No. 662,106. Patented Nov. 20, 1900.

F. J. WICH.

LINOTYPE MACHINE.

(Application filed Apr. 4, 1900.)

(No Model.) 7 Sheets—Sheet 1.

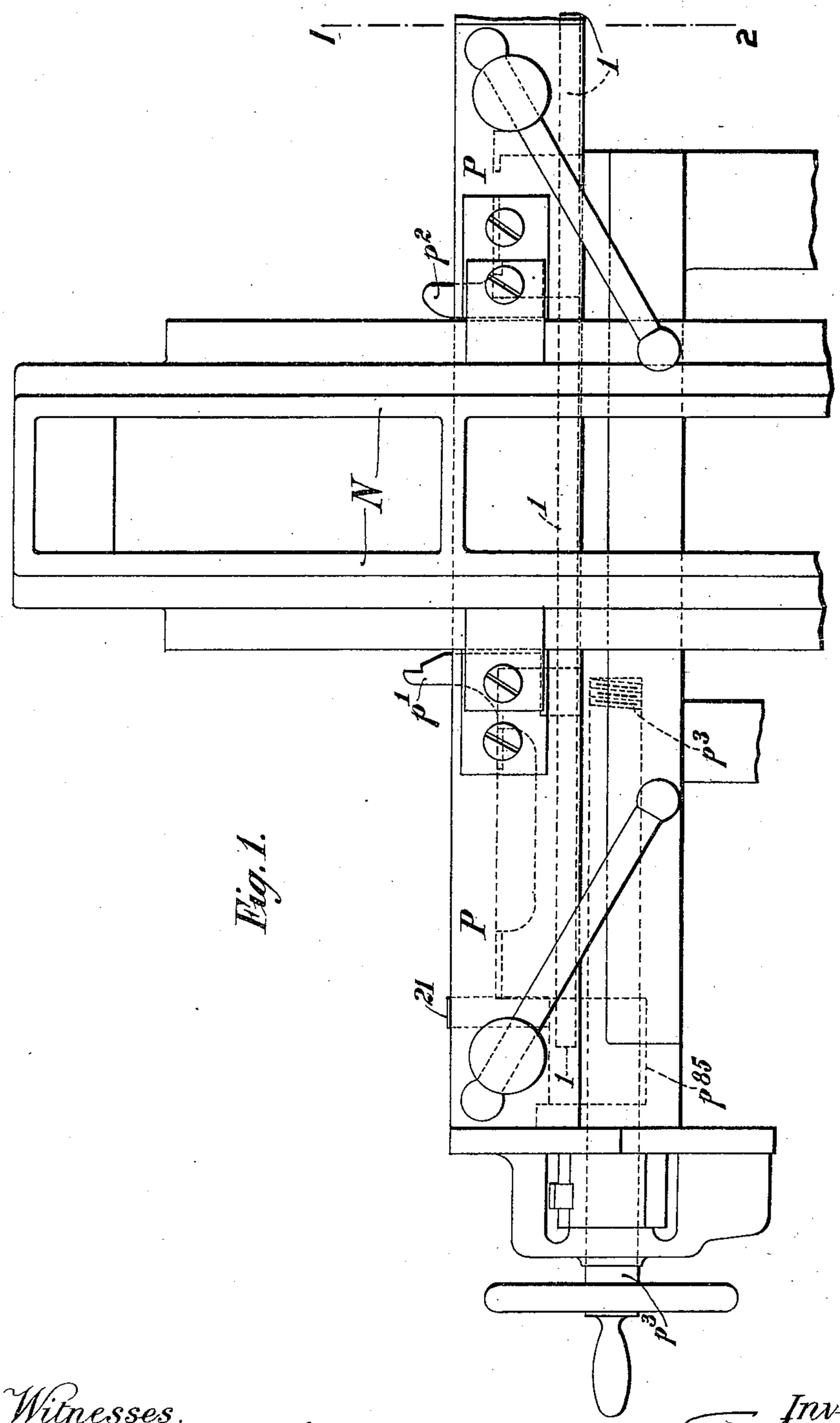

Fig. 1.

Witnesses.
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per Phil. T. Dodge
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No. 662,106. Patented Nov. 20, 1900.

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(Application filed Apr. 4, 1900.)

(No Model.) 7 Sheets—Sheet 2.

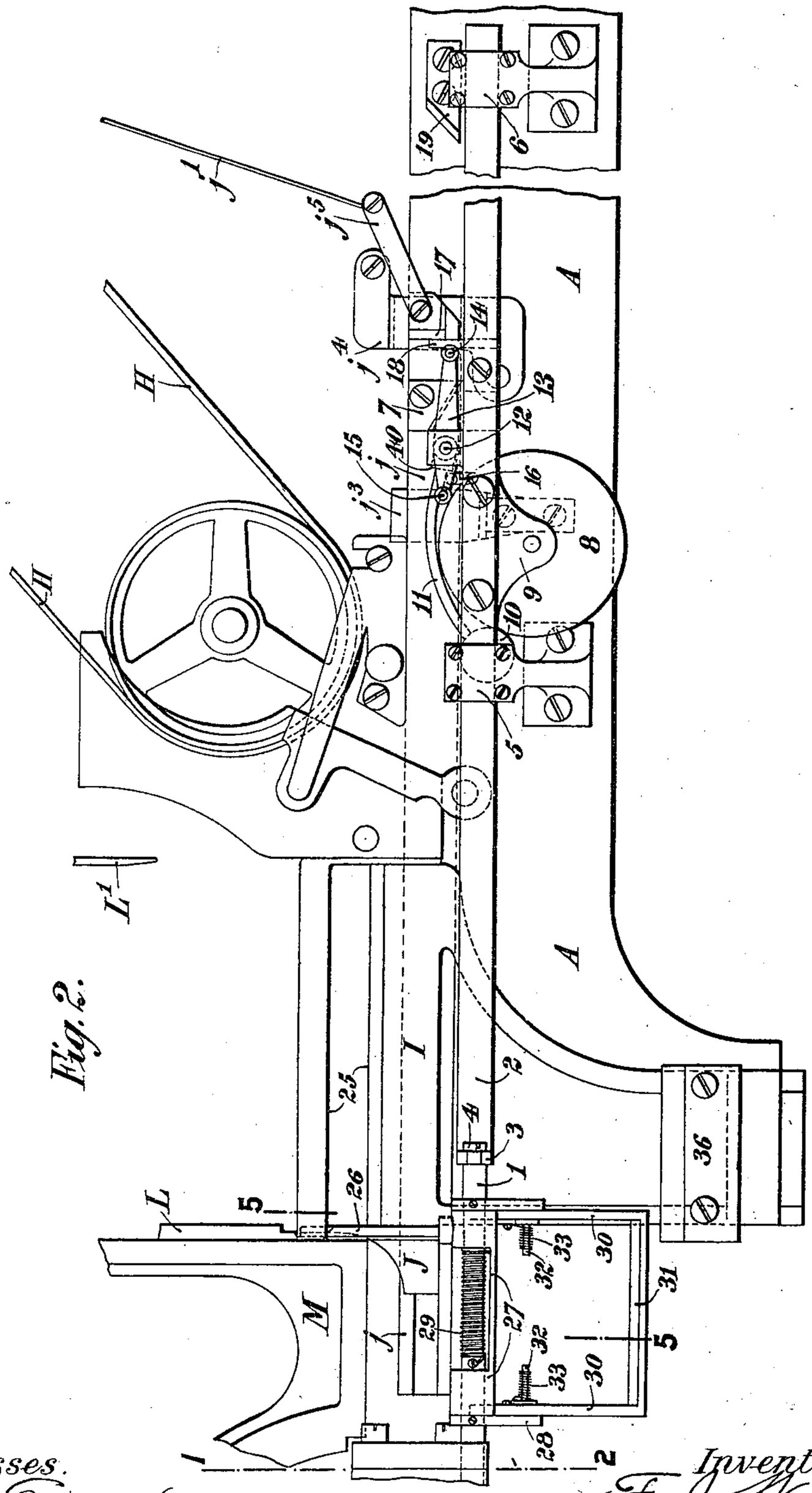

Fig. 2.

Witnesses.
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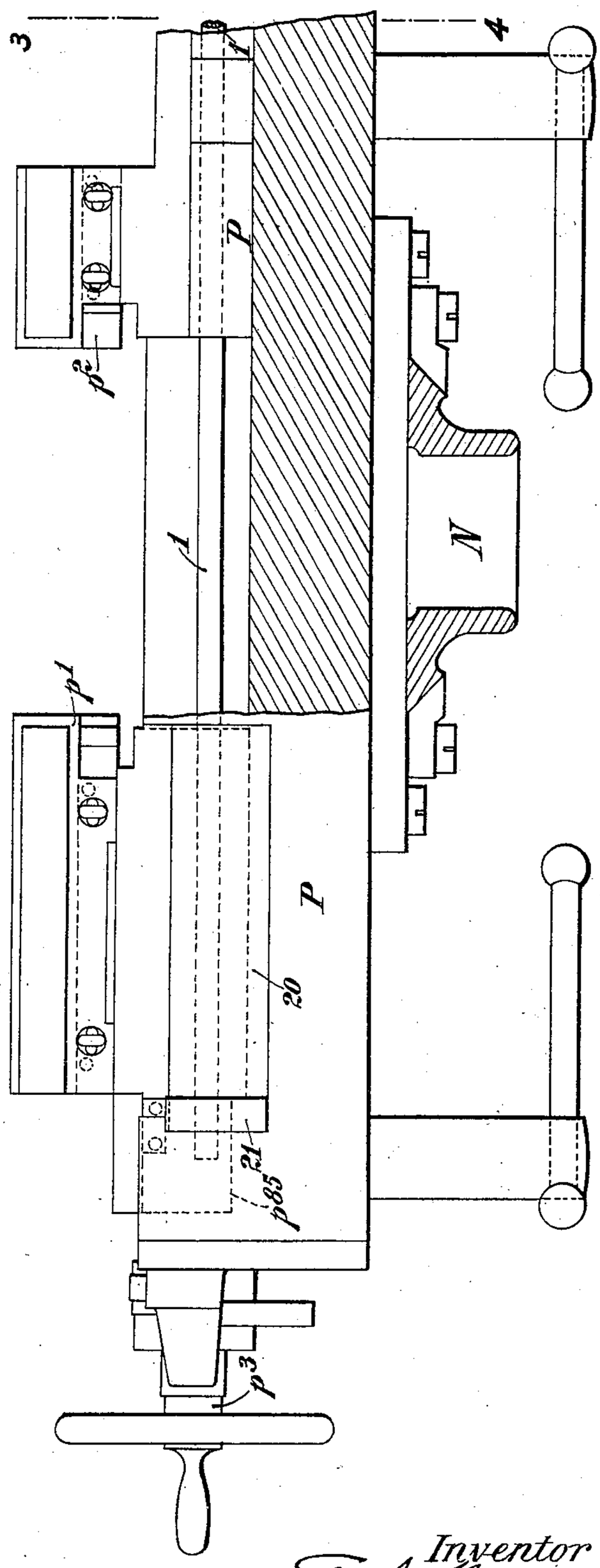
(No Model.) 7 Sheets—Sheet 3.

Fig. 3.



Witnesses.
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A. M. E. Kennedy.

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(No Model.)

7 Sheets—Sheet 4.

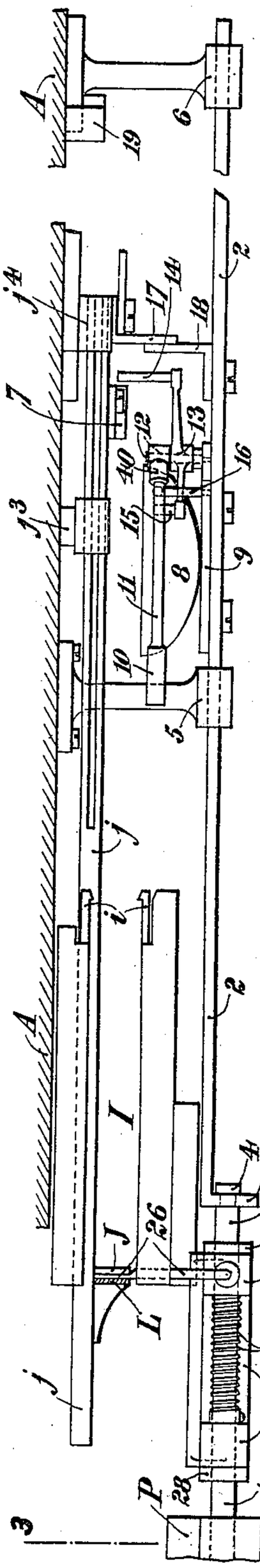

Fig. 4.

Witnesses.
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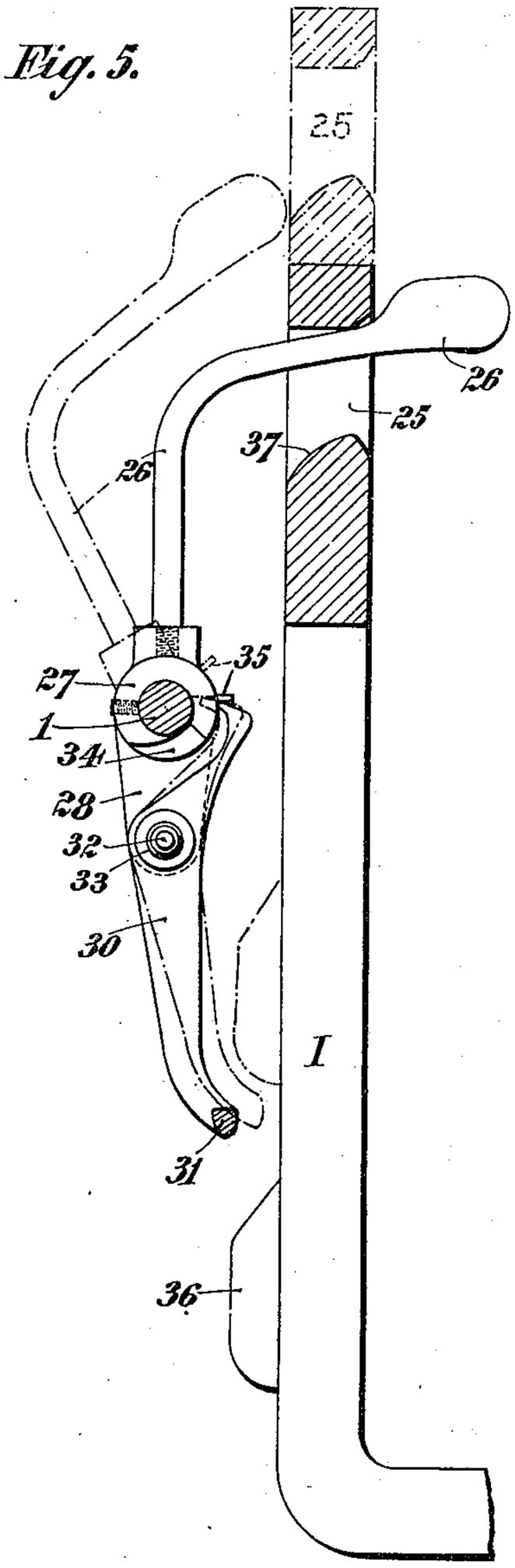
LINOTYPE MACHINE.

(Application filed Apr. 4, 1900.)

(No Model.) 7 Sheets—Sheet 5.

Fig. 5.



Witnesses.
F. L. Elmore.
A. W. E. Kennedy

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No. 662,106. Patented Nov. 20, 1900.

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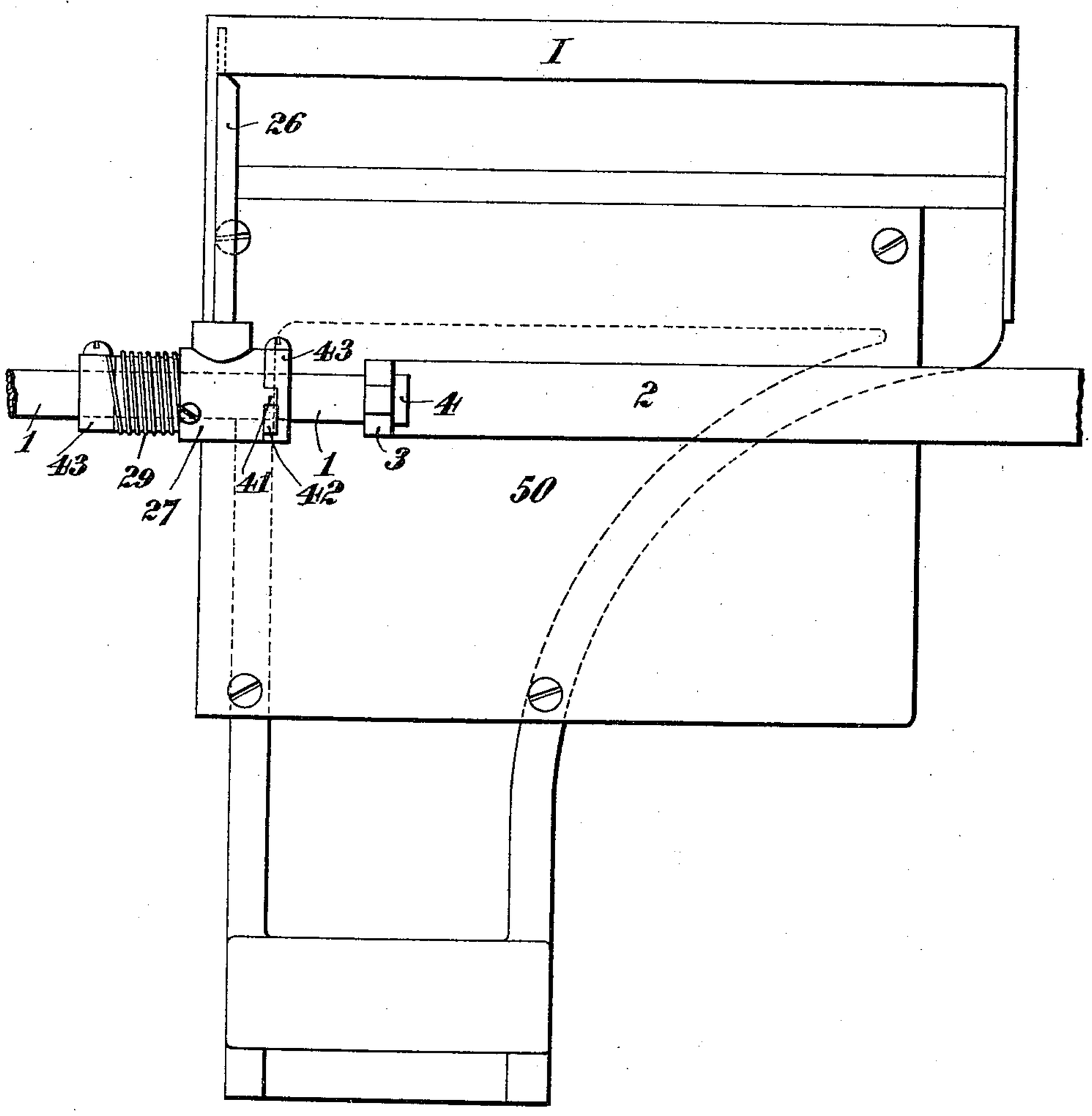
LINOTYPE MACHINE.

(Application filed Apr. 4, 1900.)

(No Model.) 7 Sheets—Sheet 6.

Fig. 6.



Witnesses
F. L. Elmore.
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LINOTYPE MACHINE.

(Application filed Apr. 4, 1900.)

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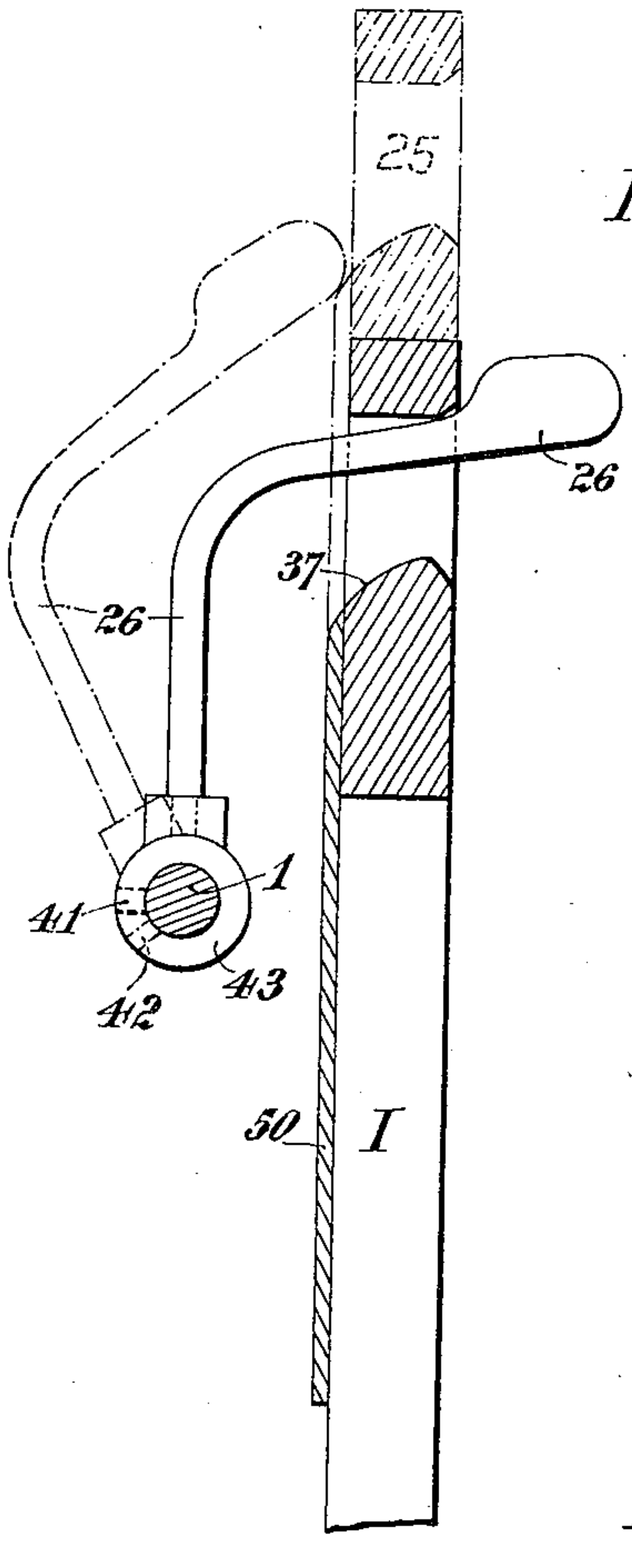

Fig. 8.

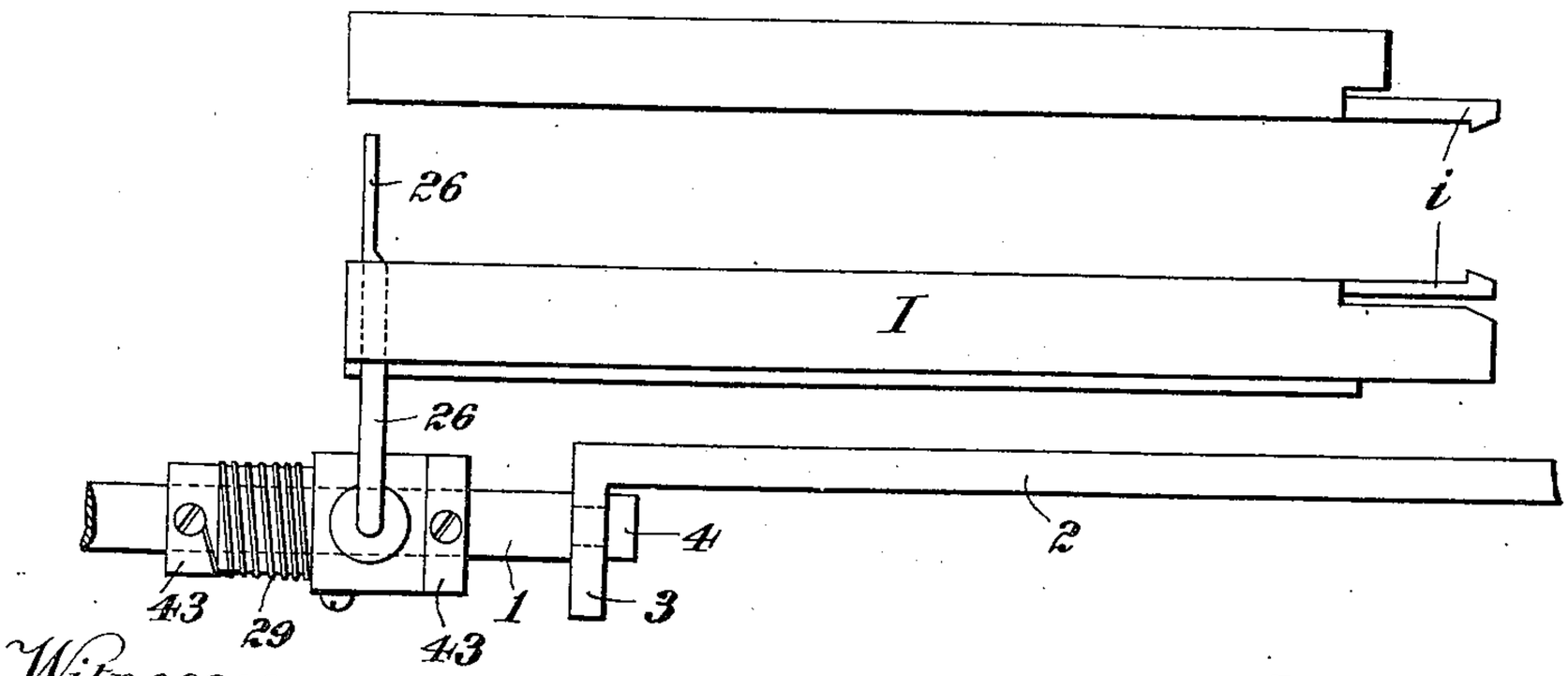

Fig. 7.

Witnesses
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Inventor
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per Thos. T. Lodge
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UNITED STATES PATENT OFFICE.

FERDINAND JOHN WICH, OF BROADHEATH, ENGLAND.

LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 662,106, dated November 20, 1900.

Application filed April 4, 1900. Serial No. 11,526. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND JOHN WICH, of Broadheath, in the county of Chester, England, have invented certain new and useful Improvements in Linotype-Machines; and I do hereby 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.

This invention relates to improvements in the Mergenthaler linotype-machine, such as shown in United States Letters Patent No. 436,532. In this machine there are two matrix-confining jaws, one of which is movable in relation to the other to effect a change in the length of the line produced.

The object of the present invention is to make the adjustment of the jaw effect automatically the corresponding adjustment of a warning-bell and of a certain finger which assists in the transfer of the matrices, thus avoiding the present necessity for independent adjustment of these parts and insuring their proper adjustment in relation to each other.

The present drawings are limited to such parts of the original machine as are necessary to an understanding of my invention, and to facilitate the identification of corresponding parts in the present structure with those in the patent referred to I have indicated the parts shown in the patent by the same characters in the present drawings.

Figure 1 is a front elevation of the tops of the vise frame and yoke. Fig. 2 is a front elevation of the assembler and shifter. These two figures include the full width of the machine, continuing each other at the respective vertical dot and dash lines 1 2. Figs. 3 and 4 are plans, partly in section, generally corresponding, respectively, with Figs. 1 and 2 and continuing each other at the respective dot and dash lines 3 4. Fig. 5 is an enlarged vertical section on the line 5 5 of Fig. 2. Figs. 6, 7, and 8 are respectively detail front elevation, plan, and sectional side elevation, all on an enlarged scale, of a modified form of the improvement illustrated in Fig. 5.

In the Mergenthaler linotype-machine the matrices drop vertically from their magazine onto an inclined belt H. This belt travels at a high speed from right to left and delivers the matrices one by one into the assembler-box I. This assembler-box consists of two parallel and horizontal side plates held together (see Fig. 4) and is as a whole capable of vertical motion up and down between suitable guides. The matrices enter the right-hand end of the box, each traveling vertically past non-return spring-detents *i*, as shown in Fig. 4. As the first matrix clears the detents *i* it meets a yielding resistant J. This is a finger fast on the end of the assembler-bar *j*, and as the latter is mounted in horizontal guides j^3 j^4 in the main frame A of the machine the resistant J is capable of a horizontal motion through the assembler-box I. The increasing length of the line of matrices in the latter pushes the resistant J before it toward the left against the pull of a returning-spring j', acting on the assembler-bar through the link j^5. A gong worked from the assembler-bar *j* is sounded to warn the operator when nearly all the matrices for the line are in the assembly-box I, so that he will stop composing in time. The resistant J finds itself pushed over to the left, as shown in Fig. 4, by the time all the matrices for the line are assembled, the final position of the resistant depending on the length of the line composed.

At a short distance above the assembler-box I there is the shifter. This consists of a pair of fingers L L′ depending, as usual, from two horizontal slides. The finger L, urged to the right by a spring, as usual, stands normally at a distance from the finger L′ a little less than the length of the line to be composed, its position in the commercial machine being determined by an adjustable stop, which is separately moved when the length of line is to be changed. As the composition of the line of matrices in the assembler approaches a finish the resistant J encounters the finger L and the two move back together to the left, standing in the same vertical plane at the left end of the line of matrices.

When nearly all the matrices for the line are in the assembler-box I, the assembler sounds the gong. As soon as they are all in the assembler-box I is raised between its guides till it puts its line between the shifter-fingers L L′. These move it horizontally to

the left through the guide-block M, deliver it into the top of the yoke or transporter N, and are returned into their normal position above described. The transporter N then moves down till it presents the line of matrices between two vise-jaws p' p^2. The jaw p^2 is fixed to the vise-frame P, while the jaw p' is adjustable to and from it in a suitable guide in the vise-frame P. The adjusting device consists of a backing-up nut p^{85}, traversed by the vise-screw p^3, controlled by a hand-wheel, as shown in Figs. 1 and 3.

Up to the present time three adjustments have been necessary, viz: First, that of the relation between the assembler-bar *j* and its gong to make the said bar sound its gong at the right moment; second, that of the left-hand shifter-finger L to make it stop on its return journey at approximately the length of the line from its fellow-finger L′, and, third, to adjust the position of the backing-up nut p^{85}, so that when the line of matrices is being justified between the vise-jaws the nut p^{85} shall keep the vise-jaw p' held at the proper distance from its fellow, so that the linotypes shall be exact to length, and all these adjustments have been independent of each other—that is, each one has presented a chance of error on its own account.

The object of the present invention—the effecting of the three adjustments as one—is attained by the following means.

Referring to Figs. 1 to 5 the face of the vise-block P carries a scale of ems 20, fixed in such a position as to be readily read by the operator, and 21 is an index-piece carried by the vise-nut p^{85} and indicating by its reading on the scale 20 the distance of the jaw p' from the jaw p^2.

1 is a rod fast by one end to the nut p^{85} and extending to the right through the vise-frame P out of the way of the adjacent moving parts as far as the front of the assembler-box I, where it connects with a second rod 2. These two rods are for the purpose of the invention one and continuous; but as the vise-frame P must often be swung down to give access to the casting mechanism behind it a suitable automatic disconnecting and reconnecting device is interposed at the junction of the two rods. This device consists of a fork 3, projecting to the front from the end of the rod 2, having its prongs at a distance apart less than the diameter of the rod 1, which is there shouldered down to pass in and out of the fork 3, and an enlargement 4 on the end of the rod 1 to prevent the two drawing away from each other in the direction of their length. The rod 2 is carried by brackets 5 6 on the machine-frame A and through which it can slide freely to and fro in the direction of its length.

7 is the gong-dog on the assembler-bar *j*; but it is not adjustable thereon.

8 is the gong fixed to a plate 9, made fast to the rod 2.

10 is the hammer on the end of a flexible stem 11, the opposite end of the latter being fast in a socket 40, capable of turning on a pin 12, fast to the plate 9.

13 is a lever pivoted on the pin 12, holding one arm, 14, in the path of the dog 7 and a second one, 15, under the stem 11.

16 is a pin fast to plate 9 and serving to stop the stem 11 when it drops.

17 is a bracket on the right-hand end of the assembler-bar *j*, and 18 is a similar one on the corresponding end of the rod 2, the bracket 18 thereby serving as a stop for the forward motion of the resistant J.

19 is the stop for the return motion of the latter, both stops getting at the resistant J through the assembler-bar *j*.

25 is a horizontal slot in the front plate of the assembler-box I, having in vertical section the peculiar form shown in Fig. 5. This is shown clearly in Fig. 5.

26 is a stop for the finger L in the form of a backwardly-bent arm pivoted upon the rod 1 by being made fast to a socket 27, from which it projects upward. The stop 26 takes the place of the adjustable stop heretofore employed for limiting the approach of finger L toward finger L′. The socket 27 is held in the desired position on the rod 1, but so as to rock thereon by a block 28 on each side of it and adjustable lengthwise on the said rod.

29 is a spiral spring surrounding the rod 1 within the socket 27 (which is suitably cut away to receive it) and is kept in torsional stress by having one end made fast to the rod 1 and the other to the socket 27 in order that it may project the nose of the arm 26 through the slot 25 when they register with each other in a vertical sense, as shown in Fig. 5. The object of the adjustability of the socket 27 along the rod 1 is to make the arm 26 rock between the shifter-arm L and the resistant J, as shown in Figs. 2 and 4.

30 30 is a duplex catch having its arms connected by a transverse bar 31. It is pivoted on pins 32, projecting toward each other from the two arms 28. Each pin 32 carries a spiral spring 33, the ends of which are made fast to the said pin and the respective arm 30, so as to be in torsional stress thereon for the purpose of rocking the operative noses of the duplex catch 30 30 into a notch 34 in the socket 27, as illustrated in Figs. 2 and 5.

35 is a stop-pin projecting rearwardly from the socket 27 to rest upon one of the noses of the duplex catch 30 30 to prevent the spring 29 forcing the arm 26 too far to the rear.

36 is a plate fast upon the lower part of the assembler-box I and projecting to the front therefrom. The function of this plate is to rock the catch 30 out of the notch 34. For that reason it must occupy such a position upon the said box I that enough of it is vertically below the transverse bar 31 to engage it when the assembler-box I is raised.

Figs. 1 to 5 show the vise open to receive a line of matrices, the rod 1 2 and the parts controlled by it in the respectively correspond-

ing positions, the assembler-bar being at the end of its working stroke—*i. e.*, just before the assembler-box I rises. The action of the invention is as follows: To make it easier to follow, it is assumed that after the line of matrices described as having entered the assembler-box I has been cast from, the machine will start upon a different length of linotype. The assembler-bar *j* will have been returned to the stop 19 by its returning-spring *j'*. The fresh length of linotype being known, the position of the jaw *p'* is adjusted accordingly by the screw p^3, the nut p^{85}, the scale 20, and the index 21. The motion of the nut p^{85} is communicated through the rod 1 2 to the bracket 18 and to the arm or gong-trigger 14. Consequently the moment when the gong is sounded the length of the working stroke of the resistant J is adjusted to suit the new length of line, because the bracket 18 is in the path of the bracket 17. Just before the latter comes up to the former the dog 7 forces the pin 14 down, thereby raising the hammer 10. As soon as the dog 7 has passed the pin 14 the flexible stem 11 drops upon the pin 16 and, being flexible, lets the hammer 10 strike the bell 8 and then lifts it again. The dog 7 is so shaped that it will not ring the bell 8 during the return motion of the assembler-bar *j*.

The same motion of the rod 1 2 that adjusts the bracket 18 and the trigger 14 in the way above described puts the arm 26 in the plane immediately to the left of the outward position of the resistant J, and therefore in the one best adapted to prevent the finger L exerting any pressure thereupon. The said arm 26 is held between the shifter-finger L and the resistant J by the spring 29 forcing the nose of it through the slot 25 into the assembler-box I until the stop 35 rests upon one nose of the duplex catch 30 30, as shown in Fig. 5. The arm 26 must be disengaged from the assembler-box I before the latter has gone through half its upward motion, and this disengagement is effected by the suitably-shaped edge of the notch 25. As soon as the arm 26 is in the disengaged position (the one shown by the dotted lines in Fig. 5) the catch 30 30 is rocked into the notch 24 in the socket 27 by their springs 33, thereby locking the arm 26 in that position.

The modification illustrated in Figs. 6, 7, and 8 relates principally to the means for locking the arm 26 outside the assembler-box I. This means consists of a vertical surface 50, up to which the said arm is kept by the spring 29. The forward motion of the arm is limited by a stop 41, working in an arcual slot 42 in the adjacent collar 43 instead of by the stop 35. Two collars 43, substitute the depending arms 28, while the duplex catch 30 30, its pivots and springs, and its actuating-plate 36 are dispensed with.

I claim—

1. The hereinbefore-described combination with the vise, assembler-gong, and line-shifter of a linotype-machine, of means by which the adjustment of the vise for length of linotype automatically adjusts the said gong and shifter for the same length.

2. The combination in a linotype-machine, of the backing-up nut of the adjustable vise-jaw; gong mechanism; a connection between the said vise-jaw and gong mechanism; assembler-bar dog to actuate the gong; arm pivoted on the said bar to hold back the shifter-finger and connection between the said arm and the assembler-box to actuate the said arm.

3. The combination in a linotype-machine of the adjustable vise-jaw; gong mechanism; rod connecting the said vise-jaw and gong mechanism; assembler-dog to actuate the gong; stop on the rod to stop the assembler-bar; arm pivoted on the said bar to hold back the shifter-finger; and connection between the said arm and the assembler-box to actuate the said arm.

4. The hereinbefore-described combination with the line-shifter of a linotype-machine, of arm adapted to be rocked into the assembler-box to adjust the shifter-arm and to be disengaged therefrom by the assembler-box.

5. The hereinbefore-described combination with the adjustable jaw of the vise of a linotype-machine, of gong mechanism; rod connecting the two; assembler-bar; and dog thereon to actuate the gong.

6. The hereinbefore-described combination with the adjustable jaw of the vise of a linotype-machine, of gong mechanism; rod connecting the two; assembler-bar; dog thereon to actuate the gong, and stop on the rod to stop the assembler-bar.

7. In a linotype-machine, an adjustable matrix-confining jaw and alarm mechanism connected with the jaw and adjusted thereby as to the time of its action, whereby the alarm is automatically set to correspond with various lengths of line to which the jaws are adjusted.

8. In a linotype-machine, the combination of a matrix-composing mechanism, a jaw adjustable to confine matrix-lines of different lengths, an alarm mechanism actuated by the assembling devices to indicate the length of line, and a connection from the adjustable jaw, controlling the operative position of the alarm, whereby the adjustment of the jaw to effect a variation in the length of line effects a corresponding adjustment of the alarm.

9. In a linotype-machine, the combination of an adjustable matrix-confining jaw, an adjustable shifter-finger, an alarm actuated by the assembling mechanism, and a connection whereby the opening of the jaw is caused to effect a corresponding adjustment of the shifter-finger and the alarm-sounding devices.

10. In a linotype-machine, in combination with an adjustable matrix-confining jaw, an adjustable finger to aid in shifting the com-

posed line of matrices, and a connection from said jaw to control the normal position of said finger, whereby the adjustment of the jaw to change the length of line is caused to effect the corresponding adjustment of the finger.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

FERDINAND JOHN WICH.

Witnesses:
JOHN H. JOY,
JOSEPH BARRATT.