No. 638,868. Patented Dec. 12, 1899.

E. GIROD.

MECHANISM FOR MOVING MOLDS OF LINOTYPE MACHINES.

(Application filed Oct. 12, 1899.)

(No Model.) 4 Sheets—Sheet 1.

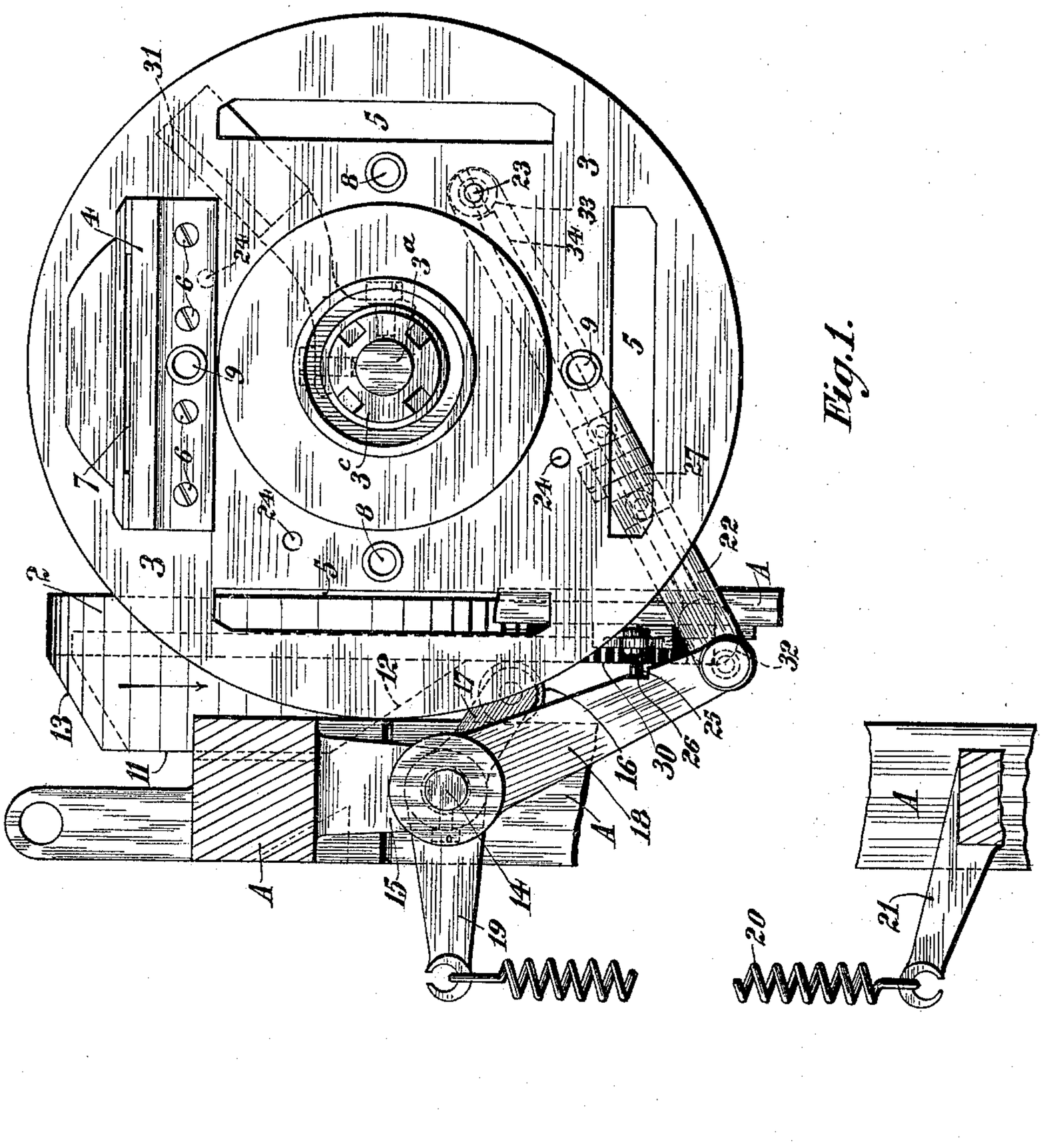

Fig. 1.

WITNESSES.
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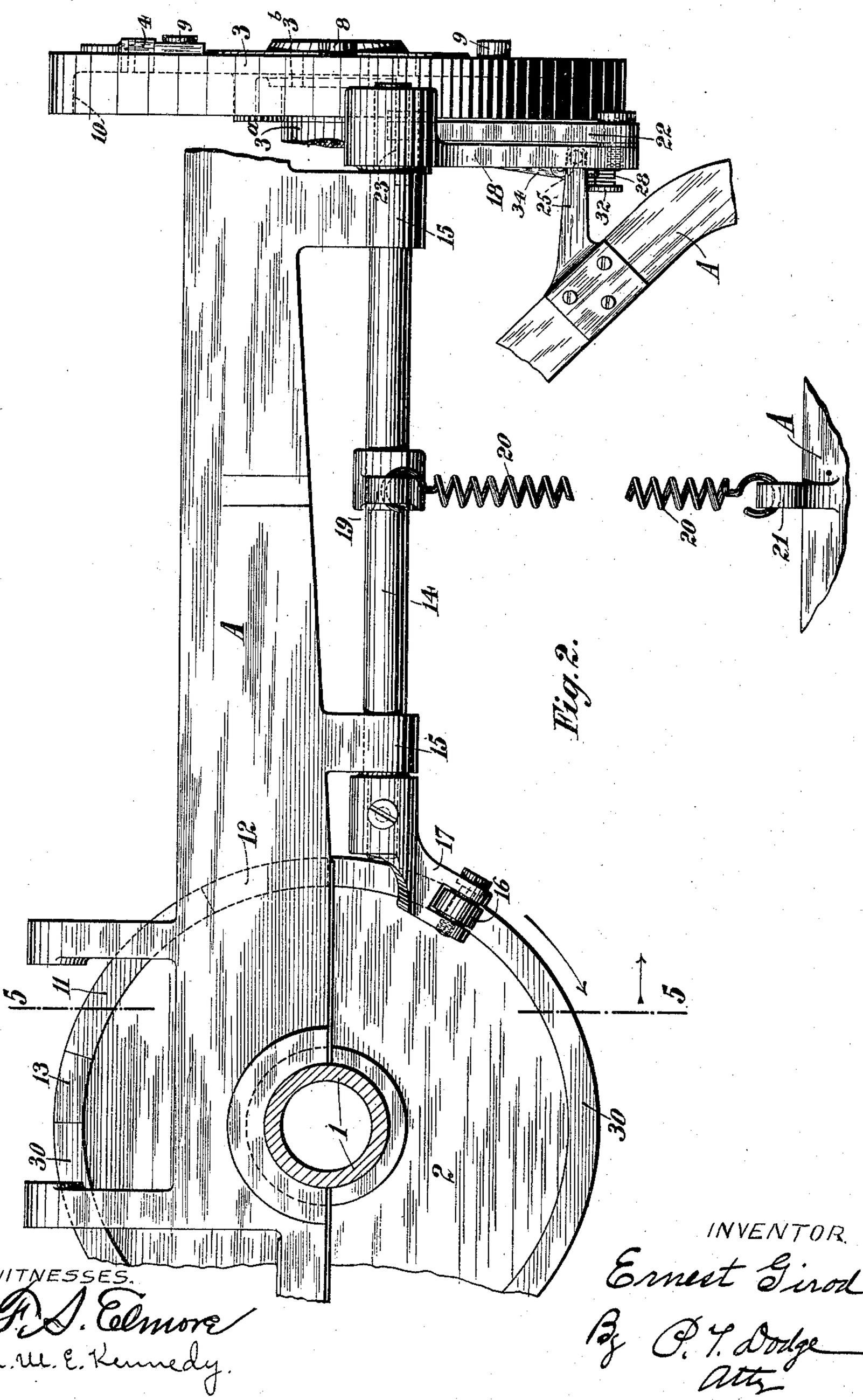

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

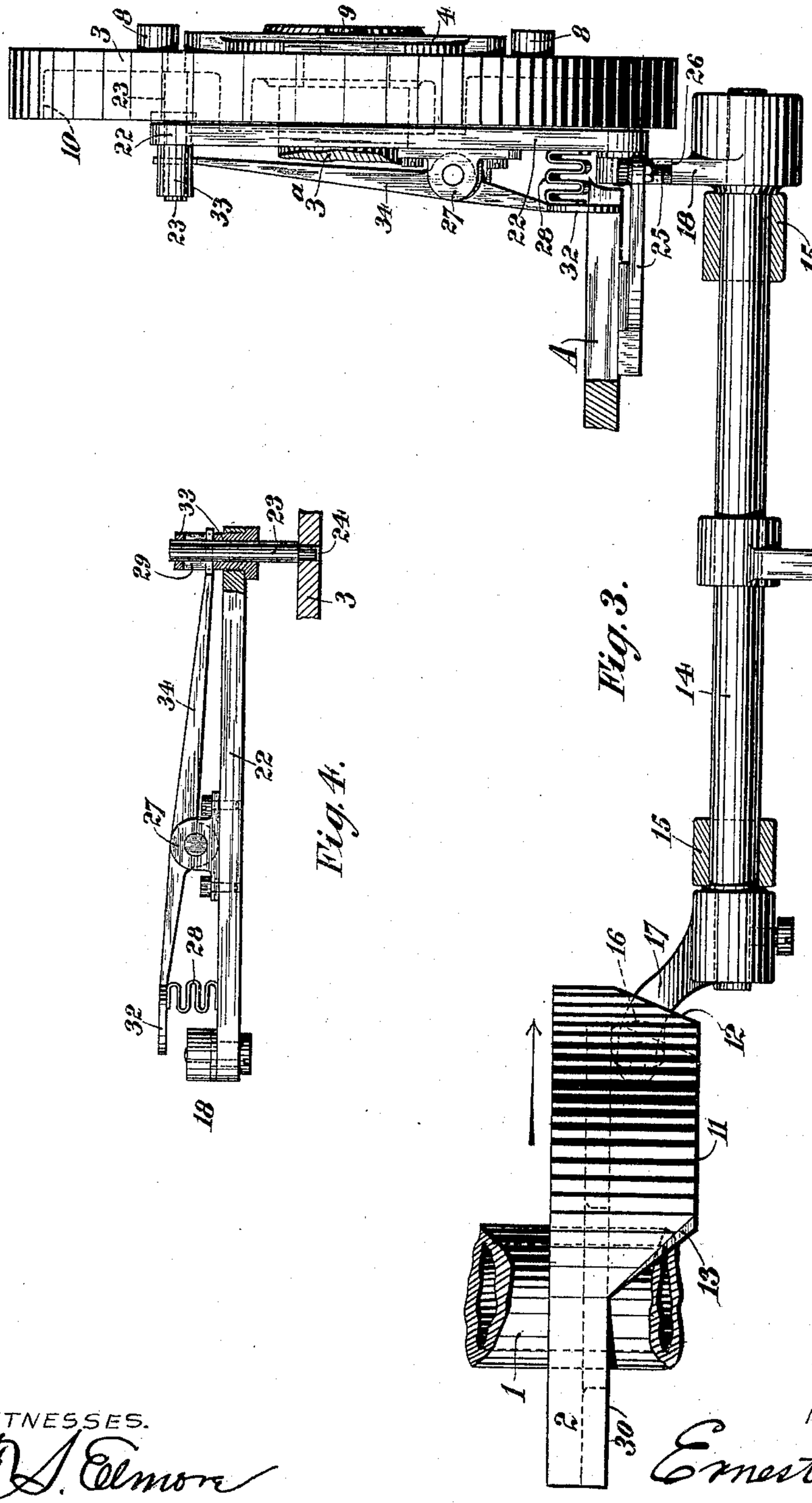

Fig. 3.

Fig. 4.

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MECHANISM FOR MOVING MOLDS OF LINOTYPE MACHINES.

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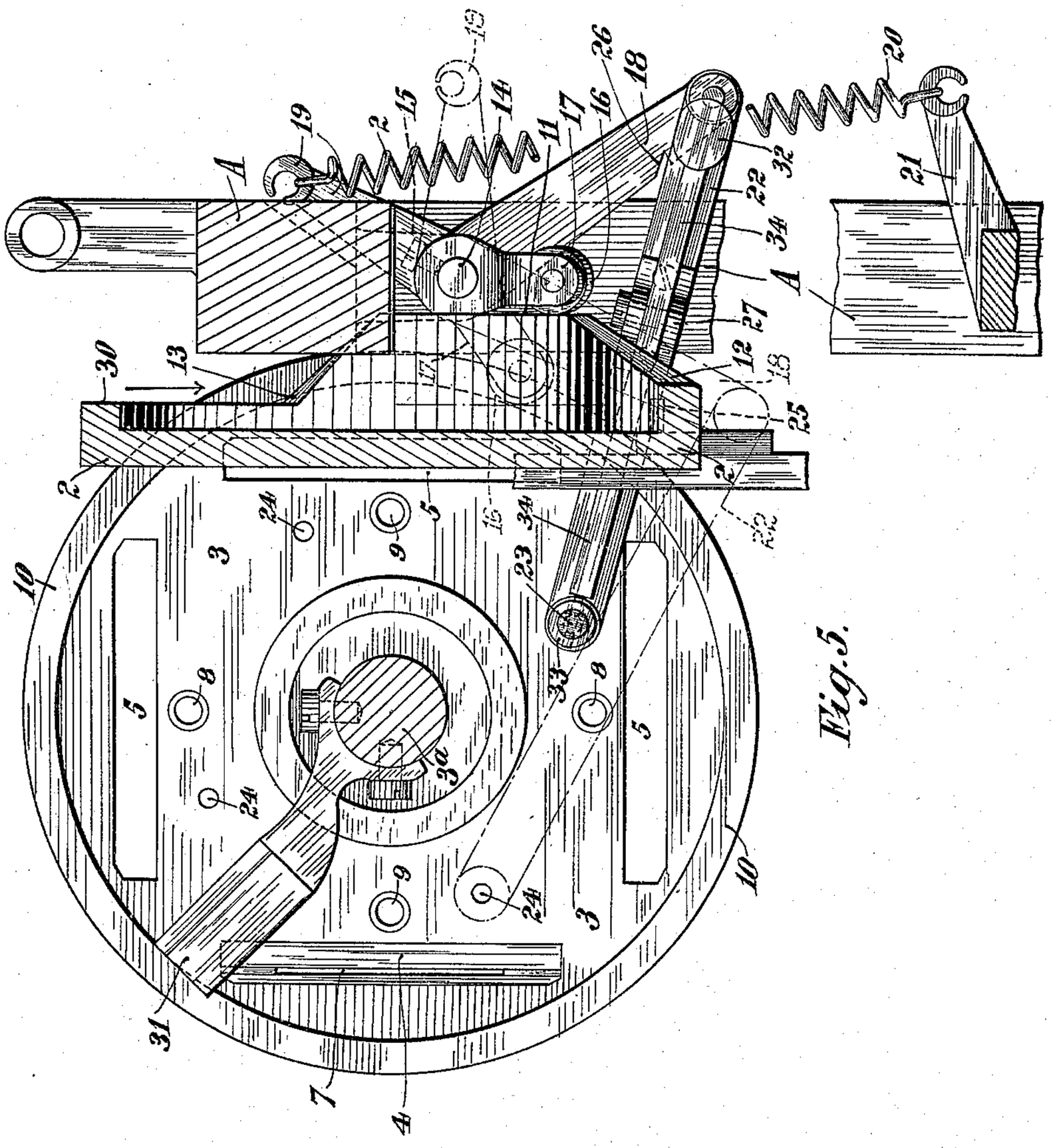

Fig. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

ERNEST GIROD, OF MILAN, ITALY, ASSIGNOR TO THE MERGENTHALER LINOTYPE COMPANY, OF NEW YORK, N. Y.

MECHANISM FOR MOVING MOLDS OF LINOTYPE-MACHINES.

SPECIFICATION forming part of Letters Patent No. 638,868, dated December 12, 1899.

Application filed October 12, 1899. Serial No. 733,405. (No model.)

To all whom it may concern:

Be it known that I, ERNEST GIROD, residing at Milan, in the Kingdom of Italy, have invented certain new and useful Improvements in Mechanism for Moving Molds of 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.

The present invention relates to improvements in the mechanism that moves the molds of linotype-machines. The mold in which a linotype-machine casts a linotype is a slot, the width of which extends through a mold-block. The latter is fixed on or to a carrier which holds the mold in one position while the linotype is being cast and in a second one while the same linotype is being ejected. After ejection has been effected the carrier returns the mold into the casting position.

The motion of the mold-carrier may be either circular or linear and either reciprocating or more or less continuous. It is highly desirable in view of a quick change in the working of the machine from one size of linotype to another that the carrier shall carry several mold-blocks of different sizes in order that changing the mold—*i. e.*, putting one out of working position and another one in—may be effected as quickly as possible.

The most convenient form of carrier hitherto used is the mold-wheel of the Mergenthaler linotype-machine described in the specification of Letters Patent No. 436,532, granted September 16, 1890. As at present constructed that carrier is adapted to carry four mold-blocks symmetrically arranged on one side of it, each one having the length of its slot parallel with a chord of the respective arc of that wheel. The latter is mounted on a stud-axle, about which it is driven by a spur-pinion en, gaging with spur-gearing on the periphery of the said wheel, and it makes one complete revolution for each linotype cast. Such revolution is, however, made up of two intermittent motions following each other. One of them is through an arc of ninety degrees, while the other is through one of two hundred and seventy degrees. The shorter arc is from opposite the ejector when the mold is vertical on the right-hand side of the axis of the mold-wheel into the position opposite the composed line of matrices, in which the mold is horizontal above the said axis. The longer arc is from the latter to the former positions. Changing the mold of a Mergenthaler linotype-machine consists in freeing the mold-wheel from its axle, turning it through an arc of either ninety or one hundred and eighty degrees, according to the then position of the mold to be put into work, and making the wheel fast to its axle again.

According to the present invention the above-mentioned spur-pinion and the gearing on the periphery of the mold-wheel, as well as the means for driving the said spur-pinion, are all dispensed with and the two intermittent and following arcual motions of ninety and two hundred and seventy degrees, respectively, are replaced by an intermittent and reciprocating one through an arc of ninety degrees between the casting and the ejecting positions. To that end there is combined with the mold-carrier, now become a disk as compared with a spur-wheel, suitable mechanism for moving it accordingly, as well as mechanism for keeping it in contact with the disk as the latter advances to and retires from the composed line of matrices and also from the ejecting-port and for allowing the disk to be moved about its axle for changing the mold.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is a sectional front elevation showing the mold on the disk standing opposite the composed line of matrices. Fig. 2 is a side elevation from the left side of the machine. Fig. 3 is a plan corresponding with Figs. 1 and 2. Fig. 4 is a detail plan of the connections to the disk; and Fig. 5 is a sectional rear elevation showing by the full lines the mold of Figs. 1, 2, and 3 opposite the ejector.

A A are parts of the machine-frame.

1 is the usual cam-shaft of the Mergenthaler linotype-machine, turning in suitable bearings in the machine-frame through one complete revolution for each linotype cast, as here-

tofore. 2 is a cam-disk fast upon it. The direction in which this cam-disk is rotated is shown by the arrows in Figs. 1, 2, 3, and 5.

3 is the disk or mold-carrier. It is mounted upon a fixed stud-axle 3^a, about which it can turn freely, being held thereupon between a shoulder 3^b and a nut 3^c, as shown. 4 is one of the four mold-blocks which it carries. As only one mold is in use at once, only one mold-block is included in the figures to prevent confusion. The symmetrical positions of all the four blocks are shown by the respective cavities 5 in Figs. 1 and 5. Each mold-block fits its respective cavity 5, as shown in Figs. 2 and 5, and up to the front face of the disk 3, being held thereto by screws 6, as shown in Fig. 1.

8 8 9 9 are two pairs of sockets to engage in turn, according to which of the four mold-blocks 4 is in work, with a pair of steadying-pins projecting from the vise-frame.

10 is a rearwardly-projecting flange on the disk 3 and flush with its periphery. The molds 7, mold-blocks 4, cavities 5, screws 6, sockets 8 and 9, steadying-pins, flange 10, and vise-frame are the same as heretofore.

The mechanism for moving the disk 3 through its intermittent reciprocating arcual motion of ninety degrees is as follows:

11 is a cam on the left-hand side of the cam-disk 2 and having the incline 12 and the decline 13.

14 is a rock-shaft turning in bearings 15 15, carried by the frame A, and carrying an anti-friction-roller 16, pivoted in an arm 17, fast on it, to engage with the adjacent side 30 of the cam-disk 2 and the cam 11. The shaft 14 is to the left hand of the disk 3, as shown in Figs. 1, 2, 3, and 5. 18 is an arm fast to the front end of it and projecting therefrom in a downward direction. 19 is a second arm likewise fast to the said shaft 14 and projecting from it, the two arms 18 19 constituting a bell-crank lever fast on the said shaft 14.

20 is an extended spiral spring from the outer end of the arm 19 to the end of an arm 21, fast to the frame A.

22 is a link pivoted by one end to the outer end of the arm 18 and carrying a pin 23, capable of moving freely to and fro through its opposite end in a line parallel with the axis of the disk 3 to engage in one of four holes 24 in the latter. The particular hole in which it engages is beneath the axis of the disk 3 and between it and the ejecting position of the mold 7.

25 is a stop fast on the frame A, and 26 is a notch in the adjacent side of the arm 18. The notch 26 engages with the said stop 25 when the mold 7 has been moved from opposite the ejector to opposite the composed line of matrices to prevent the spring 20 moving it any farther.

If the disk 3 had only to reciprocate through the angle of ninety degrees above mentioned and it were never necessary to change the mold 7 for one of the others on the disk 3, the pin 23 might be fast in the end of the link 22; but the said disk must move forward till it presses the front face of the mold-block 4 metal-tight against the rear face of the composed line of matrices just before the linotype is cast and move back again immediately afterward and forward again after it has been brought opposite the ejector up to the ejecting-port and back again. Neither the composed line of matrices, the coöperation of the mold therewith, the ejector, nor the ejecting-port are included in the drawings, because they do not form any part of the present invention, but are as heretofore. The disk 3 must also be capable of being moved about its axle 3^a to effect a change of mold. To meet these two requirements, the said pin 23 has a sliding motion in a socket 33, fast in the end of the link 22, 34 being a lever pivoted in a bracket 27, projecting from the rear face of the link 22, having one end connected to the pin 23 and the opposite end held away rearwardly from the link 22 by an interposed spring 28.

29 is a slot in the socket 33 for the respective end of the lever 34 to work in.

The action of the invention is as follows: The normal position of the mold 7 is the one illustrated in Fig. 1. The disk 3 is moved forward for a short distance to make the front face of the mold-block 4 contact metal-tight with the composed line of matrices. As it does so the spring 28 keeps the pin 23 engaged in the particular hole 24 in the said disk, as indicated in the detail, Fig. 4. During the act of casting the linotype the roller 16 is held by the spring 20 against the inoperative or low surface 30 of the cam-disk 2. As soon as the casting has been effected the disk 3 moves back from the composed line. The incline 12 then engages the roller 16, and, rocking the shaft 14 and the bell-crank 18 19 with it against the pull of the spring 20, makes the link 22 pull the disk 3 through an arc of ninety degrees, thereby putting the mold 7 opposite the ejector, as illustrated by the full lines in Fig. 5, whereupon the disk 3 is moved forward till the mold 7 is up to the ejecting-port. The mold is held there for the necessary time by the cam 11. This passes the roller 16 when the ejection of the newly-cast linotype has been effected. The disk 3 is then moved back. The further rotation of the cam-disk 2 presents the incline 13 to the roller 16, whereupon the spring 20 pulls it down that incline to the face 30, thereby returning the mold 7 back through the said angle of ninety degrees into the normal position.

31 is the knife for trimming the foot of the linotype. Such a one has always been used; but the present invention requires that it be fixed to the axle 3^a of the disk 3, so as to present its cutting edge in the path of the linotype-foot as the disk 3 moves from the casting into the ejecting position, as is illustrated in Figs. 1 and 5.

The advantage of the present invention is

that the length of the face 30 being greater than the combined arcual length of the incline 12, the cam-projection 11, and the incline 13, the disk 3 and also the metal-pot stand in the casting position for a correspondingly longer time than heretofore, thereby giving the newly-cast linotype additional time for cooling, especially along its foot, and the adjustable disk type of carrier provides for any one of the other three molds being changed for the one in work. This change is effected by loosening the nut 3^c, disengaging the pin 23 from its hole 24 by pressing the thumb-bit 32 of the lever 34 toward the link 22, turning the disk 3 upon its axle 3^a until the required mold is in the position shown in Fig. 1, when the respective hole 24 will be standing opposite the pin 23, releasing the lever 24, whereupon the pin 23 will engage in the said respective hole 24 and tighten up the nut 3^c again.

The present invention confers the longer time for cooling the newly-cast linotype, even when there is only one mold-block 4 on the mold-disk 3.

I claim—

1. The combination of mold-disk capable of reciprocating through an angle of ninety degrees; mold carried thereby; cam-plate rotating in a plane at right angles with that of the mold-disk; link pivotally connected by one end to the mold-disk at a point under the casting position of the mold, and between the axle of the latter and the ejecting position of the said mold; cam-disk rotating in a plane at right angles with that of the mold-disk; a rock-shaft; bell-crank lever fast on the said shaft, and to the outer end of one arm of which the opposite end of the said link is connected; arm on the said shaft to be engaged by the cam-plate and its cam; spring pulling from a fixed point upon the other arm of the bell-crank lever to keep the said arm on the shaft in contact with the cam-disk, and the mold opposite the composed line of matrices; and cam on the cam-disk to engage with the said arm on the way-shaft to rock the latter to make it pull the mold opposite the ejector.

2. The combination of mold-disk capable of reciprocating through an angle of ninety degrees, molds carried symmetrically thereupon; cam-plate rotating in a plane at right angles with that of the mold-disk; link pivotally connected by one end to the mold-disk at a point under the casting position of the mold in work and between the axis of the disk and the ejecting position of the said mold; cam-disk rotating in a plane at right angles with that of the mold-disk; a rock-shaft; bell-crank lever fast on the said shaft and to the outer end of one arm of which the opposite end of the said link is connected, arm on the said shaft to be engaged by the cam-disk and its cam; spring pulling from a fixed point upon the other arm of the bell-crank lever to keep the said arm on the way-shaft in contact with the cam-disk and the mold in work opposite the composed line of matrices; cam on the cam-disk to engage with the said arm, way-shaft to rock the latter to make it pull the mold in work opposite the ejector; spring-actuated pin in the nose of the link to keep the latter pivotally connected to the mold-disk; lever to disengage it therefrom; and a hole in the mold-disk for each mold thereon to receive the said pin.

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

ERNEST GIROD.

Witnesses:
VINCENT FANE HANDLEY,
JOHN NELSON BANKS.