F. H. RICHARDS.

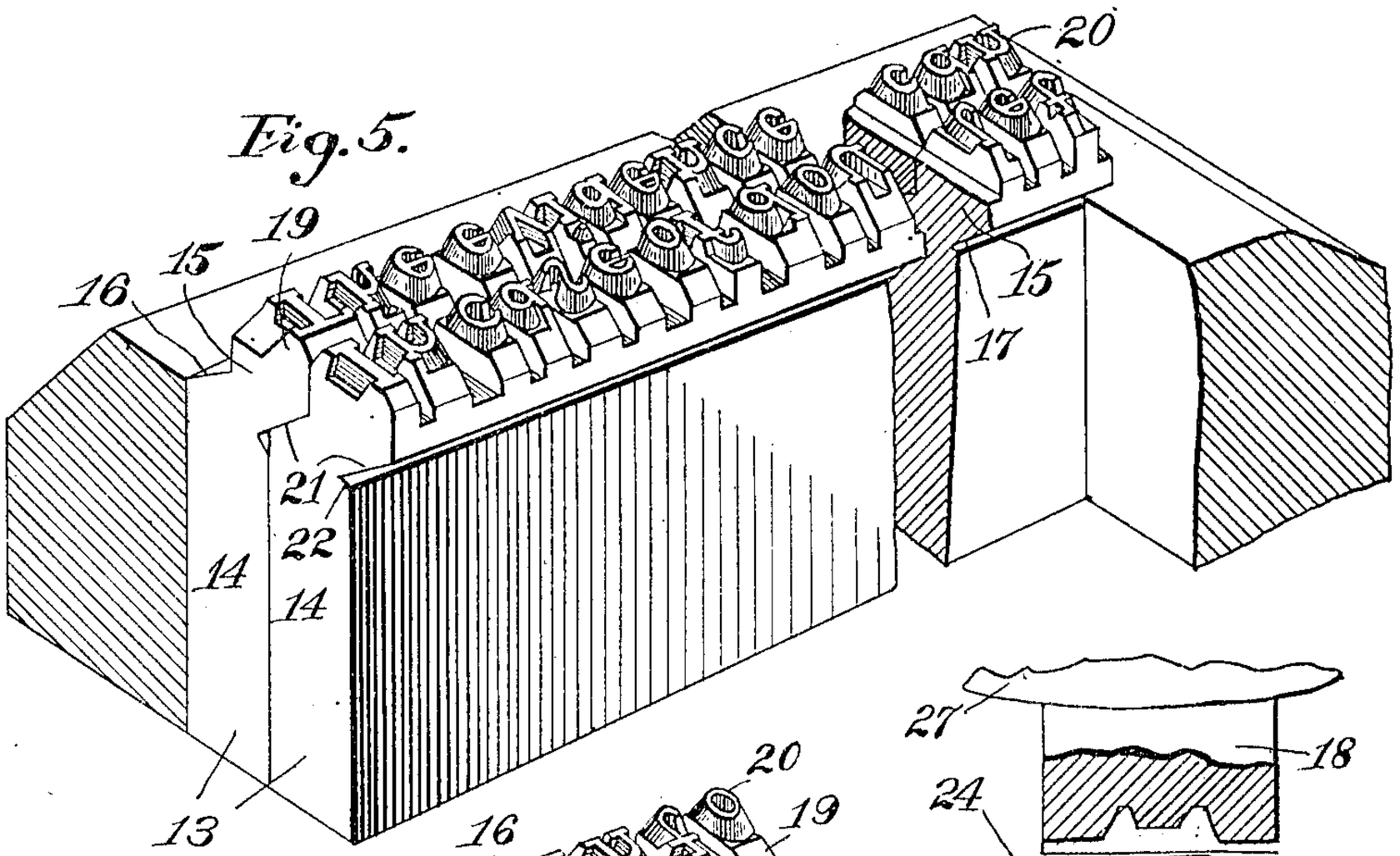
ART OF PRODUCING TYPE BARS.

APPLICATION FILED MAR. 11, 1903. RENEWED JUNE 5, 1909.

947,350. Patented Jan. 25, 1910.

7 SHEETS—SHEET 1.

Fig. 5.



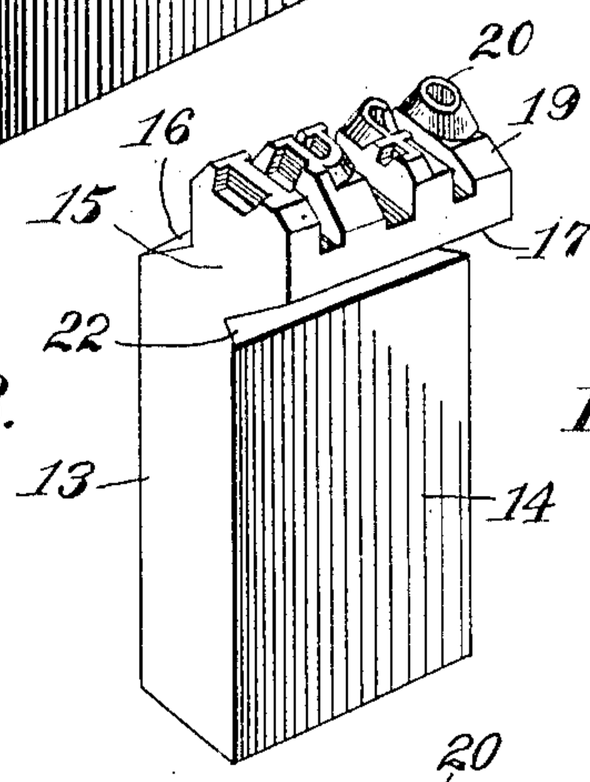


Fig. 3.

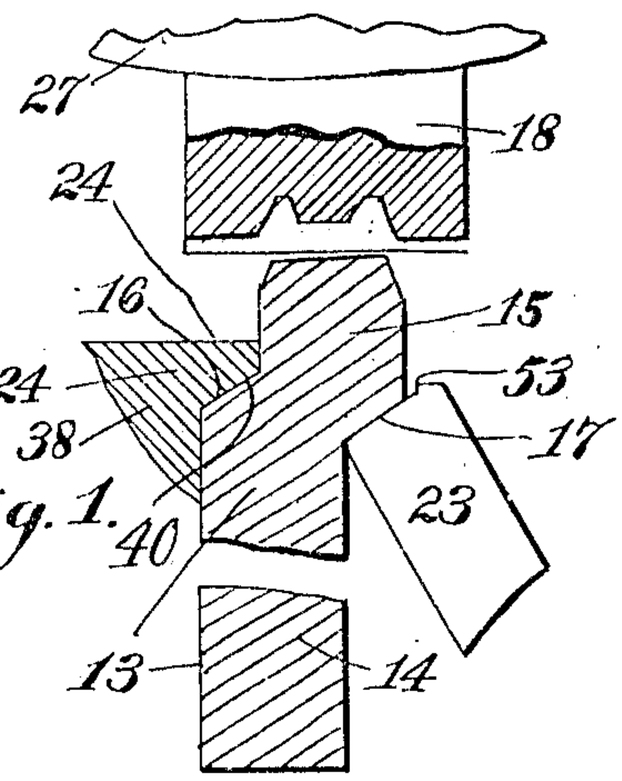


Fig. 1.

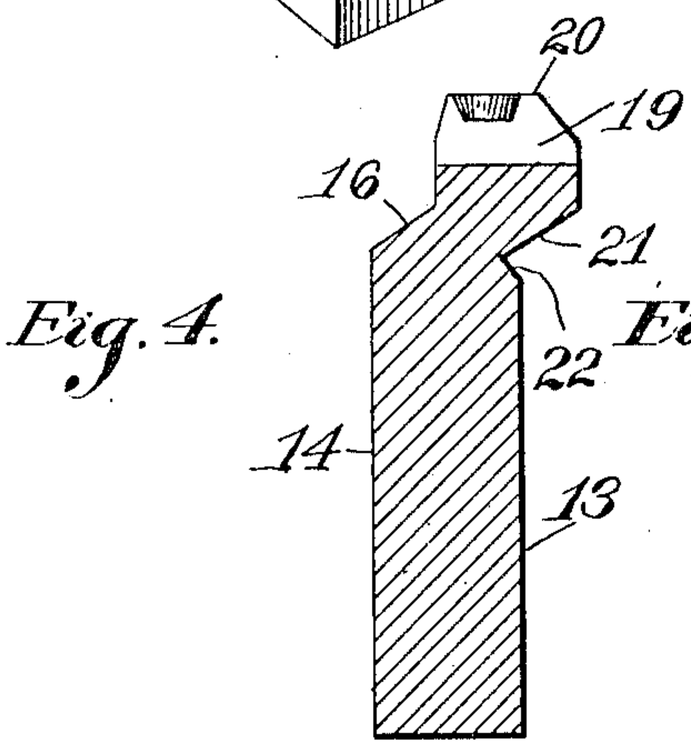


Fig. 4.

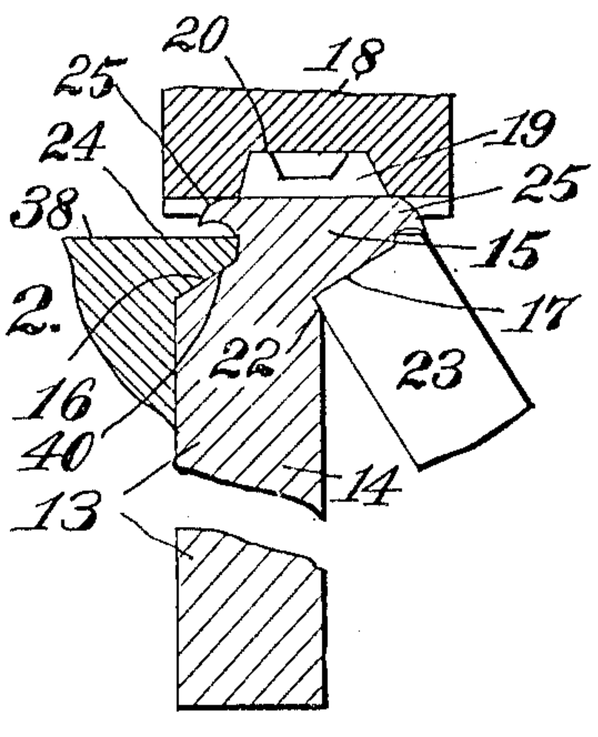


Fig. 2.

Witnesses.

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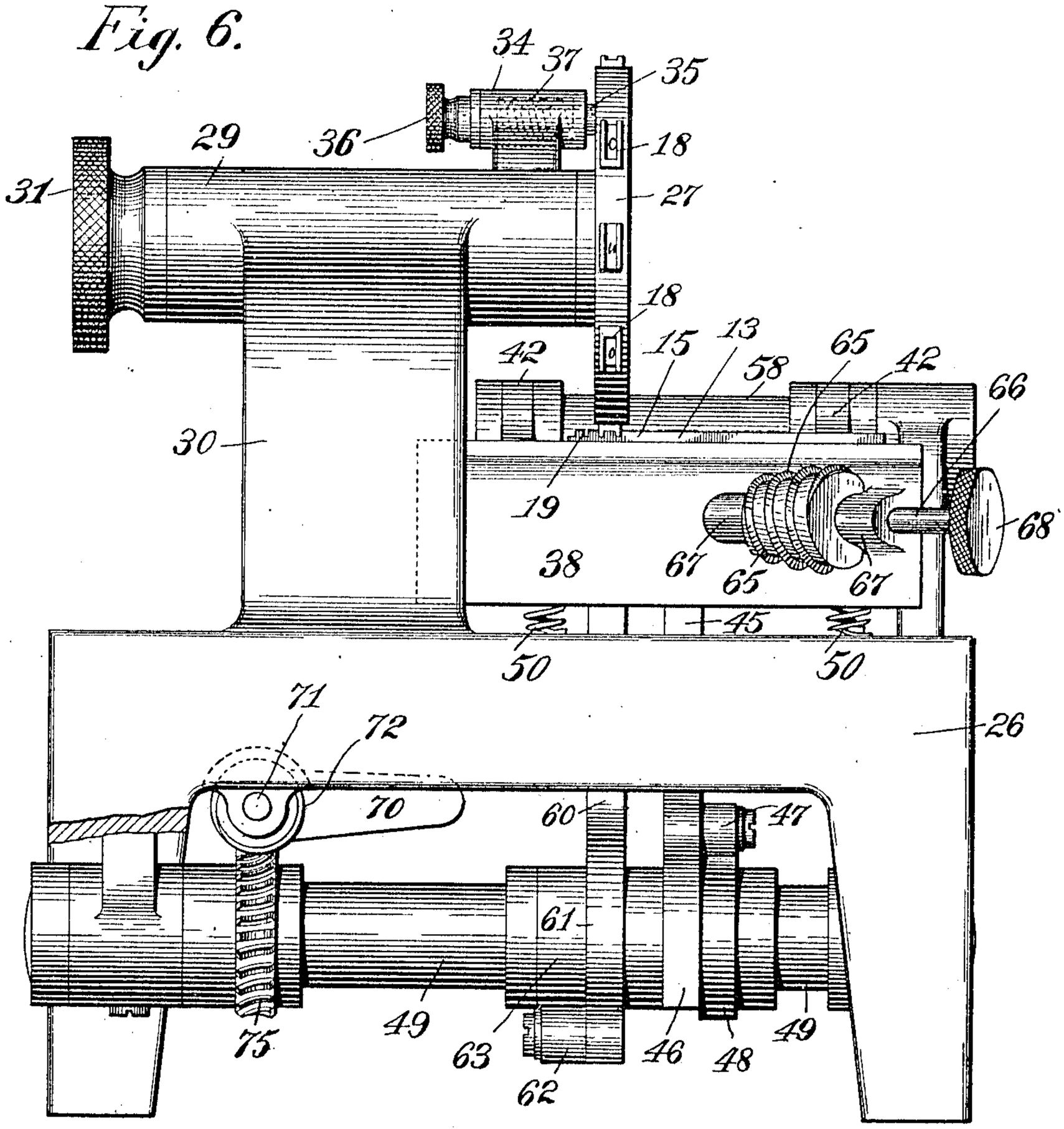
7 SHEETS—SHEET 2.

Fig. 6.



Witnesses:
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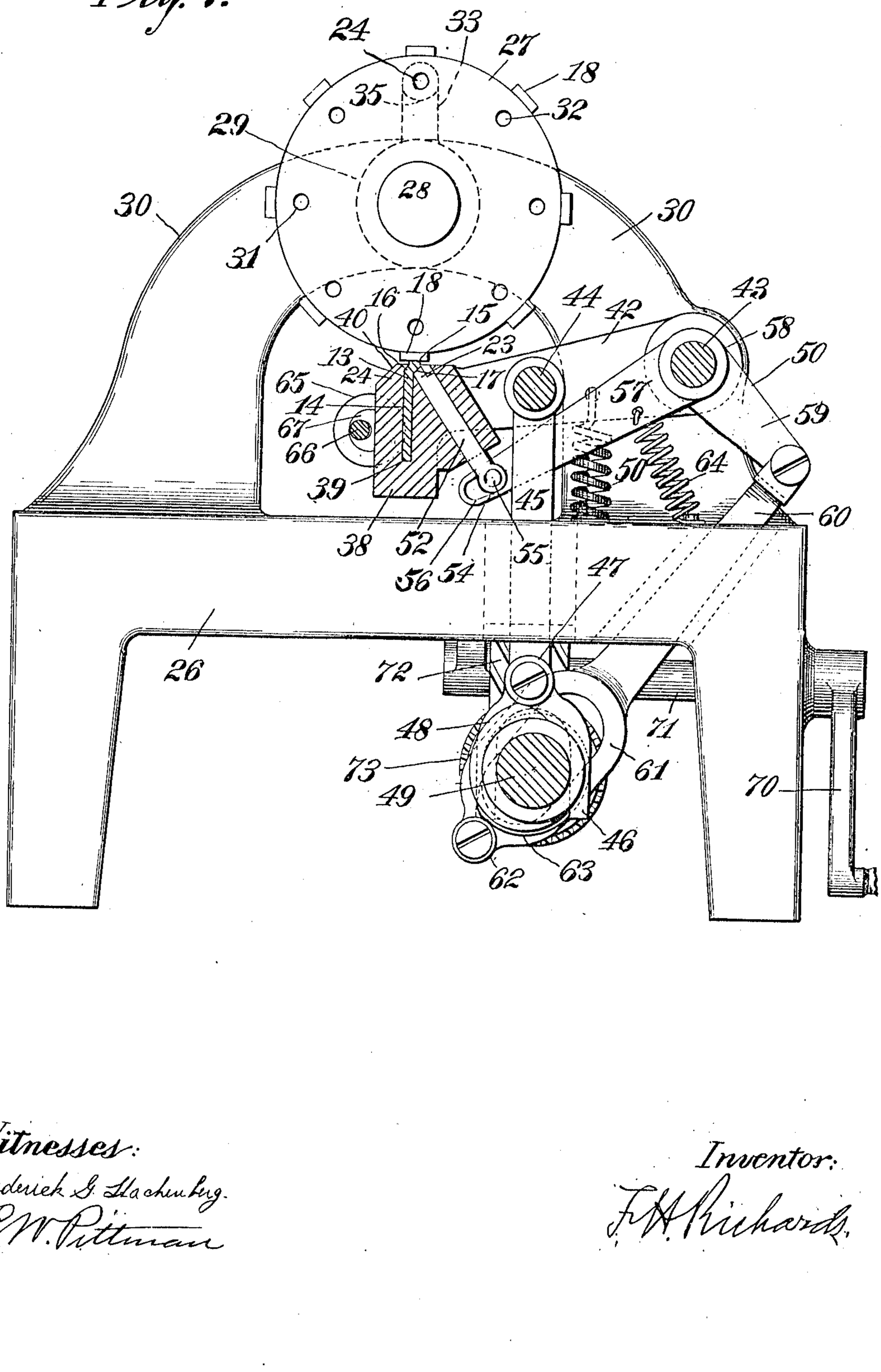
7 SHEETS—SHEET 3.

Fig. 7.



Witnesses:

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ART OF PRODUCING TYPE BARS.

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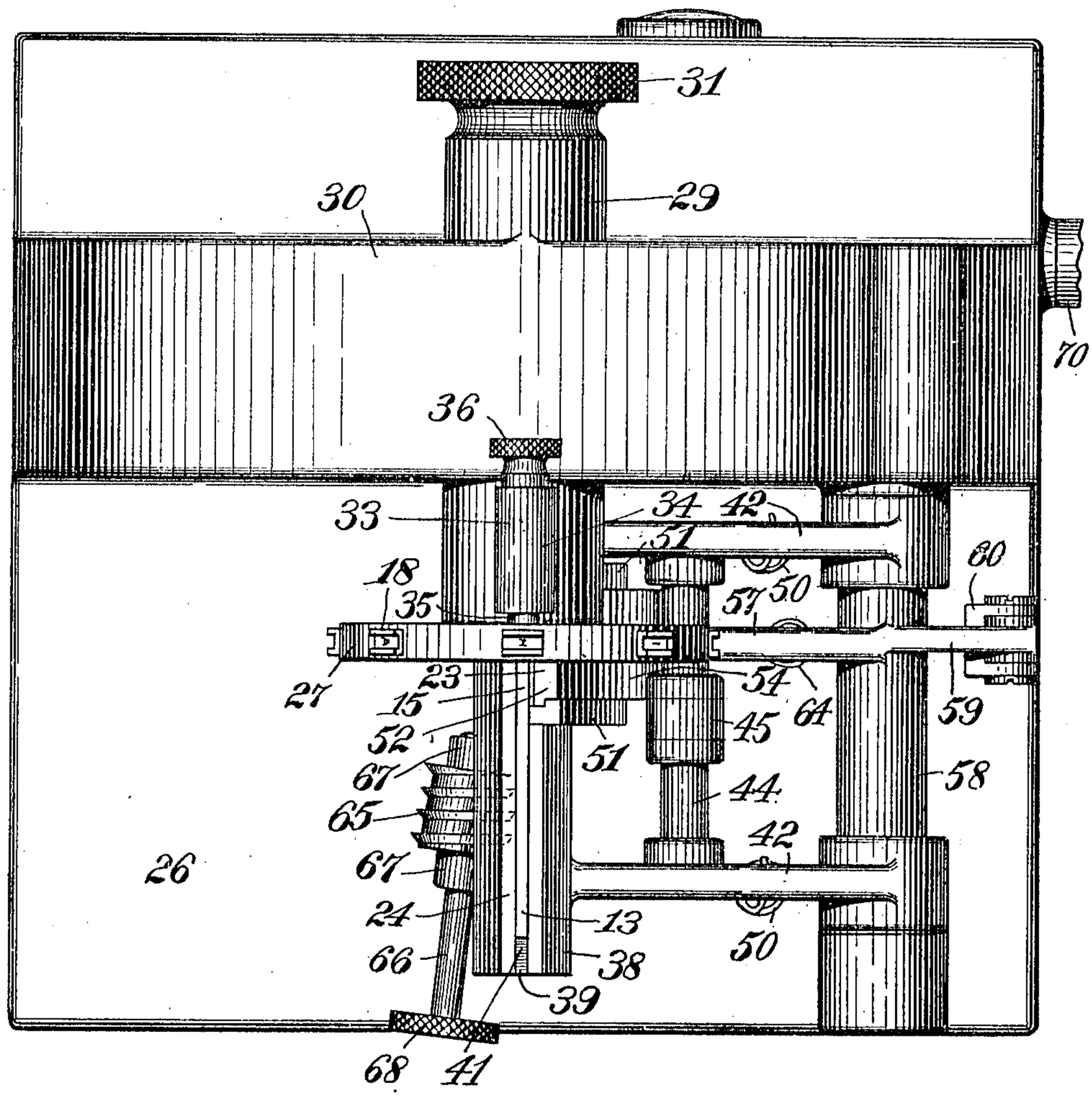
7 SHEETS—SHEET 4.

Fig. 8.



Witnesses:-
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R. W. Pittman

Inventor:
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F. H. RICHARDS.

ART OF PRODUCING TYPE BARS.

APPLICATION FILED MAR. 11, 1903. RENEWED JUNE 5, 1909.

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7 SHEETS—SHEET 5.

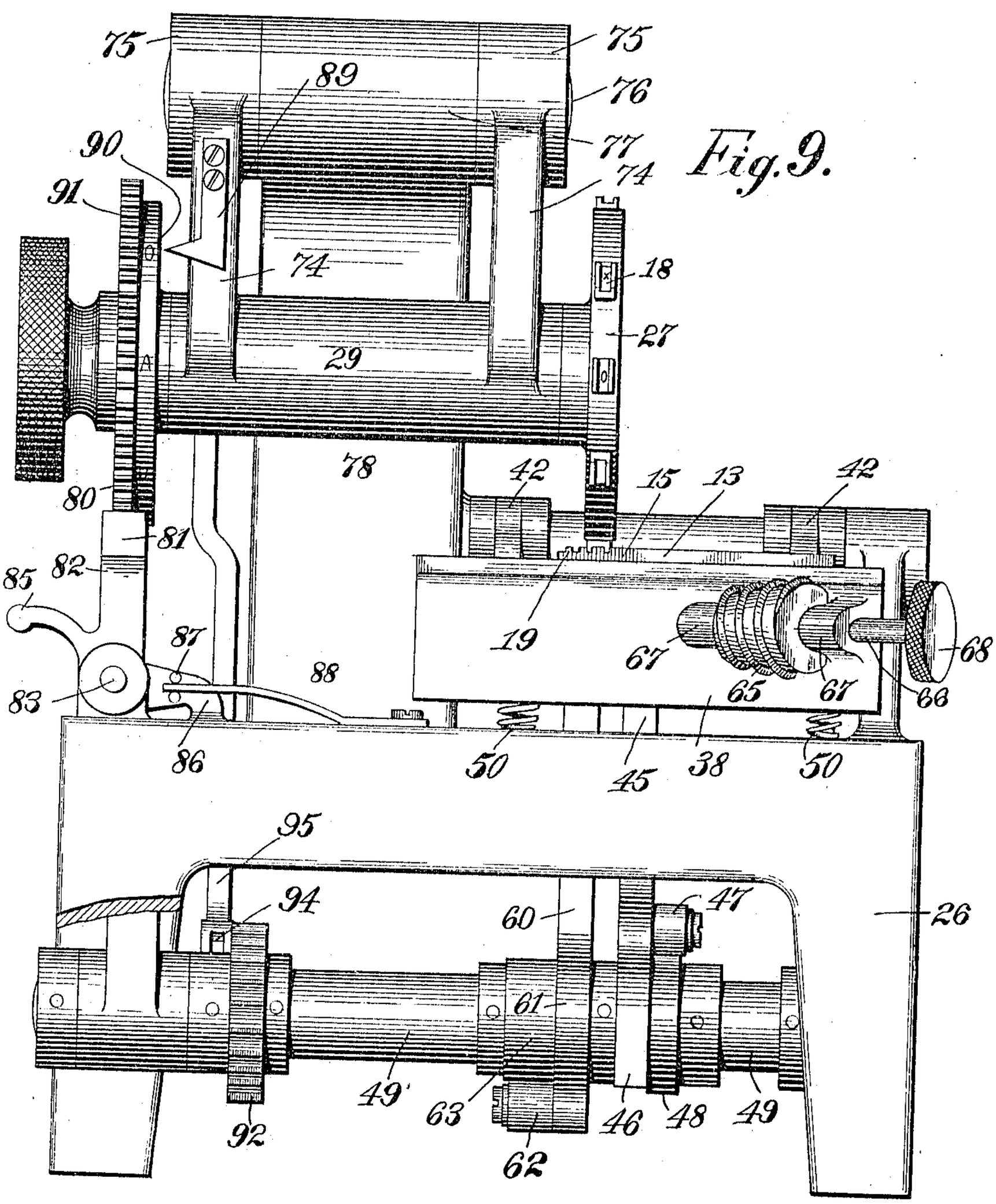

Fig. 9.

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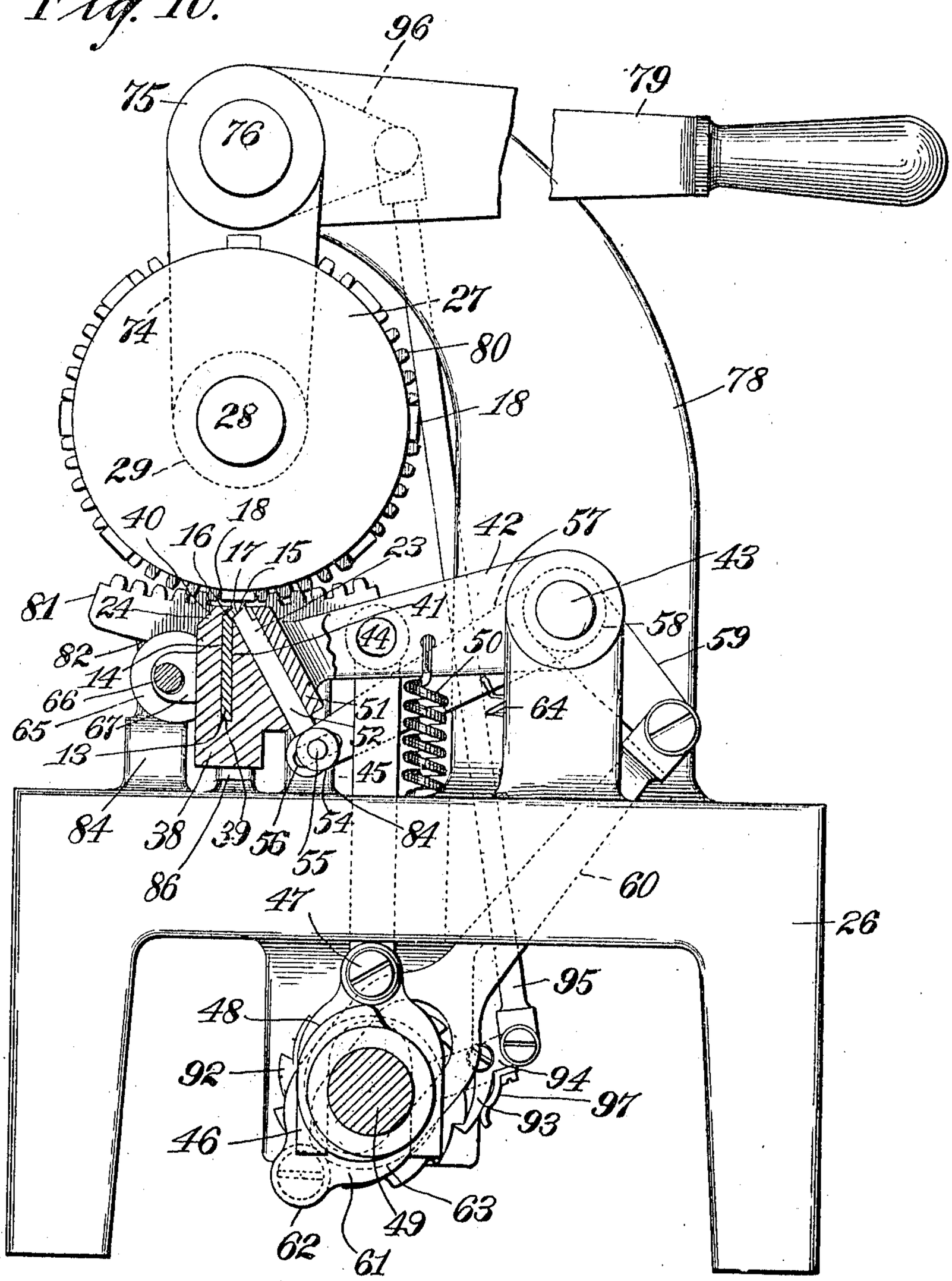
ART OF PRODUCING TYPE BARS.

APPLICATION FILED MAR. 11, 1903. RENEWED JUNE 5, 1909.

947,350. Patented Jan. 25, 1910.

7 SHEETS—SHEET 6.

Fig. 10.



Witnesses:

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ART OF PRODUCING TYPE BARS.

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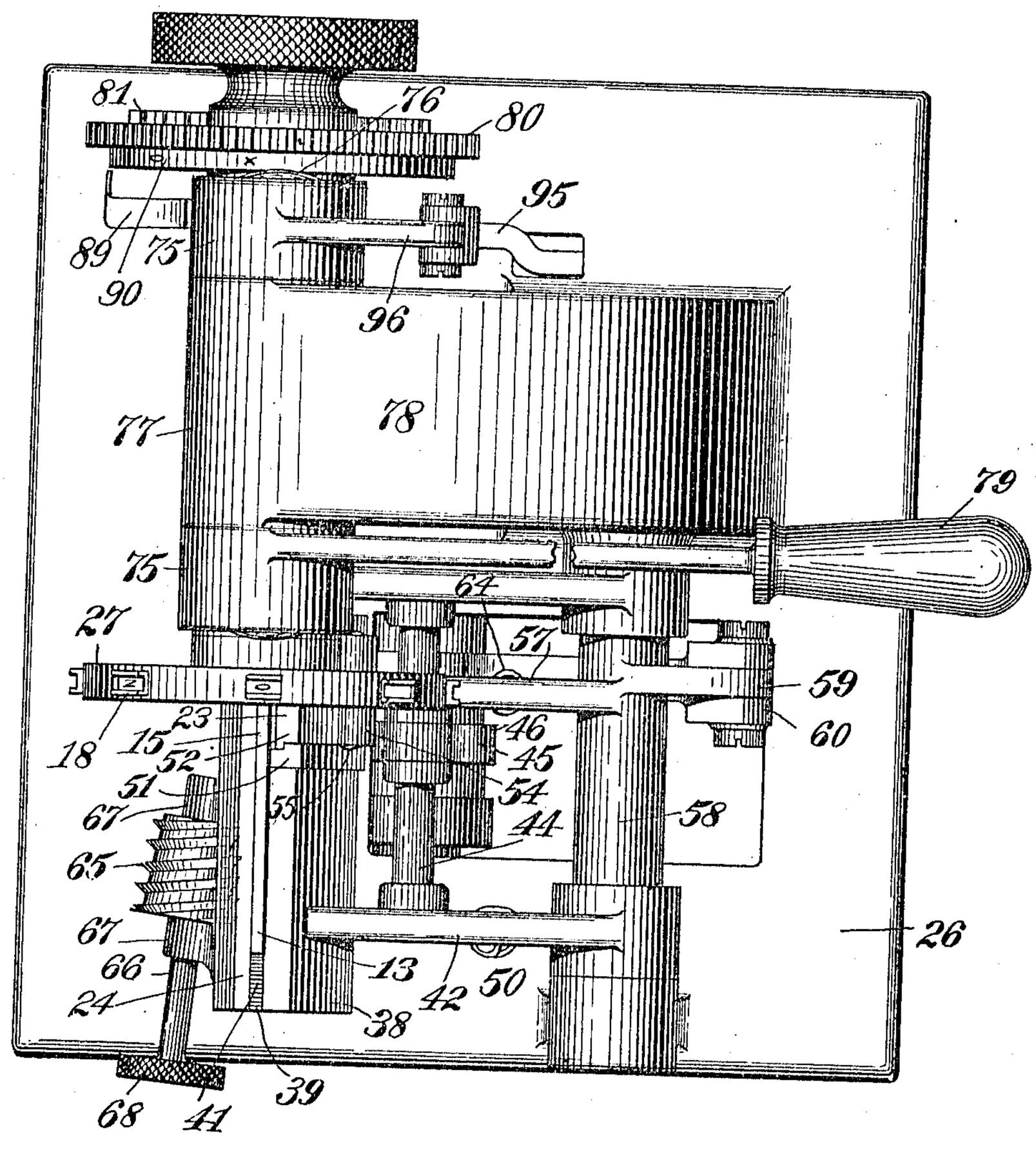
7 SHEETS—SHEET 7.

Fig. 11.



Witnesses
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R. H. Pittman

Inventor:
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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AMERICAN TYPOGRAPHIC CORPORATION, A CORPORATION OF ARIZONA TERRITORY.

ART OF PRODUCING TYPE-BARS.

947,350. Specification of Letters Patent. Patented Jan. 25, 1910.

Application filed March 11, 1903, Serial No. 147,218. Renewed June 5, 1909. Serial No. 500,406.

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in the Art of Producing Type-Bars, of which the following is a specification.

This invention relates to the art or method of forming or producing typebars.

In the production of typebars from blanks it is desirable that the printing or impression face of the types produced upon the blank should be true and accurate and that the displacement of the material of the blank should be localized as much as possible whereby such displacement will not affect the blank generally but will be controlled and centralized at the region worked upon.

In the present improvement a die is placed contiguous to the blank and the blank forced toward the die, and at the same time the portion of the blank immediately acted upon by the die is forced at a greater or accelerated speed than the other portions of the blank, whereby although the blank is pressed down or crushed to a certain extent at the region of the type head, yet such displacement or breaking down is not imparted to the blank generally but is compensated for by the localizing pressure which causes the flowage of the material of the blank in the direction opposite to which the flowage normally produced by the die would take place. In some instances it may also be found desirable to impart a third movement and produce a relative oscillation between the blank and die, which in certain instances will tend to produce a finer face upon the type or impressions produced.

In the drawings accompanying and forming part of this specification, Figure 1 illustrates a mode of carrying out my invention and shows the first step, Fig. 2 is a view similar to Fig. 1 showing a step further advanced. Fig. 3 is a perspective view of a logotype, the product of this method, Fig. 4 is a cross section of the same, Fig. 5 is a perspective view of a number of typebars produced according to this method arranged within a chase, Fig. 6 is an end elevation, partly broken away, showing a form of apparatus which may be employed in the mechanical carrying out of this invention, Fig. 7 is a front view thereof, parts shown in cross section, Fig. 8 is a top view thereof, and Figs. 9, 10 and 11 are similar views of a somewhat different form of apparatus.

A convenient form of blank, designated in a general way by 13, is illustrated herein, which comprises a body portion 14 having an offset end or edge 15, two shoulders 16, 17 being produced upon the respective sides of the blank by the offsetting of the edge 15. When it is desired to employ such a blank in the production of a type a suitable die 18 will be employed, which will be brought into pressing contact with the offset edge 15 and during the pressure, which if desired may be applied to the body portion 14 of the blank, pressure will be exerted upon the face 17, whereby the material of the blank will be forced into the cavity of the die and will be displaced from the body of the blank toward the face or type head to a greater degree than the displacement of the face toward the body. The result of such operation will leave a finished product substantially as shown in Figs. 4 and 5, wherein there will be a head 19 having a type face 20 thereon. The shoulder 16 will remain substantially intact and the face 17 will have given way to become the face 21, a notch or channel 22 being produced by the close application of a die 23 employed in the pressing operation. For the purpose of maintaining the shoulder or face 16 intact an anvil 24 may be employed. After the pressing certain burs 25 will be found upon the head, which may be removed in any convenient manner.

In Fig. 3 a logotype is shown, having been produced by the use of a number of different dies, and in Fig. 5 a number of typebars having been similarly produced are shown assembled. It being apparent that the face 21 of one bar will rest upon the face 16 of an adjacent bar, whereby the heads will not be bent, but will be securely supported and the bars will be interchangeable, but non-reversible, so that it will be absolutely impossible to make up a form and have any of the types upside down.

So far as has just been described the method may be carried out by hand and dur-

ing the advance of the blank body and the auxiliary advance of the portion acted upon the die may be oscillated for reasons which are well known in the production of impressions from dies having cavities. For commercial reasons, however, it is frequently found practical to employ some mechanical assistance in carrying out this process of producing bars, which mechanism is shown as mounted upon a frame 26. The dies 18, eight of which are illustrated in the present instance for convenience, are mounted upon a carrier 27 which is supported by a shaft 28. The shaft 28 is shown as mounted in an elongated bearing 29 carried by an arch 30 from the machine frame and as provided with a knurled head 31 for use in adjusting the carrier to locate the chosen die at the working position. The carrier is provided with a hole or recess 32 corresponding to each die, and mounted upon the journal 29 is a standard 33 carrying an elongated sleeve-like journal 34 in which is a bolt 35 organized to engage the holes or recesses 32, which bolt is provided at its end with a handle 36 for the purpose of withdrawing the same. Some suitable means, here shown as a spiral spring 37 engaging a head on the bolt and located within the bearing 34, may be employed for returning the bolt to its locked position.

The blank 13 is in the present instance shown as supported by a blank-holder 38 having a groove 39 constituting a pocket for receiving the major portion or body 14 of the blank. At the edge of such groove the walls thereof are shown as inclined toward one side so that there is provided an overhanging wall or face 40 corresponding to the anvil 24 shown in Fig. 2 and a wall or face 41 sloping away from the groove. Such shaped groove will be organized to accommodate a blank which has a bend in it lengthwise to accommodate the faces 16 and 17 incident to the offset of the edge portion 15. The holder in the present instance is mounted upon a pair of arms 42 which are mounted upon a shaft 43 supported upon the machine frame. For the purpose of advancing the blank toward the die a pivot shaft or bar 44 is shown as connecting the arms 42, to which is pivoted a link 45 having a forked end 46 provided with a roll 47 running upon the face of a cam-wheel 48 upon a driver-shaft 49, whereby upon the rotation of the driver-shaft the blank-holder and blank will be advanced toward the die-carrier and upon a sufficient advance of the holder the blank will be squeezed against the die and the material thereof forced into the cavities of the die. A suitable spring 50 may be employed for returning the carrier to its idle position upon the roll 47 running down the fall or drop face of the cam.

The holder is shown as provided on its side with ways 51 in which is mounted a slide 52 carrying the plain die 23 upon its upper edge, and which die is provided with a shoulder 53 organized to abut the side of the type head and justify the same. The ways 51 are shown at an angle to the groove 39. Upon the end of the slide 52 opposite the die is a pair of eyes 54 receiving a pivot pin 55 which passes through an elongated opening 56 in an arm 57 carried by a sleeve 58 surrounding the shaft 43, to which sleeve is also secured an arm 59 constituting with the arm 57 a lever, and the arm 59 being shown as the short arm of such lever, to which arms 59 is pivoted a link 60 having a yoke 61 embracing the driver-shaft and carrying a roll 62 running upon a cam 63 fast upon the driver-shaft.

The advance of the die 23 will be faster than the advance of the blank-holder and in the present organization at a constant ratio, although if desired the advance of the die may be at an accelerated speed to the advance of the blank-holder. The principal part of the advance of both will take place at the same time, the cams, however, are so timed that the die 23 will be withdrawn from independent pressing just prior to the withdrawal of the blank from the forming die. The die 23 will engage the offset portion or under face 17 and press it against the overhanging wall 40 constituting the anvil 24 and against the forming die. The shoulder 53 will control one side of the type head and justify the same. Suitable means, here shown as a spiral spring 64, may be employed for returning the parts to their normal position.

Suitable means may be employed for advancing the blank after each impression, that is if more than one impression is to be produced upon the blank, which means is, in the present instance, shown as a feed screw 65 mounted upon a shaft 66 having bearings 67 carried on the blank-holder. The shaft 66 is provided with a knurled head 68 for the purpose of rotating the screw to advance the blank.

The driving shaft 49 may be rotated by any convenient means, here shown as a hand crank 70 mounted upon a shaft 71 having suitable bearings in the frame of the machine and provided with a spiral gear-wheel 72 meshing with a corresponding spiral gear-wheel 73 fast upon the shaft 49.

In some applications it may be desirable in fashioning the blank to impart a relative oscillation between the blank and die, to carry out which feature the device illustrated in Figs. 9, 10 and 11 will make the same possible. In this instance the shaft 28 will have its elongated bearing 29 carried by arms 74 which are shown as provided with hubs 75 embracing a shaft 76 supported

by a bearing 77 carried by a horn 78 rising from the machine frame, which corresponds to one side of the arch 30 in the other instance. One of the hubs 75 is shown as provided with a hand lever 79, and mounted upon the shaft 28 is shown a spur-wheel 80 and adjacent to such spur-wheel is a sector 81 normally constituted to mesh with such spur-wheel. The sector is shown as mounted upon a rocker 82 pivoted at 83 to eyes 84 of the machine frame. The rocker is provided with a handle 85 for moving it into and out of mesh with the gear-wheel 80, it being necessary to move it out of gear upon the locating of a chosen die. The rocker is provided with a back stop 86 for engaging a plane face of the machine frame to limit the movement of the sector and hold it steadily at its working position, which back stop is provided with a pair of pins 87 engaging a leaf spring 88 for returning the sector to its active position and holding the back stop against the face of the machine frame. One of the arms 74 is provided with a pointer 89 registering with exponents 90 carried by a flange 91 on the gear-wheel or upon the shaft which will indicate the location of a selected die. By this organization the die may be oscillated during the pressure of the blank against it, so that the formation of the impression upon the blank may be more complete. In this instance the driving-shaft 49 is organized to be driven by means controlled by the oscillating device to the end that in the formation of each impression the die will be given the same number of oscillations as for every other impression, to which end a ratchet-wheel 92 is secured to the driving-shaft 49 and a pawl 93 is carried by an arm 94 having one end surrounding the driving-shaft and the other end pivoted to the link 95 which is pivoted to an arm 96 carried by one of the hubs 75. A suitable spring 97 may be employed for holding the pawl in engagement with the ratchet. Upon each depression of the hand-lever 79 in giving an excursion to the die the pawl will be fed idly over the ratchet and upon raising the hand lever to give the die an excursion in the opposite direction the pawl will rotate the ratchet-wheel and cause the advance of the drivers, in the present instance the cams, and cause the same to perform their work. By this organization the advance of the blank, both the normal advance or the entire blank and the auxiliary advance or displacement of a portion thereof, will be step by step, and one excursion of oscillation will be while the blank remains in a temporarily stationary position and the reverse excursion of oscillation will be while both such advances are taking place.

The machinery herein illustrated is shown as manually controlled and driven, yet it will be apparent that the present mode of producing types may be employed and carried out in machines mechanically controlled and power driven.

Having thus described my invention, I claim—

1. The art of producing types which consists in pressing a blank toward a die and applying additional pressure to the blank at a point contiguous to the die.

2. The art of producing types which consists in pressing a blank and die together, and displacing a portion of the blank toward the die and in advance of the stage to which such portion of the blank would advance with the whole blank.

3. The art of producing typebars which consists in pressing an offset edge of a blank against a die, and pressing the portion of the blank adjacent to the die in a line at an angle to the line of general pressure.

4. The art of producing types which consists in pressing the edge of an offset portion of a blank against a die, advancing the blank against the die, and advancing at a greater speed a portion of the blank directly affected by the die.

5. The art of producing types which consists in working a blank toward a die under pressure, and applying additional pressure to the blank at a point contiguous to the die.

6. The art of fashioning blanks which consists in displacing the material of the edge of a blank toward the body thereof by a forming die and controlling the extent of the displacement by displacing the material of the blank toward the forming die in the region of the displacement effected thereby.

7. The art of forming typebars which consists in forcing a blank toward a die and at about the same time forcing a portion of the blank out of its normal position and against the die.

8. The art of producing typebars which consists in pressing a die and blank into engagement thus displacing the blank and at the same time displacing a portion of the blank in a counter direction.

9. The art of producing typebars which consists in pressing a die and blank into engagement, partly displacing the metal of the blank in a direction away from the die, and counteracting such displacement by a local displacement of metal toward the die at the same time.

10. The art of producing typebars which consists in pressing a die and blank into engagement by a step-by-step advance, partly displacing the metal of the blank in a direction away from the die, and counteracting such displacement by a local displacement of metal toward the die at each step.

11. The art of producing typebars which consists in advancing a blank toward a die step-by-step, producing relative oscillations

between the blank and die, the excursions of which oscillations in one direction take place during the advance step and the return excursions during the intervals between steps.

12. The art of producing typebars which consists in pressing a blank against a die by a series of step-by-step advances combined with oscillations, the excursions of which in one direction take place during the advance step and the return excursions during the intervals between steps, and displacing a portion of the blank adjacent to the die step-by-step contemporaneously with the advance of the blank.

13. The art of producing types which consists in pressing a blank and die relatively one to the other, and applying additional pressure to the blank at a point contiguous to the die.

14. The art of producing types which consists in pressing the work and working member together, and displacing a portion of the work toward the working member in a line at an angle to the line of working pressure, and in advance of the position to which such portion of the work would normally be advanced.

15. The art of producing typebars which consists in pressing the offset edge of a blank and a die together, pressing a portion of the blank adjacent to the die in a line at an angle to the line of general pressure, and applying additional pressure.

16. The art of producing types which consists in pressing the edge of an offset portion of a blank and a die together, advancing one member against the other, and advancing at a greater speed a portion of the blank directly acted upon by the die.

17. The art of producing types which consists in applying pressure between a blank and a die, advancing one member relatively to the other, and applying additional pressure to a portion of the blank at an angle to the line of advance.

18. The art of producing types which consists in applying pressure between a blank and a working member, advancing one element against the other, and applying additional pressure to a portion of the blank and at an angle to such line of advance.

19. The art of producing types which consists in applying pressure between a blank and a die in the general plane of one of the members, and applying additional pressure to a portion of the blank transverse to such general plane.

20. The art of producing typebars which consists in pressing a die and a blank into engagement, relatively displacing the metal of the blank in the direction transverse to the line of the die, and counteracting such displacement by the local displacement of the metal in a line with the die at the same time.

21. The art of producing types which consists in applying pressure between a blank and a die, advancing one member relatively to the other, and applying additional pressure to a portion of the blank transverse to such general line of advance.

22. The art of producing type-bars which consists in pressing a die and a blank into engagement, advancing the die and blank, relatively displacing the metal of the blank in the direction transverse to the line of the die, and counteracting such displacement by the local displacement of the metal in a line with the die at the same time.

23. The art of producing typebars, which consists in pressing a die and a blank into engagement by a relative step by step advance, relatively displacing the metal of the die in one direction transverse to the die, and counteracting such displacement by the local displacement of the material in the line of the type at each step.

24. The art of producing typebars which consists of working a blank toward the die step by step relatively producing the relative movements between the members, the movements of which in one direction take place during the advance step and the return excursions during the intervals between the steps.

25. The art of producing types which consists in pressing a blank and die relatively and applying additional pressure to the blank in the region of the die.

26. The art of producing types which consists in pressing a blank and die together, and displacing a portion of the blank in advance of a stage in which such portion of the blank would advance with the whole blank.

27. The art of producing typebars which consists in pressing an edge of a blank against a die, and pressing the portion of the blank adjacent to the die in a line at an angle to the line of general pressure.

28. The art of producing types which consists in pressing the edge of a portion of a blank against a die, advancing the blank against the die, and advancing at a greater speed a portion of the blank directly effected by the die.

29. The art of producing types which consists in applying pressure between a blank and a die, causing a relative advance of the members and applying additional pressure to a portion of the blank at an angle to such general line of advance.

30. The art of fashioning blanks which consists in displacing the material of a blank by a forming die, and controlling the extent of the displacement by displacing the material of the blank toward the forming die in the region of the displacement effected thereby.

31. The art of forming typebars which

consists in forcing a blank toward a die and at about the same time forcing a portion of the blank out of its normal position and against the die, and causing an advanced movement of one relatively to the other.

32. The art of producing typebars which consists in causing a relative pressure of a die and a blank with a tendency to displace the blank and at the same time displacing a portion of the blank in a counter direction.

33. The art of producing typebars which consists in pressing a die and blank into engagement causing an advance of one relatively to the other displacing the metal of the blank in a direction away from the die, and counteracting such displacement by a local displacement of metal toward the die at the same time.

34. The art of producing typebars which consists in pressing a die and blank into engagement by a step-by-step advance, causing an advance of one relatively to the other, displacing the metal of the blank in a direction away from the die, and counteracting such displacement by a local displacement of metal toward the die at each step.

35. The art of producing typebars which consists in advancing a blank toward a die step-by-step, producing relative oscillations between the blank and die which oscillations in one direction take place during the advance step and the return excursions during the intervals between the steps.

36. The art of producing typebars which consists in pressing a blank against a die by a series of step-by-step advances combined with oscillations, the excursions of which in one direction take place during the advance step and the return excursions during the intervals between steps, and displacing a portion of the blank adjacent to the die step-by-step contemporaneously with the advance of the blank.

37. The art of fashioning an offset blank which consists in pressing the offset portion of the blank against the die causing an advance of one relatively to the other and at the same time applying pressure to the offset portion tending to partially overcome or eradicate the offset.

38. The art of producing typebars which consists in advancing a die and blank one relative to the other and in squeezing the worked upon portion of the blank against the die.

39. The art of producing typebars which consists in advancing a blank toward a die and concurrently squeezing the worked upon portion of the blank against the die in a direction at an angle to the blank advance.

40. That improvement in the typographic art which consists in advancing a blank toward the die, and supplying pressure to the blank to accelerate the advance of a portion thereof.

41. That improvement in the typographic art which consists in advancing a blank toward the die, applying pressure to the blank to accelerate the advance of a portion thereof, and in interposing a thrust face in the line of displacement of such acceleration.

42. That improvement in the typographic art which consists in advancing a blank toward a die imposing an anvil face against the side of the blank and causing a displacement of the metal of the blank toward the die and anvil.

43. That improvement in the typographic art which consists in bringing a blank and die into type formative relation and coincidently applying pressure to a portion of the blank for squeezing the same against the die and against the fixed face upon the opposite side of the blank.

Signed at Nos. 9–15 Murray street, New York, N. Y., this 9th day of March, 1903.

FRANCIS H. RICHARDS.

Witnesses:
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