No. 834,777. PATENTED OCT. 30, 1906.

R. C. VETTER.

TYPE MAKING MACHINE.

APPLICATION FILED MAR. 22, 1906.

3 SHEETS—SHEET 1.

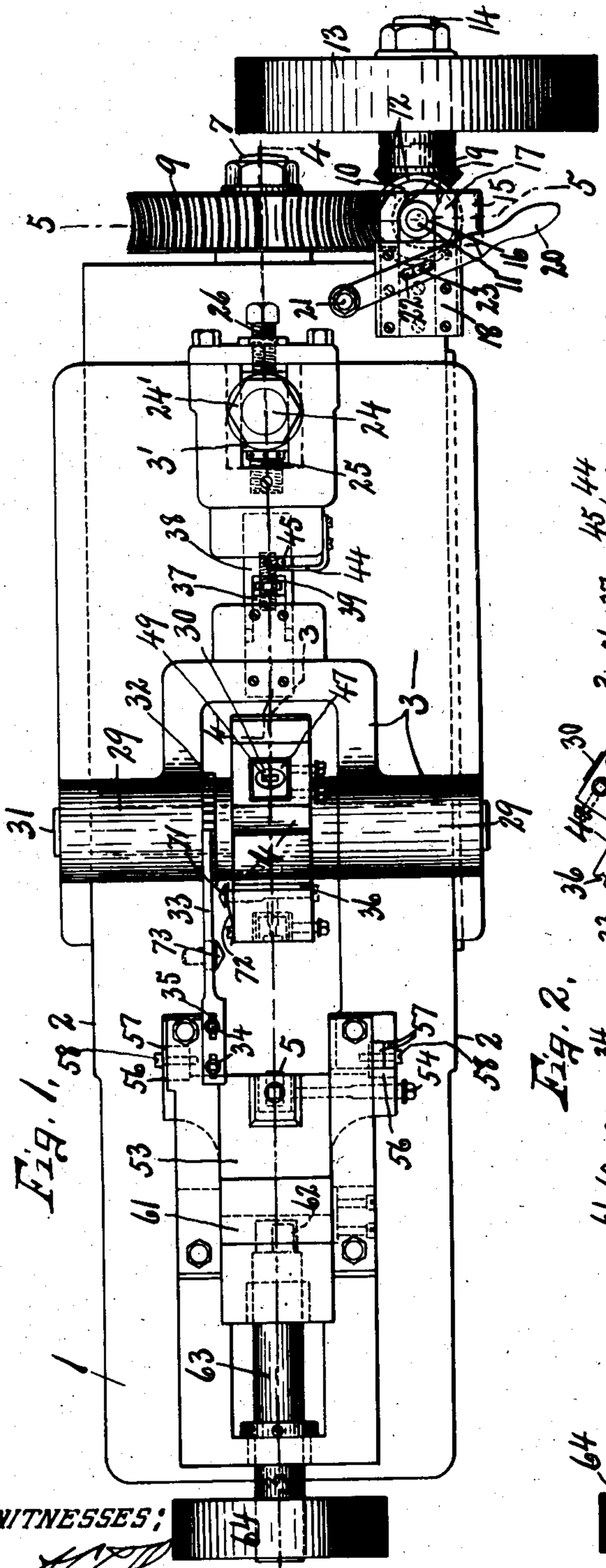

Fig. 1.

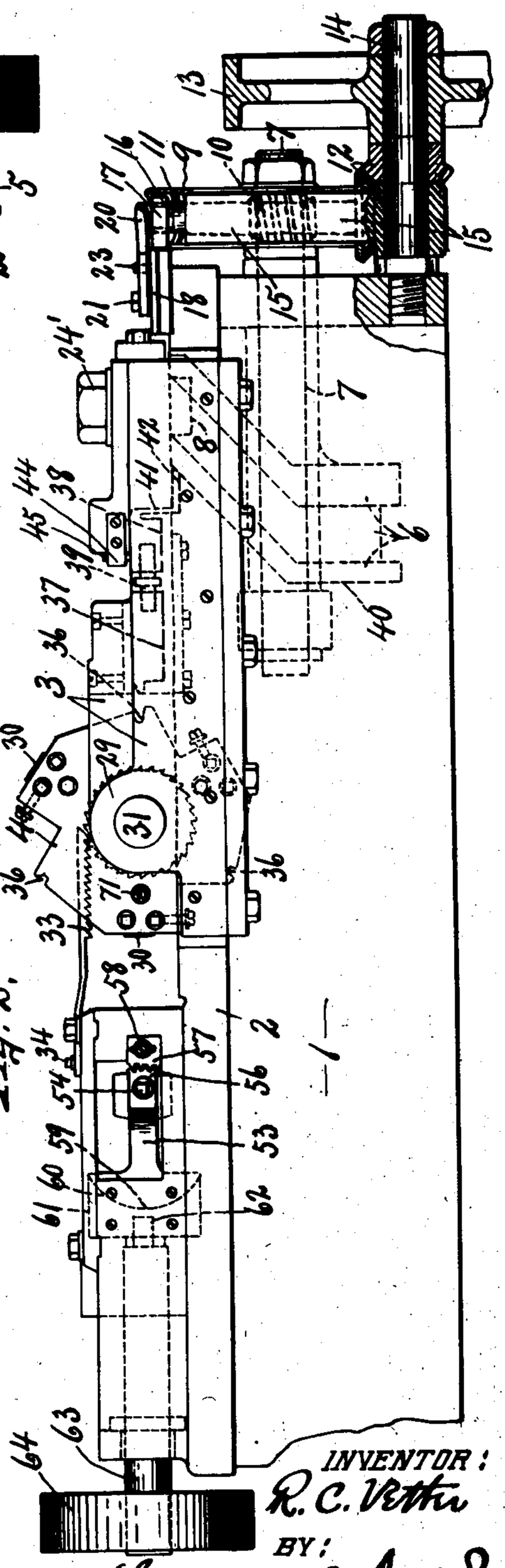

Fig. 2.

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3 SHEETS—SHEET 2.

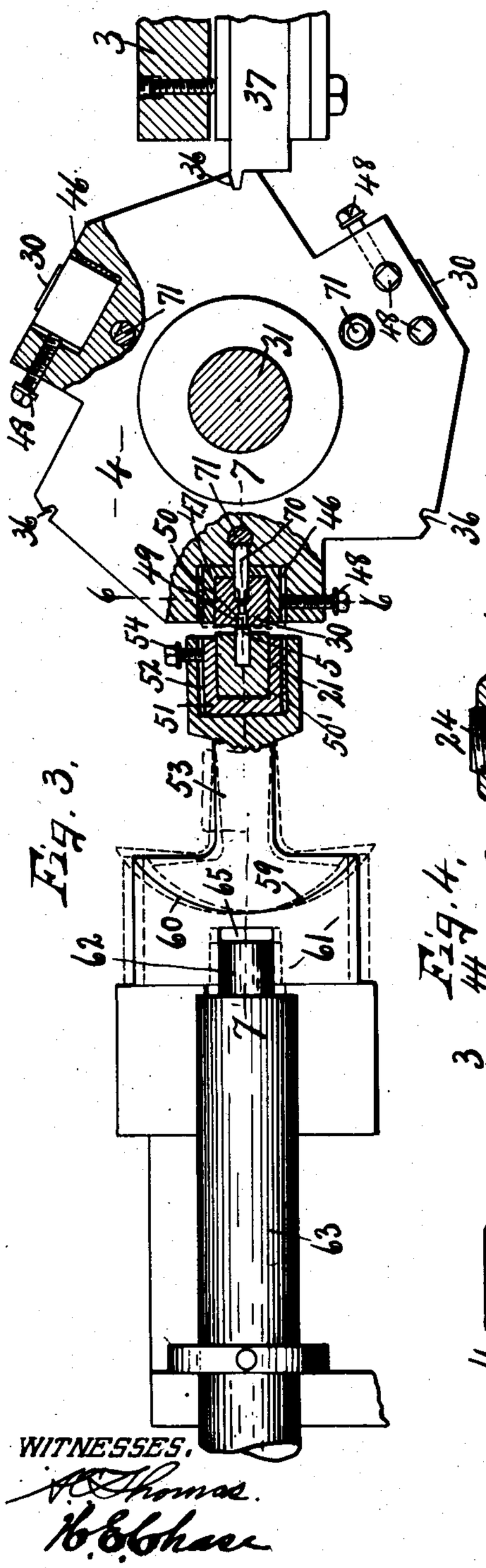

Fig. 3.

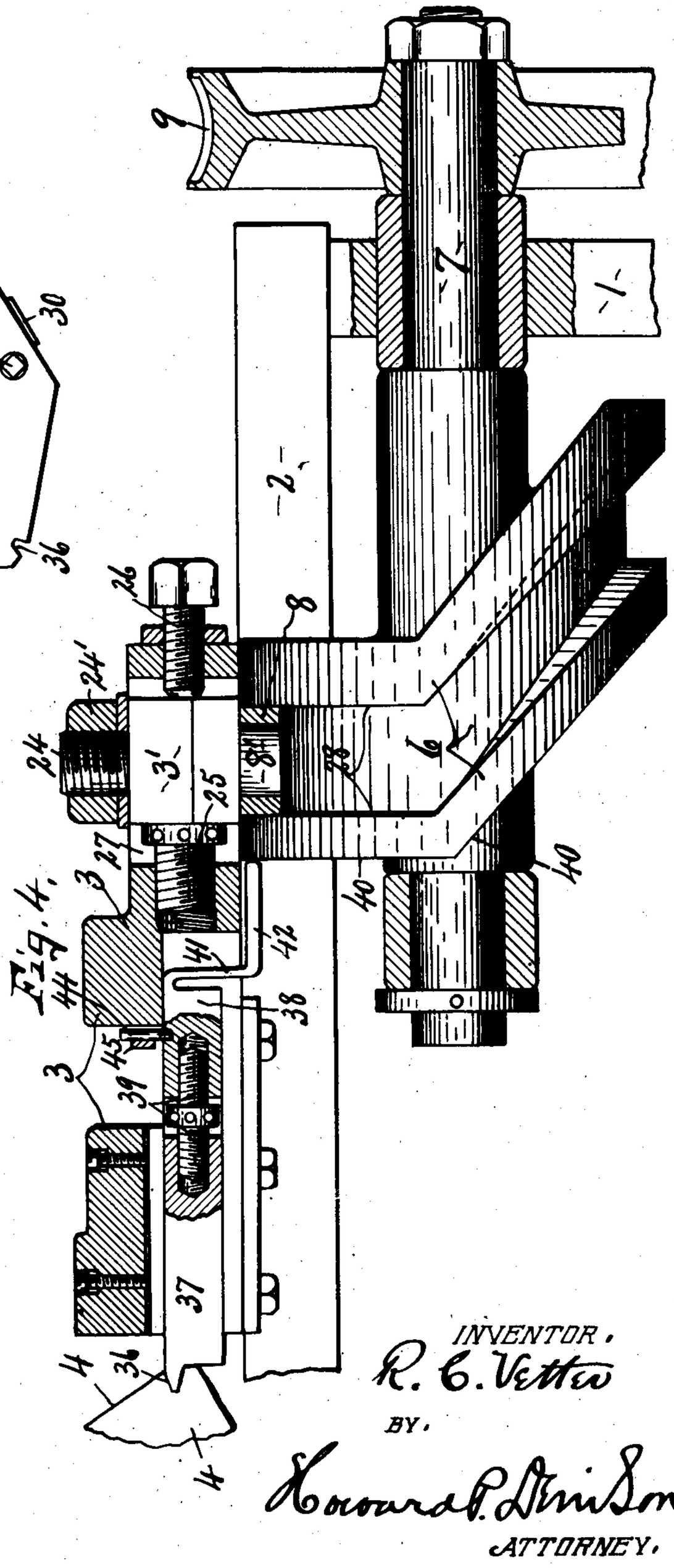

Fig. 4.

WITNESSES.

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3 SHEETS—SHEET 3.

Fig. 5.

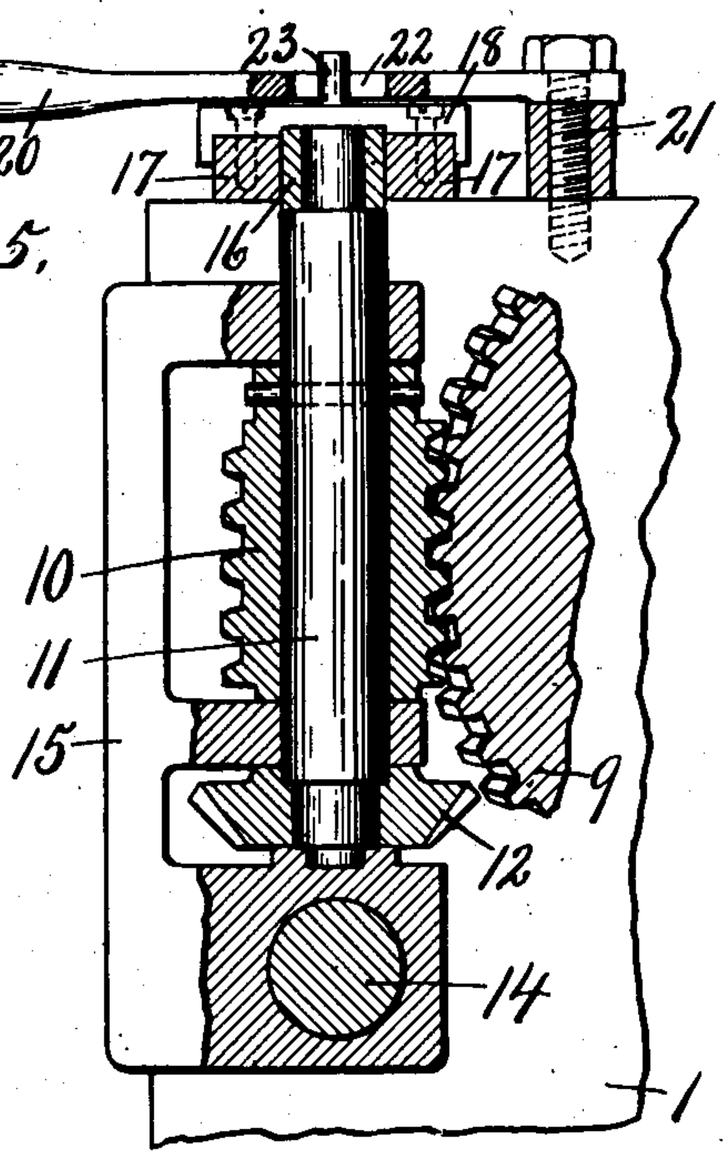

Fig. 6

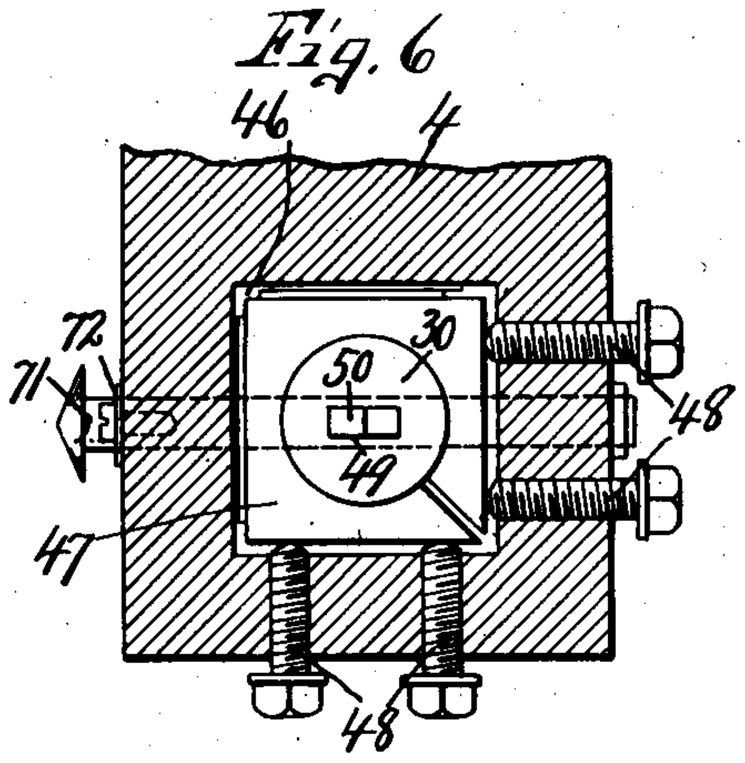

Fig. 7.

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UNITED STATES PATENT OFFICE.

RUDOLPH C. VETTER, OF SYRACUSE, NEW YORK.

TYPE-MAKING MACHINE.

No. 834,777. Specification of Letters Patent. Patented Oct. 30, 1906.

Application filed March 22, 1906. Serial No. 307,446.

To all whom it may concern:

Be it known that I, RUDOLPH C. VETTER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Type-Making Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in type-making machines, and is especially adapted for the economic manufacture of type which are to be fixed to the type-bars of type-writing machines. These type are preferably made from suitable stock-metal blanks, which are cold-pressed to the desired form under rolling contact with a suitable matrix, and in my present machine these blanks are previously cut to the desired length and are placed by hand in suitable holding devices or chucks, by which they are successively presented to the matrix and firmly held during the operation of making the impression by the rolling contact of the matrix therewith.

One of the essential objects, therefore, of my present invention is to provide a series of blank-holding devices by which the blanks may be successively brought into position to receive an impression from the matrix and to enable the operator to supply the blanks to the holders during the impression-making operation, thereby obviating loss of time, such as would occur if but a single holding device were employed. This object, more specifically stated, is to provide the machine with a rotary turret having a plurality of chucks or holders adapted to receive and retain the blanks and to successively feed them into position to receive an impression from an oscillatory matrix and to employ suitable mechanisms for locking the turret in its adjusted position during the impression-making operation and for ejecting the type-plates from their respective holders as they are successively formed.

Another object is to provide means for automatically rotating the turret step by step or one clutch-space at a time during each cycle of operation.

A further object is to mount the matrix in a suitable oscillatory support which is fulcrumed at one end by intermeshing teeth located in the plane of rolling contact of the matrix with the blank in which the type are formed and to seat the opposite end of the matrix-support in a reciprocatory curved bearing actuated transversely of the reciprocatory action of the turret-supporting carriage, so that the matrix support is held solely at its ends without intermediate connections for producing a perfect rolling contact of the matrix with the blank, and thereby obtaining a more perfect formation of the type.

A still further object is to provide means for the adjustment of certain mechanisms to take up any incidental wear or lost motion.

Other more specific objects will be brought out in the following description.

In the drawings, Figures 1 and 2 are respectively top plan and side elevation of a type-making machine embodying the various features of my invention. Figs. 3 and 4 are longitudinal vertical sectional views taken, respectively, on lines 3 3 and 4 4, Fig. 1. Fig. 5 is a transverse vertical sectional view taken on line 5 5, Fig. 1, showing particularly the means for throwing the driving mechanism into and out of connection with the carriage-feeding mechanism. Figs. 6 and 7 are sectional views taken, respectively, on lines 6 6 and 7 7, Fig. 3.

In carrying out the objects stated I have sought to construct the machine with as few parts as may be consistent with the work required and also to simplify the operation of the several mechanisms so as to increase the permanency and durability of the machine and to enable it to be operated by comparatively cheap or unskilled labor without liability of unduly impairing any of its mechanisms or necessitating frequent adjustment.

As shown in the drawings, this machine comprises, essentially, a supporting bed or frame 1, having at its top opposite lengthwise flanges 2, forming suitable ways upon which is mounted a carriage 3 for supporting a rotary turret-head 4.

The carriage 3 is reciprocated back and forth along the ways 2 toward and from a suitable matrix 5 by means of a rotary cam 6, which is mounted upon and secured to a shaft 7 and is provided with a circumferential cam-groove for receiving a roller 8 upon the carriage 3, whereby the carriage is positively actuated back and forth along the ways 2.

The shaft 7 is provided with a worm-gear 9, which meshes with a worm 10 upon an up-

right shaft 11, which is connected by miter-gears 12 to the main driving-pulley 13. This pulley 13 and one of the gears 12 are interlocked with each other and are loosely mounted upon a fixed stud 14, which is screwed into the adjacent end of the frame 1.

The upright shaft 11 is journaled in a swinging yoke 15, which is pivotally mounted at its lower end upon the shaft or stud 14 and is adapted to be rocked upon its pivot to throw the worm 10 into and out of mesh with the worm-gear 9 for making and breaking connection between the driving-pulley 13 and cam-shaft 7, so that the latter may be stopped any time without interrupting the movement of the main driving mechanism. In order to accomplish this shifting movement of the upright shaft 11, the upper end of the latter is provided with a roller 16, which is held between the arms, as 17, of a bifurcated sliding yoke 18, the adjacent faces of said arms being provided with inclined cam-faces 19 for engaging opposite faces of the roller 16 and forcing the upper end of the shaft transversely of the axis of the cam-shaft 7 a sufficient distance to throw the worm 10 into and out of engagement with the worm-gear 9.

The sliding yoke 18 is actuated back and forth by means of a lever 20, which is pivoted at 21 to the frame 1 and is provided with a lengthwise slot 22, receiving a pin 23 on the yoke 18, whereby motion is transmitted from the lever 20 to the yoke 18 to rock the shaft 11, and thereby move the worm 10 into and out of mesh with the worm-gear 9, which is secured to the cam-shaft 7.

The roller 8 is mounted on a stud 8′ on the lower end of an adjustable head 3′, which is slidable in suitable ways in the carriage 3 and is provided with an upwardly-projecting threaded stud 24, engaged by a nut 24′, by which the head 3′ is clamped in its adjusted position between opposite adjusting-screws 25 and 26, as best seen in Fig. 4.

The adjusting-screws 25 and 26 are engaged with threaded apertures in the opposite ends of the opening, as 27, in which the head 3′ is movable endwise to permit proper adjustment of the roller 8 to register with the cam-groove, as 28.

Substantially one-half of the cam-groove 28 is deflected or offset axially sufficient to bring the operating-face of the turret 4 into and out of engagement with the matrix 5, while the remaining half of said groove is disposed at substantially right angles to said axis to hold the turret with one of the blanks in contact with the matrix during the impression-making operation, which is accomplished during half a revolution of a cam 6.

The offset portions of the cam-groove 28 are of comparatively steep pitch, so as to quickly advance and return the turret-supporting carriage to and from the matrix.

The turret 4 is rotatingly mounted upon a transverse horizontal axis in suitable bearings 29 upon the carriage 3 and is provided with a series of (in this instance three) operating-faces, each carrying a blank-holding chuck 30 and adapted to be successively brought into registration with the matrix 5. As shown in the drawings, this turret is mounted upon a shaft 31 and is provided with a ratchet-wheel 32, the teeth of which are adapted to be engaged by a toothed rack 33, which is adjustably secured by suitable bolts 34 to the upper portion of the frame 1 of the machine. This toothed rack 30 is preferably made of spring metal of sufficient resiliency to permit its teeth to ride over the teeth of the ratchet-wheel 32 during the forward movement of the carriage 3 toward the matrix and to cause the teeth of said rack to engage the teeth of the ratchet-wheel 32 and rotate the turret 4 one chuck-space during the return of the carriage from its operating to its normal position, as best seen in Figs. 1 and 2.

The toothed end of the rack 33 is, therefore free to yield vertically, while its attaching end is provided with slots 35 for receiving the clamping-screws 34 and permitting proper adjustment of the rack to mesh with the teeth of the ratchet 32 and produce the desired step-by-step movement of the turret to bring each chuck into exact alinement with the matrix 5. In the use of this rotary turret it is desirable to temporarily lock it in its adjusted position during the impression-making operation, and for this purpose each operating-face of the turret is provided with a transverse recess or notch 36, adapted to receive one end of a locking-bolt, which in this instance is composed of two sliding bolt-sections 37 and 38, guided in suitable ways in the carriage 3 and connected by an adjusting-screw 39, having right and left hand threaded ends engaging corresponding threaded sockets in the adjacent ends of the bolt-sections 37 and 38, so that by rotating the screw 39 in one direction or the other the bolt-sections 37 and 38 will be correspondingly drawn together or forced apart for the purpose of bringing the locking-bolt into proper correlation with its operating-cam, as the end face 40 of the cam 6, whereby the locking end of the bolt-section 37 is forced into the alined recess 36 of the turret 4 just before or at about the same time that the operating-face of the turret is advanced to the matrix.

The locking-bolt section 38 is provided with a spring-arm 41, having its free end offset longitudinally and terminating against the cam-face 40 of the cam 6, the greater portion of which is disposed at substantially right angles to the axis of revolution of said cam and equal to about half of its circumference corresponding to the similar portion 28 of the cam-groove which receives the roller 8.

The spring 41 on the locking-bolt section

38 permits the locking-bolt section 37 to be held in operative position in the adjacent recess 36 under a yielding tension and compensates for any inequality in the cam-face 40, against which the end of the arm 42 bears.

It is now obvious that when the carriage 3 and its turret 4 are advanced by the inclined cam 28 the locking-bolt sections 37 and 38 are correspondingly advanced with the carriage until the roller 8 begins to enter the annular groove 28, whereupon the cam 40, a portion of which is inclined longitudinally, engages the end of the spring-arm 42 and causes a quick forward movement of the sliding bolt-sections 37 and 38 to force the end of the bolt-section 37 into the adjacent recess 36, and owing to the fact that the greater portion of the cam-face 40 is at substantially right angles to the axis of rotation of the cam 6 and of substantially the same circumferential length as the groove 28 it is evident that the locking-bolt will be held in operative position until the carriage begins to return by the cam-groove 28, acting upon the roller 8, whereupon the sliding locking-bolt is returned to its normal position by a spring-arm 44, which has its free end bearing against a pin 45 on the sliding bolt-section 38, as best seen in Figs. 1, 2, and 4.

The pin 45 is interposed between the spring 44 and adjacent portion of the carriage, which latter acting upon said pin serves to move the locking-bolt forward with the carriage; but as soon as the carriage reaches the limit of its forward movement, as determined by the cam-groove 28, the locking-bolt is further advanced by the cam 40 against the action of the spring 44, so as to positively interlock with the recess 36 in the adjacent face of the turret, and as soon as the carriage begins to return by the action of the inclined groove 28 upon the roller 8 the inclined portion of the cam-face 40, corresponding to the inclined groove 28, relieves the tension on the spring 44, which immediately acts upon the pin 45 to return the sliding bolt to its normal position, with the pin 45 bearing against the adjacent face of the carriage.

As previously stated, the turret 4 is provided with a series of (in this instance three) operating-faces, each of which is provided with a recess or socket 46, in which is inserted a split bushing 47 for receiving one of the chucks 30, said bushing being slightly smaller in its outer dimensions than the socket or recess 46 in which it is inserted to afford a limited adjustment and is held in operative position by suitable adjusting-screws 48, so that the bushings 47 may be adjusted to bring their respective chucks 30 into exact registration with the matrix 5.

Each chuck 30 is therefore frictionally held in place by its respective split bushing 47, which in turn is held in the socket 46 by the adjusting-screws 48, the latter serving the double purpose of holding the bushings in place and also for pressing the split bushing upon its inclosed chuck.

Each chuck 30 is provided with a central recess 49 for receiving and retaining one of the type-blanks, as 50, which is usually placed by hand in the upper chuck 30 during the impression-making operation of the matrix upon the type-blank which was previously placed in another chuck and now brought into registration with the matrix, as best seen in Fig. 3.

As soon as each chuck, with its type-blank therein, is advanced into position to receive an impression from the matrix 5 said matrix is rolled across the face of the blank with sufficient pressure to leave its impression in said blank, and for this purpose the matrix, which may be changed at will, is removably seated in a suitable holder 50′, which in turn is held in a split bushing 51 in a socket 52 in one end of an oscillatory element 53. The holder 50′ and split bushing 51 correspond to the chuck 30 and bushing 47 of the blank-holding turret, and the split bushing 51 is clamped upon the holder 50′ by suitable adjusting-screws 54. This oscillatory member 53 constitutes an important part of my invention and, as shown in Fig. 2, consists of a metal bar or casting of suitable strength to resist compression strains to which it is subjected and has one end, in which the matrix 5 is mounted, provided with opposite toothed segments 56, meshing with companion toothed racks 57, which latter are secured by suitable fastening means, as screws 58, to the upper portion of the frame 1, while the other end of said oscillatory element 53 is provided with a curved bearing-face 59, which is seated in a correspondingly curved bearing 60 in the adjacent face of a vertically-reciprocating element 61.

The toothed segments 56 are disposed in the same circular plane concentric with and of substantially the same radius as the curved bearing 59, and therefore the oscillatory element 53 constitutes a segment of a roller having one side formed with toothed segments meshing with straight vertical racks 57, while the other end is supported in the curved bearing 60 of the vertically-sliding element 61.

The pitch-line of the toothed segments 56 and operating-face of the matrix 5 are disposed in substantially the same curved plane, and it is therefore clearly obvious that as the element 61 is reciprocated vertically the element 53 will be correspondingly oscillated or rolled vertically along the racks 57, thereby causing the matrix to roll across the face of the type-blank which may be in contact therewith, leaving the impression of said matrix on the blank.

The vertically-sliding element 61 is actuated by a revolving eccentric 62 on the end of

a rotary shaft 63, which is journaled in the upper portion of the frame 1 and is provided with a driving-pulley 64, which may be connected to any available source of power not necessary to herein illustrate or describe.

The eccentric-pin 62 on the end of the shaft 63 operates in a suitable slot or recess 65 in the adjacent end of the element 61, said slot being of substantially the same vertical depth as the diameter of the eccentric-pin 62, but is elongated transversely sufficient to permit the free rotation of the eccentric without effecting and lateral movement of the sliding element 61, which is guided in suitable ways in the frame 1.

Each of the toothed racks 57 is preferably made in two sections placed side by side, and each provided with a corresponding number of teeth which may be adjusted relatively to each other to take up any incidental wear for the purpose of preventing loss motion between the toothed segments 56 and racks 57, the clamping-bolts 58 serving to retain the latter sections in their adjusted position.

In order to relieve the strain upon the intermeshing teeth of the segments 56 and racks 57, I provide the oscillatory members 53 with opposite bearing-faces 55, which are disposed in the same plane as the pitch-line of the segments 56 and bear upon corresponding vertical bearing-faces 66 just inside of the racks 57. This action of the oscillatory member 53 to roll the matrix across the face of the blank for making an impression in the latter takes place during substantially half a revolution of a cam 6, or while the cam-groove 28 is holding the carriage in its advanced position, and when the eccentric-shaft 63 is driven by a separate mechanism from that which operates the cam 6 it is evident that the carriage may be held in its advanced position as long as desired by simply throwing the worm 10 out of mesh with the worm-gear 9, thereby allowing the matrix to be rolled back and forth across the face of the blank as many times as may be necessary to produce the desired impression therein; but under ordinary conditions the rolling action of the matrix and its actuating mechanism and also the action of the cam upon the carriage are continuous, the period of holding the carriage in its advanced position being ordinarily sufficient to allow the matrix to make the desired impression in the blank.

After the matrix has left its impression in the blank registered therewith the inclined portion of the cam 6 acting upon the roller 8 draws the carriage 3 and turret 4 back away from the matrix, during which operation the toothed rack 33 engages the teeth of the ratchet 32 and rotates the turret one chuck-space, or in this instance one-third of a revolution, to bring the next succeeding chuck and type-blank therein into longitudinal alinement with the matrix.

Immediately upon the withdrawal of the carriage and turret from the matrix the blank in which an impression has just been made is expelled or ejected from the chuck by means of a plunger 70 and transversely-sliding cam-bolt 71, which is actuated against the action of a spring 72 by a fixed cam 73, as best seen in Figs. 1 and 3.

The essential features of my invention briefly described are as follows: a rotary turret having a plurality of type-blank holders, means for rotating the turret to bring each blank to a certain predetermined position to receive an impression from the matrix, means to roll the matrix across the face of each type-blank as they are successively presented thereto, means for actuating the turret-carriage backward and forward, separate means for transmitting oscillatory motion to the matrix-support for rolling said matrix across the type-blank, and additional means for throwing the main driving mechanism into and out of operative connection with the carriage-operating cam. In substantially all of the sliding elements hereinbefore described I employ suitable gibs and adjusting devices to take up any incidental wear and prevent as far as practicable excessive loss motion.

What I claim is—

1. In a type-making machine, an oscillatory non-rotatable matrix, and a plurality of type-blank holders movable successively into registration with and toward and from the matrix to impress each blank against the same matrix.

2. In a type-making machine, an oscillatory non-rotatable matrix and a rotary element having a plurality of type-blank holders adapted to be brought, one at a time, into registration with the matrix as said element is rotated and means for moving said element radially to impress each blank against said matrix.

3. In a type-making machine, an oscillatory non-rotatable matrix, a turret having a plurality of chucks for retaining the type-blanks, and means for rotating the turret one chuck-space at a time to bring each blank into position to receive an impression from the matrix.

4. In a machine of the class described, an oscillatory non-rotatable matrix, a rotary head having a series of type-blank holders adapted to be brought one at a time into alinement with the matrix, and means for advancing the head to impress the blank against the matrix.

5. In a machine of the class described, an oscillatory non-rotatable matrix, a rotary head having a series of type-blank holders adapted to be brought one at a time into alinement with the matrix, means for advancing the turret to impress the blank against the matrix, and additional means for rolling the matrix across the face of the blank.

6. In a machine of the class described, an oscillatory non-rotatable matrix-holder having a toothed segment, a rack meshing with the segment, and means for oscillating said holder along the rack.

7. In a machine of the class described, a rolling matrix-holder having concentric curved bearings, one at each end.

8. In a machine of the class described, an oscillatory non-rotatable matrix-holder having a curved toothed segment at one end and a toothed rack meshing therewith, and means to roll the holder along the toothed rack.

9. In a machine of the class described, a toothed rack, an oscillatory non-rotatable matrix-holder in rolling contact with said rack, and means to actuate said matrix-holder.

10. In a machine of the class described, a rack, an oscillatory non-rotatable matrix-holder in rolling engagement with the rack, and means including a sliding element engaging the matrix-holder for rolling the same along the rack.

11. In a machine of the class described, a toothed rack, a sliding element and actuating means therefor, and a matrix-hold having one end in rolling contact with the rack and its other end bearing upon and actuated by the sliding element.

12. In a machine of the class described, a straight rack and a sliding element movable parallel with the rack and a matrix-support having one end in rolling contact with the rack, and its other end bearing upon the sliding element.

13. In a machine of the class described, a toothed rack, a matrix-holder having a curved toothed segment at one end meshing with the rack and in rolling contact therewith, said matrix-holder having its other end provided with a curved bearing concentric with the toothed segment, and a sliding element moving parallel with the rack and having a curved seat for the adjacent curved bearing-face of the matrix-holder, and means to actuate said sliding element.

14. In a machine of the class described, a toothed rack, a matrix-holder having a curved toothed segment at one end meshing with the teeth of said rack and in rolling contact therewith, said rack being composed of sections, one of which is adjustable lengthwise of the other to take up loss motion and wear between the teeth of the segment and rack, and means to roll the matrix-holder along said rack.

15. In a machine of the class described, a rotary turret having a plurality of type-blank seats each adapted to be brought to a predetermined position by the rotation of the turret, means to rotate the turret step by step, and means for making an impression in the type-blanks as they are successively brought to such position.

16. In a machine of the class described, a type-forming matrix, a carriage movable to and from the matrix, actuating means for the carriage, a rotary turret on the carriage, a plurality of chucks on the turret adapted to be brought successively into longitudinal alinement with the matrix as the turret is rotated, and means brought into action by the movement of the carriage to rotate the turret step by step.

17. In a machine of the character described, the combination with an oscillatory non-rotatable matrix, a rotary turret having an independent movement to and from the matrix, means for effecting such independent movement, a plurality of chucks on the turret adapted to be successively brought into alinement with the matrix, means for rotating the turret one chuck-space at a time, and additional means for rolling the matrix across the face of the chuck.

18. In a machine of the character described, an oscillatory non-rotatable matrix, a rotary turret and a plurality of type-blank holders thereon, means for rotating the turret step by step to bring each holder to a predetermined position, means for locking the turret against rotation after each step-by-step adjustment, and means to move the turret toward the matrix for making an impression in the type-blanks as they are successively brought to said predetermined position.

19. In a machine of the character described, an oscillatory non-rotatable matrix, a carriage movable to and from the matrix, a type-blank holder on the carriage, means for actuating the carriage, and additional means for rolling the matrix across the face of the type-blank as the carriage is advanced thereto.

20. An oscillatory non-rotatable matrix-holder and a type-blank holder movable to and from the matrix, and separate actuating devices for said holders.

21. An oscillatory non-rotatable matrix-holder and a type-blank holder movable to and from the matrix and separate actuating devices for said holders, and means to throw the actuating device for the type-holder into and out of action.

22. In a machine of the class described, a revolving turret and a series of type-blank holders thereon, means to rotate the turret step by step to bring each holder to a predetermined position, an oscillatory non-rotatable matrix, and means to move the turret radially, to impress a type in each blank as it is brought to said predetermined position, and additional means to automatically eject each type-blank from its holder after the type have been impressed therein.

23. In a machine of the class described, an oscillatory non-rotatable matrix, a plurality of type-blank holders and means for moving them successively to one and the same position to receive an impression, to impress the blank against the matrix, and additional means for successively ejecting the type-blanks from their holders after the type are formed therein.

24. In a machine of the character described, an oscillatory non-rotatable matrix, a rotary turret, a plurality of type-blank holders on the turret, means to move the turret radially to impress each blank against the matrix, means for rotating the turret step by step to bring each holder in alinement with the matrix, an adjustable locking device movable into engagement with the turret to lock it in its adjusted position during the impression-making operation, and means for actuating the locking device.

25. In a machine of the character described, a carriage and actuating means therefor, a roller adjustably mounted on the carriage and engaging said actuating means.

26. In a machine of the character described, a carriage, a rotary cam and a stud adjustable upon and relatively to the carriage and engaged with the rotary cam.

27. In a machine of the character described, a sliding carriage, a rotary turret mounted on the carriage and provided with a plurality of chucks for receiving the type-blanks, means for rotating the turret one chuck-space at a time as the carriage moves in one direction, a locking member movable into and out of engagement with the turret and composed of sections adjustable relatively to each other, actuating means for the locking member and a yielding connection between said locking member and its actuating means.

28. In a machine of the character described, a rotary turret, a plurality of type-blank holders mounted on the turret, means for rotating the turret step by step to bring each holder to one and the same position, a sectional locking-bolt movable into and out of engagement with the turret to hold it in its adjusted position, means to actuate said bolt, separate means to adjust the sections of the bolt lengthwise relatively to each other, and a yielding connection between said locking-bolt and said actuating means.

29. In a machine of the class described, a rotary turret having a plurality of type-blank seats adapted to be brought to a predetermined position by the rotation of the turret, means for making an impression in the type-blanks as they are successively brought to such position, and additional means for automatically changing each type-blank after the impression has been made therein.

30. In a machine of the class described, a matrix, a rotary turret having a plurality of type-blank seats adapted to be brought successively into alinement with the matrix by the rotation of the turret, means for moving the turret toward and from the matrix to make an impression in the type-blanks as they are successively brought into alinement with said matrix, automatic means brought into action by the forward and backward movement of the turret to rotate the same step by step, and additional means brought into action by the rotation of said turret for successively ejecting the type-blanks from their seats after the impression has been made therein.

In witness whereof I have hereunto set my hand this 16th day of March, 1906.

RUDOLPH C. VETTER.

Witnesses:

H. E. CHASE,

MILDRED M. NOTT.