

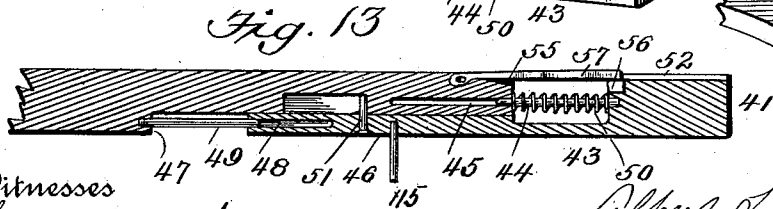
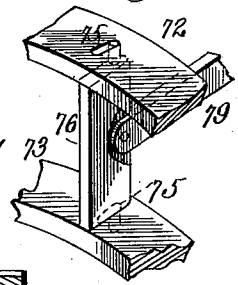
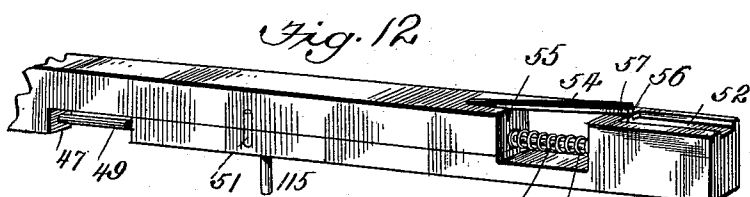
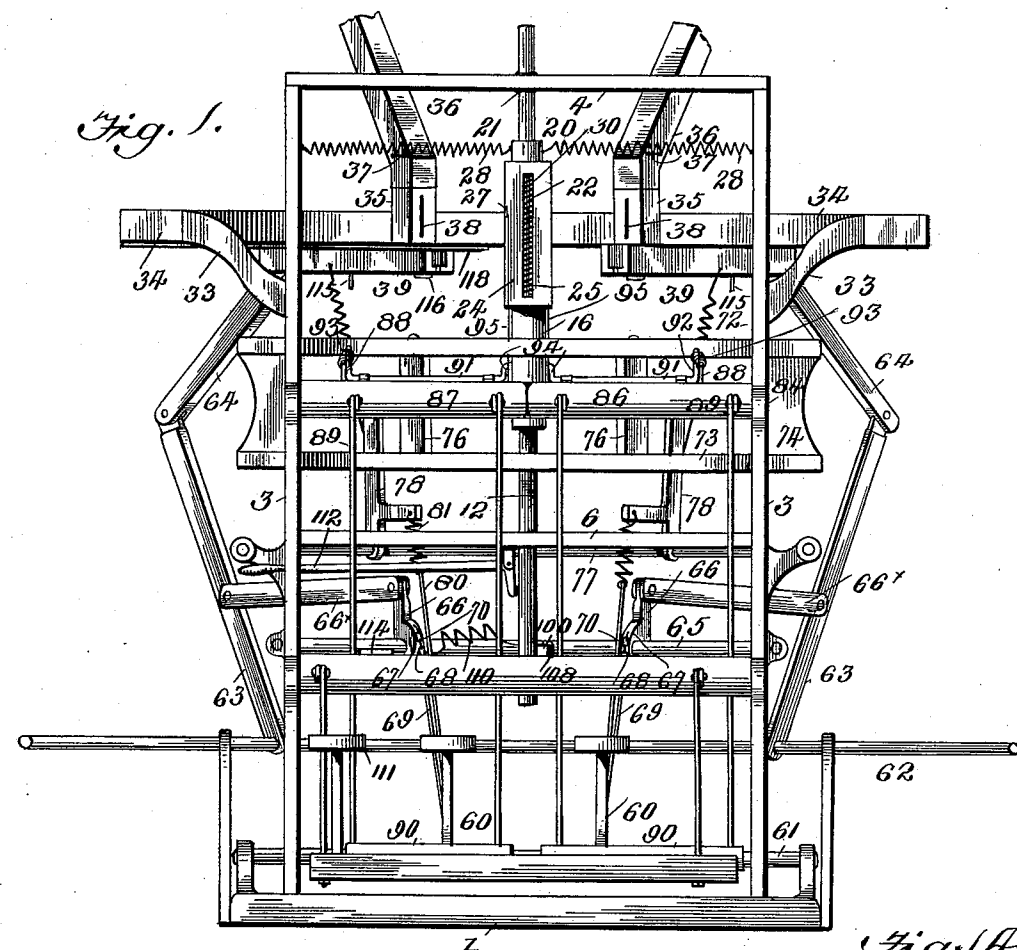
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5 Sheets—Sheet 1.

A. S. HOGE.
TYPE SETTING MACHINE.

No. 540,914.

Patented June 11, 1895.



Inventor

Witnesses 47 48 49
Thomas Durant
Wallace Mulock

45 50
Albert S. Hoge
by Frank D. Johns
Attorney

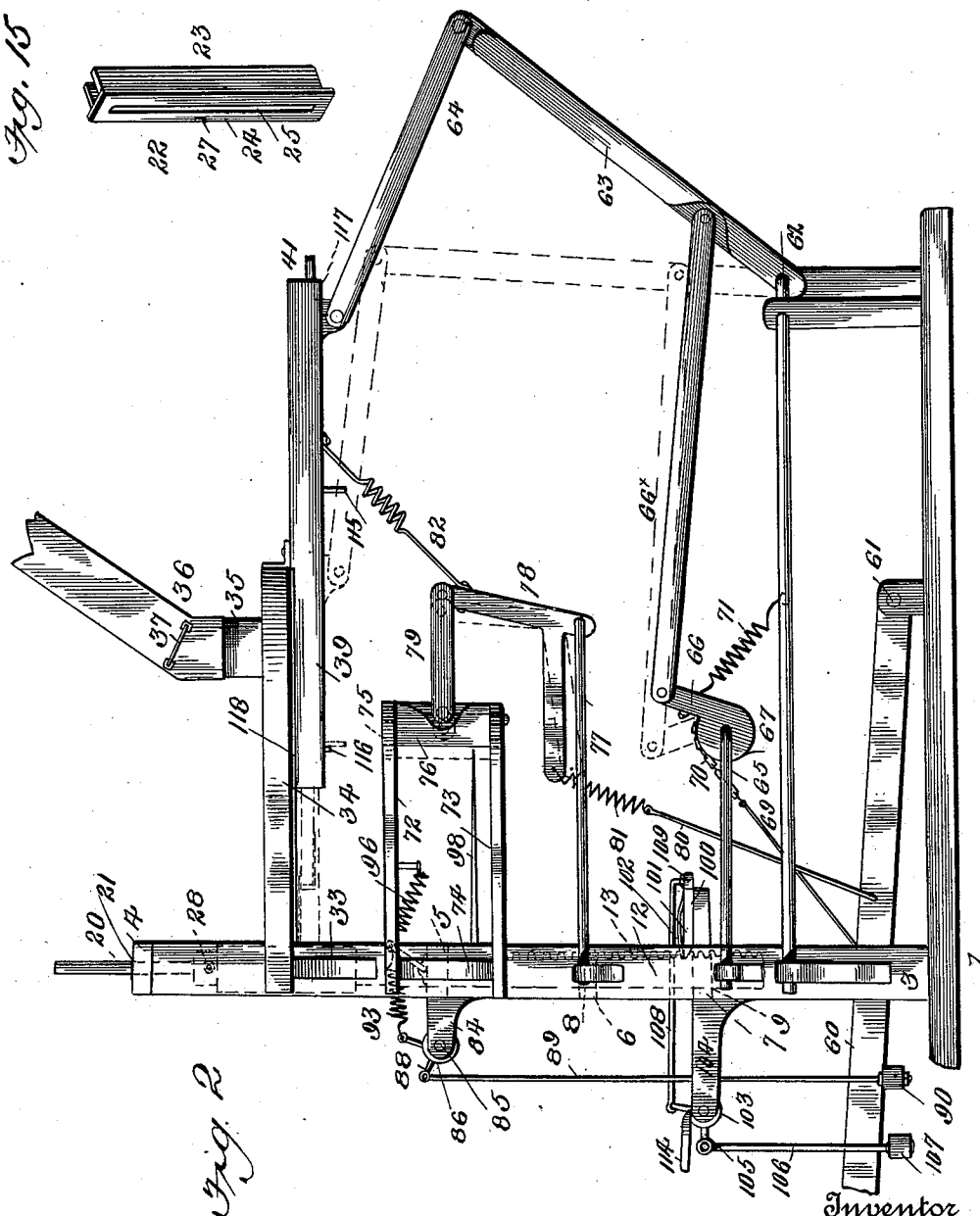
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5 Sheets—Sheet 2.

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Witnesses

Johnnie
Thomas Durant

Inventor

Albert J. Hoge
by Frank W. Johnson
Attorney

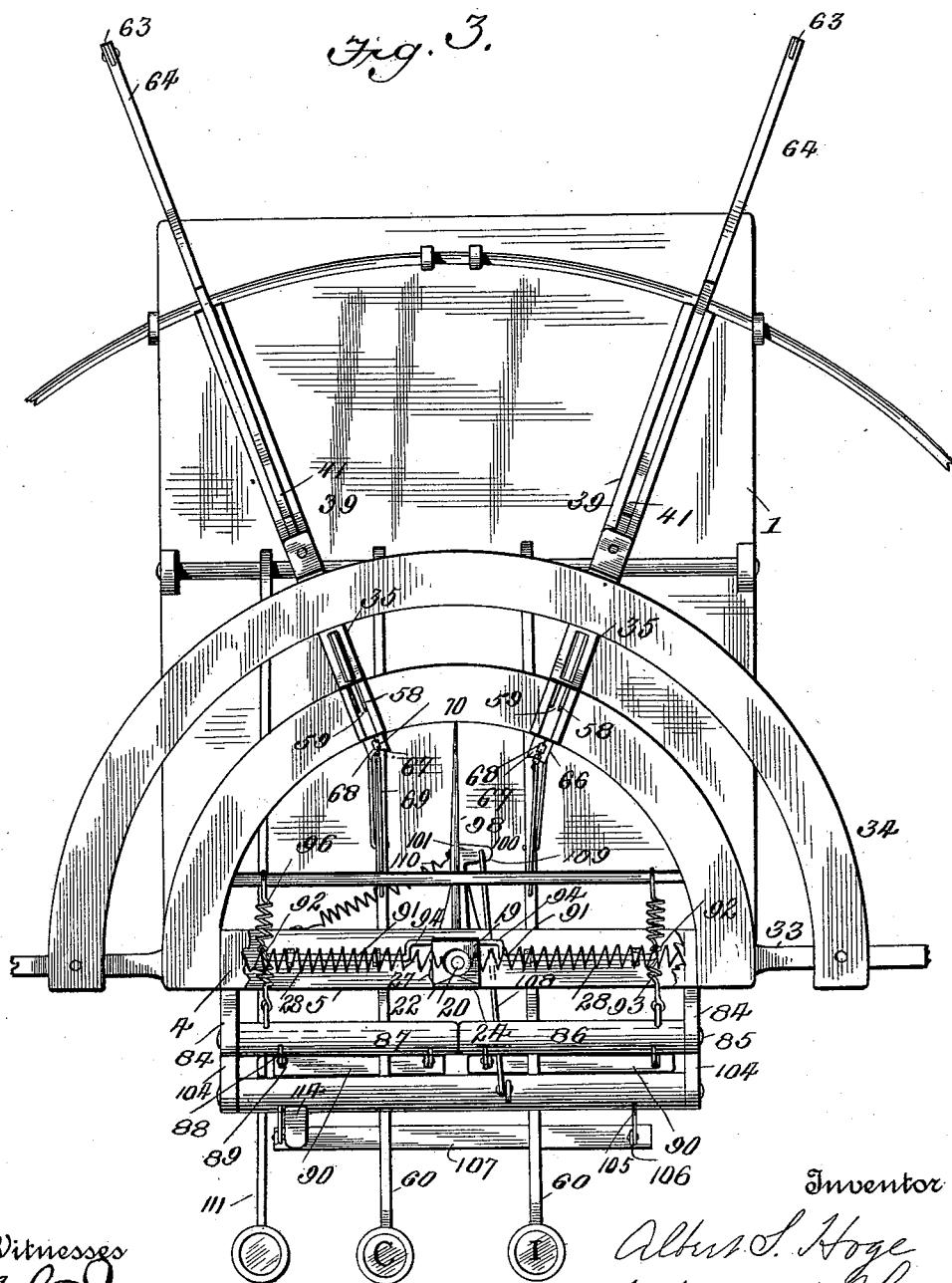
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5 Sheets—Sheet 3.

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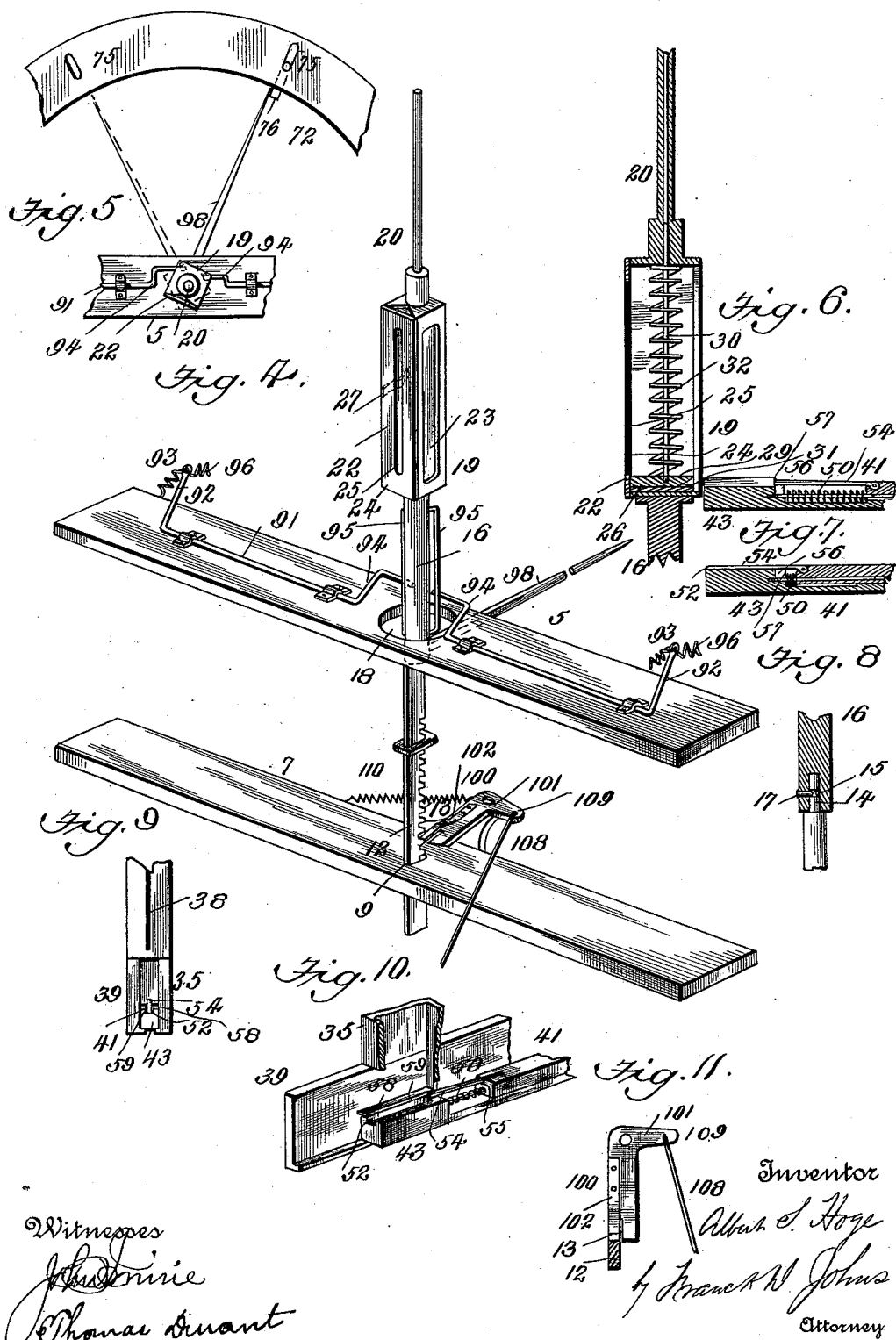
Witnesses
John D. Smith
Thomas Durant

Inventor
Albert S. Hoge
by *Frank W. Jones*
Attorney.

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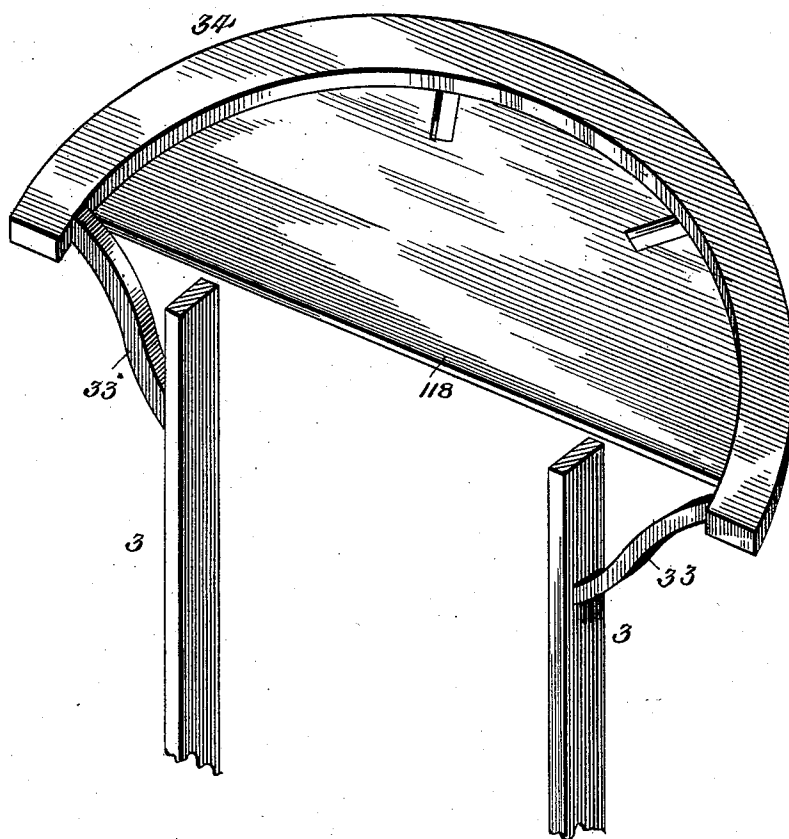
5 Sheets—Sheet 5.

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No. 540,914.

Patented June 11, 1895.

Fig. 16.



Witnesses
John D. Murre
C. J. Bell

Inventor
Albert S. Hoge
By *Frank D. Jones*
Attorney

UNITED STATES PATENT OFFICE.

ALBERT S. HOGE, OF WISE, VIRGINIA, ASSIGNOR OF ONE-HALF TO EMORY E. HOGE, OF WASHINGTON, DISTRICT OF COLUMBIA.

TYPE-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,914, dated June 11, 1895.

Application filed January 25, 1895. Serial No. 536,237. (No model.)

To all whom it may concern:

Be it known that I, ALBERT S. HOGE, a citizen of the United States, residing at Wise, in the county of Wise and State of Virginia, have
5 invented certain new and useful Improvements in Type-Setting 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
10 appertains to make and use the same.

My invention relates to certain improvements in type setting machines and has for its object to produce a simple and effective machine for setting type with which any of
15 the ordinary forms of type, now in general use, may be set or with which a type especially manufactured for the machine may be used.

My said invention consists in certain novelty in the construction, arrangement and combination of the various parts of the same,
20 all of which I will now proceed to point out and describe, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a machine embodying my invention, parts of the same being omitted. Fig. 2 is a side elevation of the same; Fig. 3, a top plan view; Fig. 4, a detail in perspective of part of the mechanism for operating the "stick" or receiving device in which the type is set. Figs. 5, 6, 7, 8,
25 9, 10, 11, 12, 13, 14, 15, and 16 are further details of various parts of my said invention.

I would here state that each character of a font of type is provided with a separate hopper and separate mechanism for conveying the type from its hopper to the "stick" or receiving device and setting the same therein and that each set of operating mechanism is
35 provided with an individual key and operating lever. In order, therefore, to simplify the drawings, I have only shown two of the hoppers and the necessary operating mechanism connected with said hoppers.

45 I would further state that certain of the parts of the machine, such, for instance, as the hoppers and the type carrying and setting mechanism, are shown on an enlarged scale to more clearly illustrate the same and are out of

proportion to the frame and other parts of the machine.

Referring to said drawings, the numeral, 1, represents a suitable base. Secured at right angles to said base and projecting above the frame are a pair of vertical uprights, 3,
55 connected at their upper ends by a horizontal cross-bar, 4, and also connected by horizontal cross-bars, 5, 6 and 7. At the center of the cross-bars, 6 and 7, I form rectangular bearings, 8 and 9, registering with and in a
60 vertical line with each other. 12 is a vertical rack bar mounted in said bearings and adapted to be moved vertically in said bearings, but not to turn therein. On its inner face the bar, 12, is provided with a rack, 13, hav-
65 ing its teeth of uniform size, and on its upper end with a spindle, 14, having an annular groove, 15.

16 is a vertical shaft mounted on the spindle on the upper end of the rack bar, 12, and
70 secured thereto by a pin, 17, engaging the annular groove, 15. Said shaft is thus capable of a partial revolution on its spindle and at the same time moves vertically as the rack bar is operated, as hereinafter described. 75
The shaft, 16, passes through an aperture, 18, in the cross-bar, 5, and has secured to its upper end a rectangular frame, 19, having on its upper end a vertical hollow rod, 20, passing through a bearing, 21, in the upper cross-
80 bar, 4.

22 is a "stick" or receiving box which receives the type and in which the said type is set one upon the other until a line is formed or sufficient matter set up to be transferred
85 to the galley. Said stick is preferably a rectangular box having two parallel sides, 23, a back, 24, provided with a slot, 25, through which the face of the type may be seen, and a bottom, 26; the top and front of the "stick" 90
or receiver being open and its said open front facing the type hoppers. This "stick" is made to fit snugly within the frame, 19, and is held therein by a spring, 27. The space between the sides of the stick is of sufficient width to
95 receive a line of type one upon the other, and, when placed in the frame, its longitudinal center is on a line with the vertical center

line, of the rack bar, vertical shaft and frame. The "stick" or receiving box is thus located in the vertical center line of the front of the machine with its open front toward the center of said machine.

28 are springs of equal strength connecting the opposite sides of the frame with the uprights, 3. These springs hold the open front of the "stick" or type receiver normally toward the center of the machine, but permit the frame and stick to be turned to the right or left, and also operate to return said frame and "stick" to their normal position.

29 is a flat type guard secured to the lower end of a rod, 30, passing through the hollow rod, 20. Said type guard has its outer end bent or beveled upward as at 31, and is held down upon the type as it is deposited in the "stick" by a spring, 32. As the type is deposited in the "stick" one upon the other the guard is raised to accommodate said type which are readily forced in under the beveled outer end of said guard, the guard serving to hold the type as set, and prevent them from being displaced as the machine is operated.

33 are brackets attached to the upper portion of the uprights, 3, on which is secured a substantially semicircular horizontal support, 34. Said support is formed on the arc of a circle having its center in the vertical center line of the front of the machine and thus also in the vertical center of the "stick" when the same is in position.

Mounted on the support, 34, and arranged in a semicircle are a series of vertical type hoppers, 35, a hopper being provided for each character that is used in a font of type. As before stated, in the drawings only two of these hoppers are shown and these are on an enlarged scale, in order to more clearly illustrate the same. Said two hoppers are arranged in the drawings on opposite sides of the center of the support. In practice they would substantially abut against each other and form a continuous semicircle from one side of the machine to the other, radiating from the "stick" or receiving box. The hoppers are made of sufficient size, in cross section, to accommodate a single type lying flat on its side and permit the same to pass through and be discharged from the hopper in this position. The type are placed in the hopper one upon the other with the face pointing toward the front of hopper or center of the machine. Said hoppers extend but a short distance above the support and are fed by removable inclined chutes, 36, of the same size in cross section as the hoppers. A neat joint is made between the hoppers and chutes so that the type will readily pass from one to the other by gravity alone.

37 is a valve or cut-off to stop the supply of type which is open when the machine is in operation, but is closed when the chutes are removed for the purpose of loading the same.

The chutes are first loaded with the type lying flat on their sides with all the faces in

the same direction. This is done automatically by mechanism which will be made the subject-matter of another application.

The chutes are supported in any suitable manner, which is not necessary to be shown. Said chutes, being inclined, greatly relieve the pressure upon the machine and at the lower discharge end of the hopper.

38 are slots or openings in the front of the hopper through which the type may be seen and the quantity of type in the hopper noted.

39 are ways secured to the support, 34, immediately below the hoppers and radiating from the center of the circle in which the hoppers are arranged, a way being provided for each hopper. In each way is mounted a slide, 41, adapted to be moved back and forward in said ways. The slides are provided with a telescopic end, 43, forming the type carrier which is of the same size in cross section as the slide and secured to the forward end of said slide by a rod, 44, mounted in a longitudinal bearing, 45, in the slide, and an arm, 46, engaging a longitudinal recess, 47, on the underside of the slide and provided with longitudinal bearings, 48, engaged by a guide rod, 49, secured to the slide.

50 is a spring which holds the type carrier normally away from the end of the slide; 51, a pin engaging a longitudinal slot in the slide to limit the outward movement of the type carrier.

52 is a longitudinal recess or type seat in the upper face of the type carrier. Said recess or type seat is of sufficient depth, width and length to accommodate the size of the particular type coming from the hopper with which each slide is connected.

54 is a spring type ejector having its rear end secured to the end of the slide and flush with the upper surface of said slide and its forward end resting normally in a slot, 55, in the type carrier and extending into the rear of the recess or type seat of said carrier. When the machine is in its normal position, the type seat or recess is directly under the lower discharge end of the hopper, the forward end of the spring ejector resting in vertical slot, 56, in the rear wall, 57, of the hopper, which slot is of sufficient size to permit the said spring ejector to pass therethrough, but not to allow a type to be carried back of the hopper. Said rear wall also extends lower than the forward wall for a similar purpose.

58 are forwardly and downwardly inclined guides secured to the way directly under the discharge end of the hopper and upon which the type fall and rest as they leave the hopper. A slot, 59, is formed between said guides of sufficient size to permit the spring ejector to pass.

60 are the key levers, a lever being provided for each hopper and its slide and designated by a suitable character upon the key, corresponding to the character of the type in each particular hopper. These keys may be arranged in any suitable manner, in banks, or

other well known form, and project in front of the machine. Said levers are pivoted to a rod, 61, supported on the base of the machine.

62 is a semicircular rod concentric with the line of hoppers and suitably supported from the base and uprights, 3. 63 are a series of levers pivoted at one end to said rod and connected with the type slides by pivoted links, 64.

65 is a smaller semicircular rod concentric with the rod, 62, and supported from the uprights, 3.

66 are levers pivoted on the rod, 65, and connected with the levers, 63, by links, 66. The lower ends of the levers are rounded as shown at 67 and provided with a groove, 68. Said levers are also connected with the key levers by links, 69, and chains, 70, which rest in the grooves, 68.

71 are springs which return the levers and slides to their normal position when the key levers are released.

By the mechanism thus described the type carrying slides are operated.

72 and 73 are two semicircular horizontal bars or supports secured to brackets, 74, on the uprights, 3.

75 are a series of elongated radial bearings formed in the bars of 72 and 73 and registering vertically with each other.

76 are a series of radially movable stops mounted in the bearings 75, and arranged in a semicircle concentric with the circle of the hoppers. A stop is provided for each hopper and said stops are located in the same radial line as its hopper and below the same.

77 is a semicircular rod supported by the uprights, 3, and on which are pivoted bell crank levers, 78, connected with the stops at their upper ends by links, 79, pivoted at one end to the stops and at their other ends to the upper arm of the bell crank lever, the lower arm of said lever being connected to the particular key lever, of the hopper above said stop, by a link, 80, and spring, 81. The stops normally are held back out of action by springs, 82. When the key lever of a given hopper is operated, the stop for said hopper is moved forward toward the center of the machine by its lever connections with said key lever, the spring, 81, being of sufficient strength to pull the stop forward to the limit of its movement on any slight depression of the key lever moving the stop forward. When its movement is checked, the spring, 81, expands as said key lever is depressed, and permits it to continue its stroke. When the key lever is released, the spring, 82, returns the stop to its normal position. The object of said stops will be more fully hereinafter set forth.

84 are brackets on the uprights, 3, and projecting in front of the machine. 85 is a horizontal rod secured to said brackets and extending at right angles to the length of the key levers. 86 and 87 are two rock shafts mounted on said rod, said shafts being of

equal length and in a line with each other. 88 are lever arms projecting from each rock-shaft and all at the same angle. 89 are depending links from each lever arm, each pair of links being connected by a lever bar, 90, extending under the key levers, one being engaged by one-half of the entire number of key levers which operate the one-half of the hoppers on the right of the machine, and the other bar by the rest of the key levers which operate the hoppers on the left of the machine.

91 are two similarly formed counter rock-shafts mounted on the cross-bar, 5, on diametrically opposite sides of the vertical shaft carrying the "stick" frame. Said shafts are provided at their outer ends with lever arms, 92, connected to the lever arms, 88, on the rock shaft by springs, 93. The inner ends of said lever arms are provided with bell crank levers, 94, which, when either of the shafts, 91, are rocked, engage wings, 95, on the shaft carrying the "stick" frame and turn the same to the right or the left according to which shaft is turned. 96 are springs which return the rock-shafts to their normal position when the key levers are released.

98 is a stop arm formed on the shaft, 16, and projecting radially therefrom in a vertical plane taken through the vertical center line of the "stick" or receiving box. Its outer end moves, as the said shaft, 16, is turned, in the arc of a circle within which the stops would project when operated. Now, when a given key lever is depressed through the mechanism described, the shaft, 16, is turned, also turning the "stick" or type box toward the hopper of the key lever operated, the stop of said hopper is moved forward and the stop arm, 98, engages said stop holding the open side front of the stick directly opposite said hopper ready to receive the type. Any slight movement of the key lever causes this action, and as the lever is still further depressed the spring connection, 93, expands and permits the rock-shaft, 88, to still further turn and the key lever to continue its stroke. It will, of course, be understood that one set of levers turns the "stick" to the right, the other to the left. Only the stop of the hopper from which the desired character is to be taken being operated, the "stick" is forced to face directly in a line with the hopper and receive the type as it is brought therefrom.

When the machine is started and the stick empty, it is raised so that its bottom will be in the horizontal plane of the bottom of the type carrier. The first type having been forced into the hopper it is necessary to drop the same so that the plane will be lowered and the next type deposited on top of the type last placed in said stick. To accomplish this I employ the following escapement or feed mechanism, consisting of a pivoted pawl, 100, having a solid member, 101, and a spring member, 102, a horizontal rock-shaft, 103, mounted in brackets, 104, secured to the up-

rights, 3, and provided with lever arms, 105, having depending links, 106, connected by a lever bar, 107, extending under the key levers and engaged thereby as the key levers are depressed and thus rock the shaft, a link, 108, connecting the pawl with a lever arm, 109, projecting from the rock-shaft. In its normal position the spring member of the pawl engages a tooth of the rack, and the weight of the same depresses the spring so that the rigid member of the pawl is on the same plane and as the key lever is operated the rigid member enters said tooth and holds the rack and "stick" carried by the same until the type has been deposited. The spring member has now been released and is in position to engage the next higher tooth of the rack. As the key lever is released, a spring, 110, throws the pawl back to its normal position, removing the rigid member and causing the spring member to engage the rack, the weight of the same and parts it carries depressing the spring and lowering the stick one space ready for the next type. Now, when type have been specially manufactured for the machine, it is designed to so form the rack that one space will admit the smallest type and two spaces the largest. Now to space the same, say, for instance, for the letter "m" without operating the hopper, I provide an additional spacing key lever, 111, which operates the feed device, but does not operate the hopper. An extra space having been given the "m" hopper can then be operated and the type properly deposited in the stick. In certain cases where, for instance, a number of narrow letters are used, it may be found that too much space is being given and the top of the type last deposited is too far below the level of the type carrier bringing the next type. To remedy this I use a bell crank brake lever, 112, by which the feed of the rack may be checked until space is taken up, the operator being enabled to see through the slit in the forward portion of the type "stick" and determine when to use the brake lever or spacer.

114 is a short thumb lever which is secured to the rock-shaft by means of which the said shaft may be turned to a greater degree than could be done by the key levers and thus entirely disengage the pawl from the rack and permit the same to be raised to again start filling the stick after the same has been emptied.

The operation of the type carrier is as follows: The type, falling by gravity on the inclined slides under the hopper, is pushed off the same into the type carrier seat by the spring ejector. The slide being moved through its ways by the action of the mechanism described carries the type toward the stick which has, on the first movement of the key lever, been turned toward the particular hopper from which it is designed to take type and is held by the stop mechanism described. Now when the telescopic end of the slide

reaches the stick its movement is stopped by a pin, 115, engaging a stop, 116, on the ways. The slide, however, continues to move and the spring ejector moves forward in the type seat engaging the butt of the type and forcing it out face foremost into the stick. When the key lever is released, the springs return the slide, the spring of the telescopic end forcing it out to its normal position. As the slide returns, the spring ejector is forced down under the type which has been deposited on the inclined guides as the last type was removed, the forward end of the slide being depressed in the slot, 55, at the rear of the type seat until it passes through the slot in the rear of the hopper back of the type and is again ready for operation; the rearward movement of the slide being limited by a stop, 117. To prevent the type from being displaced from the type carrier during its passage, I provide a horizontal cover sufficiently raised above the plane through which the type carriers pass to permit their free movement, but close enough to prevent the type from being displaced. This I have removed in the drawings, but have shown it as at 117 in Fig. 2.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a type setting machine, the combination with a vertical type receiving "stick," of a series of type hoppers arranged in the arc of a circle having its center in the vertical center line of the "stick," a series of radially arranged slides, connected with the hoppers, for carrying the type to the "stick," mechanism for operating the slides, and a horizontal cover extending over the line of travel of the slides between the hoppers and "stick," whereby the type are prevented from being displaced during their passage from the hoppers to the "stick," substantially as shown and described.

2. In a type setting machine, the combination with a vertical type receiving "stick," and mechanism for moving the same vertically a given space at each operation of the machine, of a series of type hoppers arranged in the arc of a circle having its center in the vertical center line of the "stick," a series of radially arranged slides, connected with the hoppers, for carrying the type to the "stick," mechanism for operating the slides, ejecting mechanism for discharging the type into the "stick," and a horizontal cover extending over the line of travel of the slides between the hoppers and "stick," whereby the type are prevented from being displaced during their passage from the hoppers to the "stick," substantially as shown and described.

3. In a type setting machine, the combination with a vertically movable frame carrying a vertical "stick" or type receiver, and feed mechanism for moving the frame and "stick" vertically a given space at each operation of the machine, of a series of type hoppers ar-

ranged in the arc of a circle having its center in the vertical center line of the "stick," mechanism for turning the "stick" toward any desired hopper, a series of stops for holding said "stick" as adjusted, mechanism for operating said stops, a series of radially arranged reciprocating slides, connected with the hoppers, for carrying the type to the "stick," mechanism for operating the slides, and ejecting mechanism for discharging the type from the slides into the "stick," substantially as shown and described.

4. In a type setting machine, the combination with a vertically movable frame carrying a vertical "stick" or type receiver, and feed mechanism for moving the frame vertically a given space at each operation of the machine, of a series of type hoppers arranged in the arc of a circle having its center in the vertical center line of the "stick," mechanism for turning the "stick" toward any desired hopper, a series of stops for holding said "stick" as adjusted, mechanism for operating said stops, a series of radially arranged reciprocating slides connected with the hoppers, for carrying the type to the "stick," mechanism for operating the slides, ejecting mechanism for discharging the type from the slides into the "stick," and a series of key levers, each key lever controlling one of the stops, slide and ejecting mechanisms and all the key levers controlling the turning and feed mechanisms of the "stick," all constructed, arranged and operating substantially as shown and described.

5. In a type setting machine, the combination with a vertical type receiving "stick," of a series of vertical type hoppers arranged in the arc of a circle having its center in the vertical center line of the "stick," a series of reciprocating slides passing below the lower discharge ends of the hoppers and adapted to receive the type from said hoppers, a series of key levers, and intermediate mechanism connecting the slides and key levers, whereby the slides are operated to convey the type from the hoppers to the "stick," and a horizontal cover extending over the line of travel of the slides between said hoppers and stick, whereby the type are prevented from being displaced from the slides, substantially as shown and described.

6. In a type setting machine, the combination with a vertically movable frame carrying a vertical "stick" or type receiver, of a series of vertical type hoppers arranged in the arc of a circle having its center in the vertical center line of the "stick," a series of radially arranged ways located below said hoppers, a series of slides mounted in the ways and having telescopic ends forming type carriers, adapted to receive the type from the hopper, springs holding the telescopic type carrier normally away from the end of the slide, stops to limit the forward movement of said telescopic type carrier, spring ejectors secured to the slides and adapted to travel over the car-

rier as the same is stopped and discharge the type, mechanism for moving the slides toward the "stick," and springs for returning the same to its normal position, all constructed, arranged and operating substantially as shown and described.

7. In a type setting machine, the combination with the vertical "stick" or type receiver, the series of vertical type hoppers arranged in the arc of a circle having the "stick" as a center, the series of radially arranged ways secured below the hoppers, the inclined guides, 58, located below the discharge end of the hopper, the slides, 41, mounted in said ways, and provided with the telescopic end or type carrier, 43, having the spring, 50, a stop for limiting the movement of the type carrier, the spring ejector, 54, normally resting on the rear of the type carrier, mechanism for moving the slides toward the "stick," and a spring for returning the same to their normal position, all constructed, arranged and operating substantially as shown and described.

8. In a type setting machine, the combination with the series of type hoppers, the radially arranged ways under said hoppers, the guides, 58, located below the discharge end of the hoppers, and having a slot, 59, between said ways, the slides, 41, mounted in the ways and having the telescopic ends, 43, forming the type carrier, and having the longitudinal recess or type seat, 52, and slot, 55, the spring, 50, between the telescopic end and slide, the spring type ejector secured to the slide adapted to move over the recess in the carrier, a stop for limiting the movement of the telescopic end, mechanism for moving the slides toward the "stick," and springs for returning said slides to their normal position and bring the type carrier under the hopper to receive the type, all constructed, arranged and operated substantially as shown and described.

9. In a type setting machine, the combination with a vertical "stick" or type receiver, of the series of type hoppers, the radially arranged ways under said hoppers, the slides, 41, mounted in said ways and adapted to receive the type and carry the same to the "stick," the stop, 51, limiting the outward movement of the slides, the horizontal cover, 118, extending over the line of travel of the slides, the series of key levers, intermediate mechanism connecting the key levers and slides, and springs for returning the slides to their normal position, all constructed, arranged and operating substantially as shown and described.

10. In a type setting machine, the combination of a frame, a vertical shaft mounted in said frame, and carrying a vertical "stick" or type receiver, means for turning said shaft and "stick" to the right or left, and a horizontal stop arm projecting from the shaft, at right angles to the front of the "stick," a series of hoppers arranged in the arc of a circle

having its center in the vertical center line of the "stick," a series of radially movable stops arranged under each hopper, and mechanism for operating said stops, simultaneously with the movement of the vertical shaft, whereby the stop operated will engage the stop arm and hold the "stick" opposite the hopper of said stop, substantially as shown and described.

11. In a machine for setting type, the combination with a frame, a vertical shaft, mounted in said frame and carrying a vertical "stick" or type receiver, means for turning said shaft, and a stop arm projecting from the shaft at right angles to the front of the "stick," a series of radially arranged hoppers, a series of radially movable stops, 76, one located under each hopper, a series of bell crank levers, 78, links, 79, connecting the stops and levers, a series of key levers, links, 80, and springs, 81, connecting the bell crank levers and key levers, and springs, 82, for returning the stops to their normal position, all constructed, arranged and operating substantially as shown and described.

12. In a machine for setting type, the combination with a frame, a vertical shaft, 16, mounted in said frame, and carrying a vertical "stick" or type receiver, oppositely disposed wings, 95, projecting from said shaft, of a series of key levers, independent horizontal rock-shafts, 86 and 87, having lever arms, 88, and depending links, 89, connected by cross-bars, 90, adapted to be engaged by the key levers, counter rock-shafts, 91, having on one end bell crank levers, 94, adapted to engage the wings, 95, and on their other end lever arms, 92, lever arms, 88^a, on the rock-shafts, 86 and 87, springs, 93, connecting the lever arms, 92, 86 and 87, springs, 96, for returning the mechanism to its normal position, and springs, 28, of equal strength for returning the "stick" to its normal position, all constructed, arranged and operating substantially as shown and described.

13. In a type setting machine, the combination with a vertical rack bar, 12, mechanism for feeding said rack vertically, a vertical shaft mounted and capable of turning on said rack, and carrying a vertical "stick" or type receiver, mechanism for turning said shaft and "stick," and a series of key levers controlling the feed mechanism for the rack and

turning mechanism for the shaft and "stick," substantially as shown and described.

14. In a machine for setting type, the combination with the vertical shaft, 16, carrying the rectangular frame, 19, having on its upper end the hollow rod, 20, of the removable "stick," 22, having its top and front open, and slot, 24, in its back, and the rod, 30, mounted in the hollow rod, 20, and carrying on its lower end the type guard, 29, having the outwardly beveled end and the spring, 32, controlling said type guard, substantially as shown and described.

15. In a machine for setting type, the combination with a frame, a vertical rack bar mounted in said frame and carrying on its upper end a shaft, supporting a vertical "stick" or type receiver, feed mechanism engaging the rack, a series of key levers, mechanism connecting the key levers and feed mechanism, whereby said feed mechanism is operated as each key is operated, and the rack moved vertically a given distance at each stroke of a key, substantially as shown and described.

16. In a machine for setting type, the combination with a frame, a vertical rack bar mounted in said frame, and carrying a vertical "stick" or type receiver, of feed mechanism, consisting of a pivoted pawl, 100, having a solid member, 101, and a spring member, 102, adapted alternately to engage the rack, a horizontal rock-shaft, 103, provided with a lever arm, 105, having depending links, 106, and a lever bar, 107, a link, 108, connecting said pawl and lever arm, 105, and a series of key levers engaging the lever bar, 107, all constructed, arranged and operating substantially as shown and described.

17. In a type setting machine, the combination with a frame, a vertical rack bar mounted in said frame and carrying a vertical "stick" or type receiver, feed mechanism for moving said rack and "stick" vertically, and a brake lever, 112, engaging the rack and controlling the vertical movement of said rack and "stick," substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT S. HOGE.

Witnesses:

ALEX. S. STEUART,
GEO. M. COPENHAVER.