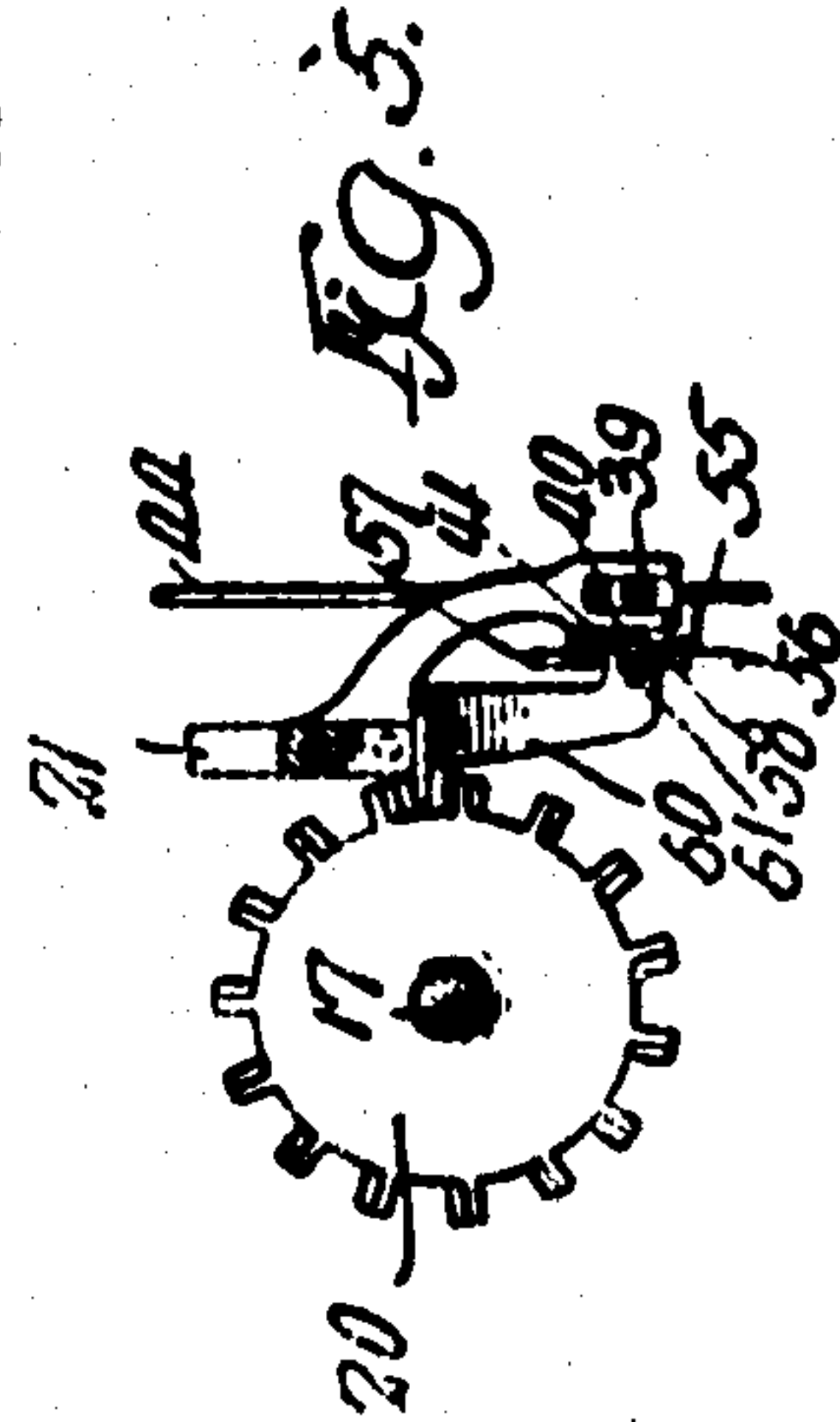
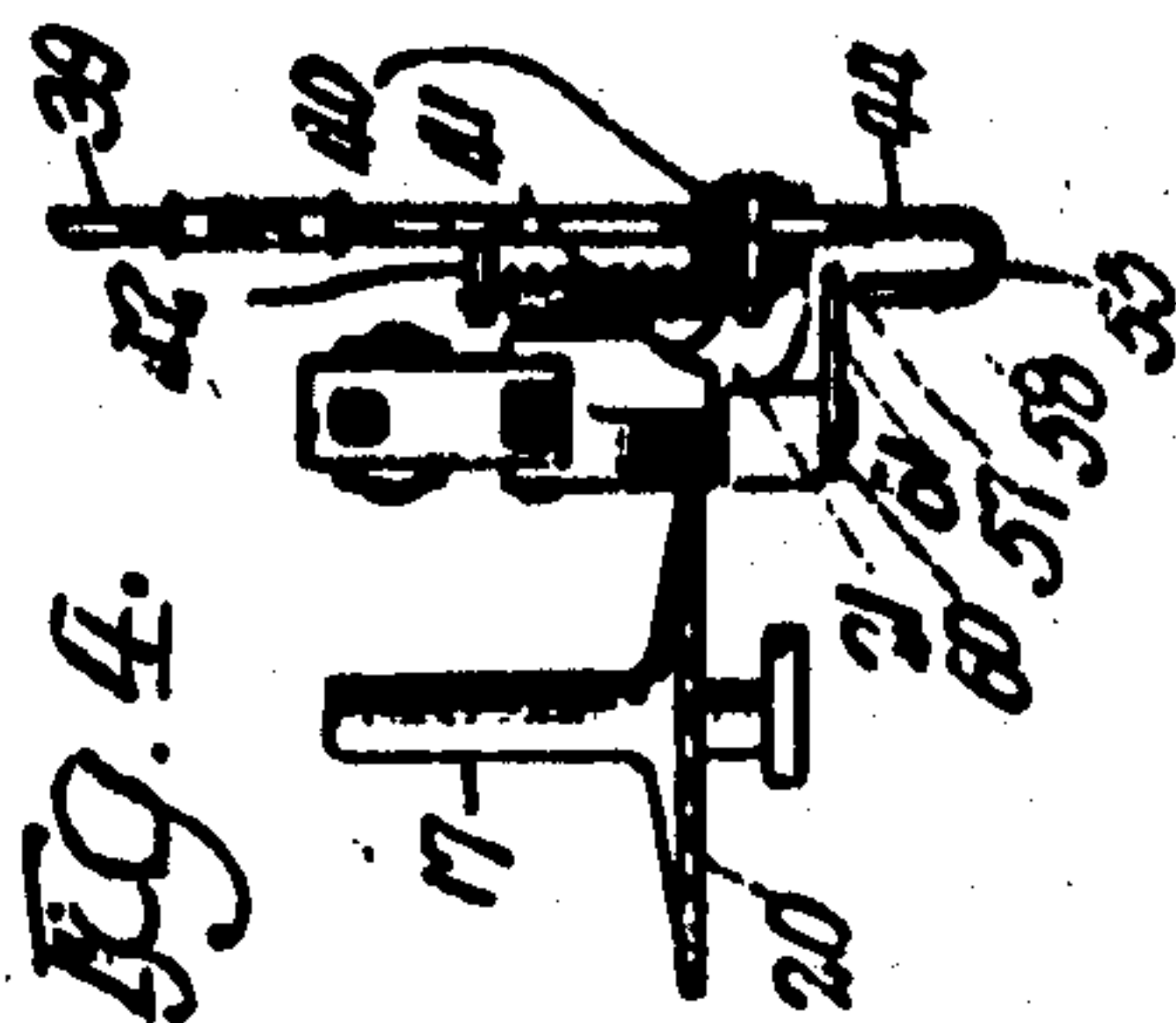
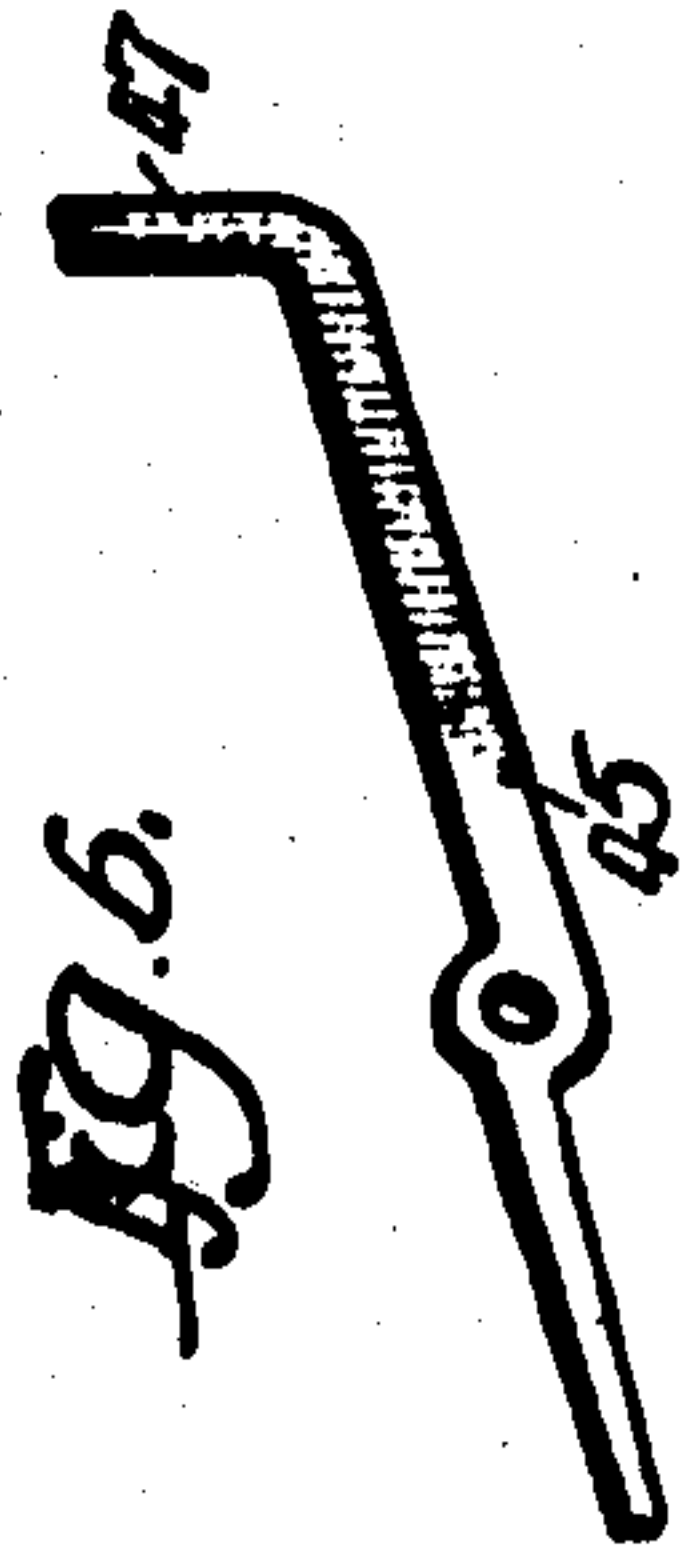
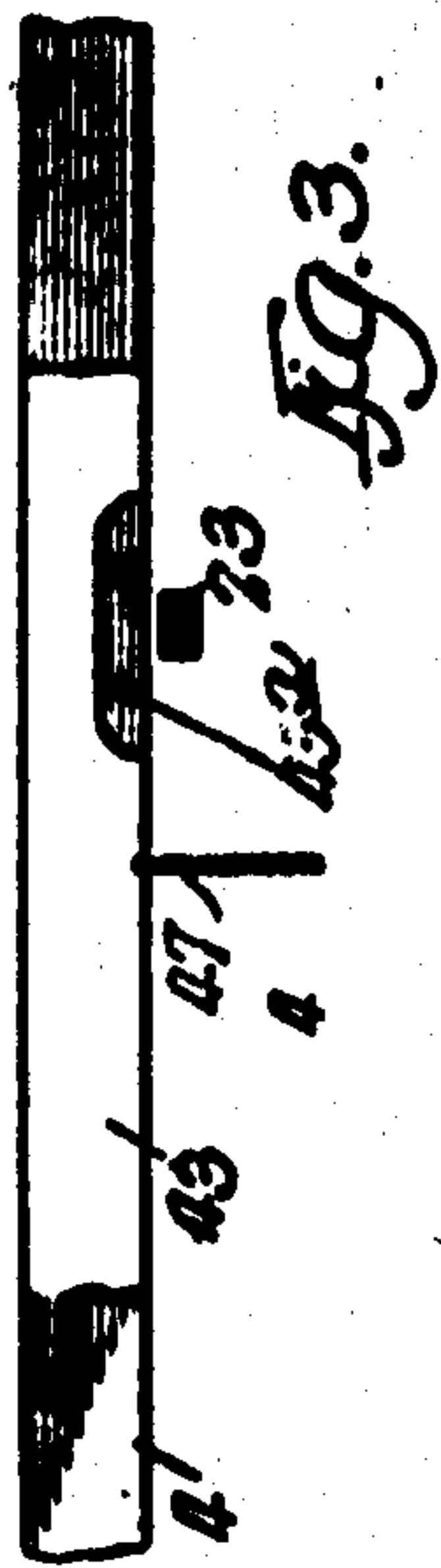
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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DEAD-KEY MECHANISM FOR TYPE-WRITERS.

946,229.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed June 2, 1909. Serial No. 499,900.

To all whom it may concern:

Be it known that I, THERON L. KNAPP, a citizen of the United States, and a resident of Woodstock, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Dead-Key Mechanism for Type-Writers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to improvements in typewriting machines and more especially to means in such a machine wherein in certain positions of the shift-frame certain characters may be printed without any feed movement of the paper-carriage under the action of the letter-spacing mechanism, as is necessary, for instance, in printing special characters, such as accents over or in connection with the regular characters or letters, whereas in other positions of the said shift-frame feed movement will be given to the paper-carriage by the same key which operates the type-bar carrying the special character. Types for printing special characters are operated by one or more key-levers which effect movement of said types without actuation of the letter-spacing mechanism of the machine and which are for this reason usually termed "dead-keys".

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the accompanying drawings in which the invention is shown as embodied in a typewriter of the "Oliver" type:—Figure 1 is a view in central, vertical, longitudinal section of a typewriter embodying my invention. Fig. 2 is a transverse, vertical, detail section taken upon line 2—2 of Fig. 1. Fig. 3 is a fragmentary section taken upon line 3—3 of Fig. 2. Fig. 4 is a vertical fragmentary section of parts of the escape and ribbon-throw mechanism. Fig. 5 is a horizontal fragmentary section of the parts illustrated in Fig. 4. Fig. 6 is a perspective view of a lever which connects the auxiliary key-lever with parts which operate the ribbon-throw mechanism. Fig. 7 is a perspective view of the operating lever which is operated by the lever illustrated in Fig. 6.

In said drawings, only such parts of the typewriting machine are shown as are essential to an understanding of the application of the invention hereto. The general construction of the machine is like that shown in the prior United States Letters Patent to Thomas Oliver, No. 599,863, granted March 1st, 1898; and its details other than those relating to the present invention are similar to those illustrated in the prior United States Letters Patent to Knapp, No. 904,208, granted November 17th, 1908.

As shown in the said drawings, 1 is a base-plate provided with a lower forward horizontal part 2 and a rear elevated horizontal part 3.

4, 4 are key-levers pivoted to a block 5 depending from the part 3 and are connected to the type-bars 7, 7.

8 is a platen mounted on a paper-carriage 9 which is supported upon a shift-frame 10. An upright escape-wheel shaft 17 mounted upon the shift-frame 10 is provided at its upper end with a gear-pinion 18 adapted to engage rack-teeth formed on a frame-bar 19 on the paper-carriage and at its lower end with an escape-wheel 20 which is engaged by an escapement-lever 21 to permit the feed movement of the paper-carriage. The said escapement-lever is operatively connected with an oscillating frame comprising a space-bar 23, a rock-shaft 24 and a plurality of arms rigidly connecting said rock-shaft with said space-bar. The said space-bar is actuated by the depression of the key-lever to give letter-space movement to the paper-carriage in a well known manner. The escapement-lever 21 is connected with the space-bar frame by means of a slotted yoke 25. An expansively acting spiral spring 26 is arranged to bear upwardly against the said space-bar.

The ribbon-throw device is the same as that shown and described in the prior patent to Knapp No. 904,208 and comprises a vertically arranged rigid supporting arm 31, two parallel oscillating links 33 and 34 supported at the upper end of said arm 31, a guide-plate 36 which extends toward the platen and is provided with ribbon guide loops 37, 37. A rock-shaft 35 supports the link 34 and is operatively connected with the escapement-lever 21 by means of a connecting rod 39 which is provided in its

lower end with a slot which is engaged by a pivot-pin 40 inserted through one end of the said escapement-lever.

41 designates a contractile coiled spring attached at its upper end to a laterally projecting stud 42 and at its lower end to the extending end of the pivot-pin 40. A dead-key lever 43 extending from front to rear of the machine is pivoted in the fulcrum block 5 and is connected with a type-bar which carries the special type to be operated by said lever, but which type-bar is like others of the series of type-bars 7, 7. Said dead-key lever is notched or cut away at a point 15 on its lower edge, as indicated at 43^a, at a point above the space-bar 23 so as to permit depression of said key-lever without contact with or operation of said space-bar.

A horizontal operating lever 44 pivoted to the fulcrum block 5 is arranged with its forward end beneath and in position for contact with the lower end of the connecting rod 39 in such manner that upward movement of the forward end of said lever will lift the said connecting rod and move the ribbon over the platen. The said operating lever 44 is operatively connected with the dead-key lever 43 by means of a transversely pivoted lever 45 which extends from a point 20 beneath the auxiliary key-lever 43 to a point beneath the operating lever 44, and is provided at its end beneath said key-lever with an upwardly extending notched arm 47 adapted for contact with said dead-key lever. 25 At its other end the said lever 45 engages an integral depending slotted arm 48 on the operating lever 44. A contractile coiled spring 49, connected at its upper end with the operating lever and at its lower end with a bracket 30, normally holds the forward end of the lever at the downward limit of its movement.

The above parts are all as illustrated in the *Letters Patent No. 599,868* and 45 *No. 904,868*, and need not be herein more fully described as they form no part of this invention.

Referring now to the features of construction whereby, in certain positions of the 50 shift-frame the operation of the dead-key lever will act upon the ribbon-throw device only and in other positions thereof will also act upon the escapement-lever to give letter-space movement to the paper-carriage, the 55 same embraces features of construction as follows: Formed upon the forward end of the operating lever 44 (Figs. 5 and 7) is an upturned member 55 which is spaced laterally from that portion of the end of 60 said lever which is adapted to engage the lower end of the connecting rod. The said upturned member 55 is preferably U-shaped, it being formed with legs 56 and 57 and with a space 58 between the said legs. Secured 65 to the lower face of the escapement-lever 21

is a forwardly extending plate 60 which is provided at its forward end with a projection or finger 61. The said projection or finger is arranged at right angles to the plate 60 and extends toward the connecting rod 39. When the shift-frame 10 is in its normal or mid-position the projection or finger 61 will be directly above the recess 58 in the upturned member 55 of the operating lever 44 so that the operation of the said 75 lever 44 will be ineffective to operate the escapement-lever 21 but the ribbon will be moved to the printing position by reason of the engagement of the forward end of the lever 44 with the lower end of the connecting rod 39 in the manner described. 80 Since, however, the escapement-lever 21 is movable with the shift-frame the movement of the said shift-frame either to its forward or backward position will bring the projection or finger 61 into position to be engaged 85 either by the leg 56 or 57 upon the upturned member of the operating lever 44 which, in the operation of the said lever, will operate the escapement-lever 21 to give letter-space 90 movement to the platen. At a point in its length above the space-bar 23 said lever 44 is notched in its lower edge, as indicated at 65, to allow rising and falling movement of said lever without its coming into contact 95 with said space-bar. With this construction it will be seen that when the shift-frame is in its normal or middle position and the key-lever 43 is depressed, it acts through the levers 44 and 45 to actuate the type-bar 100 connected therewith and the ribbon-throw mechanism without actuating the letter-spacing mechanism, but when the shift-frame is in either of its other positions letter-space movement will be given to the paper-carriage. The type-bar to be actuated by 105 the dead-key lever may carry a type adapted to print an accent or like character that is to be omitted in some instances and printed in other instances, such as the grave, 110 acute or circumflex accents, so that such character may be printed immediately over letters; it being obvious that no spacing movement of the carriage should take place 115 between the printing of the letter and the character when the latter is to be placed immediately over the letter, or in otherwise associated therewith.

It is to be understood that the details of construction illustrated in the accompanying 120 drawings may be considerably varied without departing from the spirit of the invention and I do not wish to be confined to such details except as they are hereinafter made the subject of specific claims. As, for 125 instance, the operating lever 44 may be arranged so that it will operate the escapement-lever in the mid-position of the shift-frame and to be inoperative upon the said escapement-lever in the forward and back- 130

ward positions of the said shift-frame, or, in fact, various combinations of the said operating lever and escapement-lever may be had, whereby the operating lever may be caused to operate the escapement-lever in any desired position of the shift-frame or to be rendered inoperative thereon in any desired position of said shift-frame.

I claim as my invention:—

1. In a typewriting machine, in combination with the shift-frame, the ribbon-throw mechanism, the letter-spacing mechanism and the dead-key lever, means operated by said dead-key lever adapted to give movement to the ribbon-throw mechanism in any position of the shift-frame and to operate the letter-space mechanism in certain positions only of the shift-frame.

2. In a typewriting machine, in combination with the shift-frame, the letter-spacing mechanism and escapement-lever therefor, the ribbon-throw mechanism and connecting rod therefor, and the dead-key lever, means operated by said dead-key lever adapted, in any position of the shift-frame, to act upon said connecting rod and adapted in certain positions only of the shift-frame to act upon said escapement-lever.

3. In a typewriting machine, in combination with the shift-frame, the escapement-mechanism and escapement-lever therefor, the ribbon-throw mechanism and connecting rod, and the dead-key lever, an operating lever actuated by said dead-key lever, said operating lever being adapted to actuate said connecting rod in any position of the shift-frame and to actuate said escapement-lever in certain positions only of said shift-frame.

4. In a typewriting machine, in combination with the shift-frame, the letter-spacing mechanism and escapement-lever therefor, the ribbon-throw mechanism and connecting rod therefor, and the dead-key lever, a vertically swinging operating lever located beneath and adapted to act upwardly on said connecting rod, and a member upon the rising and falling end of said operating lever adapted in certain positions only of the shift-frame to engage said escapement-lever.

5. In a typewriting machine, in combination with the shift-frame, the letter-spacing

mechanism and escapement-lever therefor, the ribbon-throw mechanism and connecting rod therefor, and the dead-key lever, an operating lever actuated by said dead-key lever, said operating lever being located beneath and adapted to act upwardly on said connecting rod, a member upon the rising and falling end of said operating lever spaced laterally from the portion of the operating lever which engages the connecting rod, said member being comprised of two legs with an upwardly opening recess therebetween and a plate secured to said escapement-lever, said plate being provided with a finger which, in one position of the shift-frame, is directly above the recess in said member but which, in the other positions of said shift-frame, is adapted to engage the legs of said member.

6. In a typewriting machine, in combination with the shift frame, the letter-spacing mechanism, the ribbon-throw mechanism and dead-key lever, a type-bar operated by said dead-key lever and provided with a type-head carrying three types, means operated by the said dead-key lever, acting to give movement to the ribbon-throw mechanism in the positions of the shift-frame corresponding with all of said types, and acting to operate the letter-space mechanism in a position of the shift-frame corresponding with a portion only of said types.

7. In a typewriting machine, in combination with the shift-frame, the letter-spacing mechanism, the ribbon-throw mechanism, and dead-key lever, a type-bar operated by said dead-key lever and provided with a type head carrying three types, an operating lever operated by the said dead-key lever acting to give movement to the ribbon-throw mechanism in the positions of the shift-frame corresponding with all of said types, and acting to operate the letter-space mechanism in positions of the shift-frame corresponding with two of said types.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 20th day of May A. D. 1909.

THERON L. KNAPP.

Witnesses:

B. C. Young,

L. L. Schroeder.