No. 732,560. PATENTED JUNE 30, 1903.

W. J. HUSTON & C. W. SMITH.

TYPE FINISHING MACHINE.

APPLICATION FILED MAR. 10, 1902.

NO MODEL. 5 SHEETS—SHEET 1.

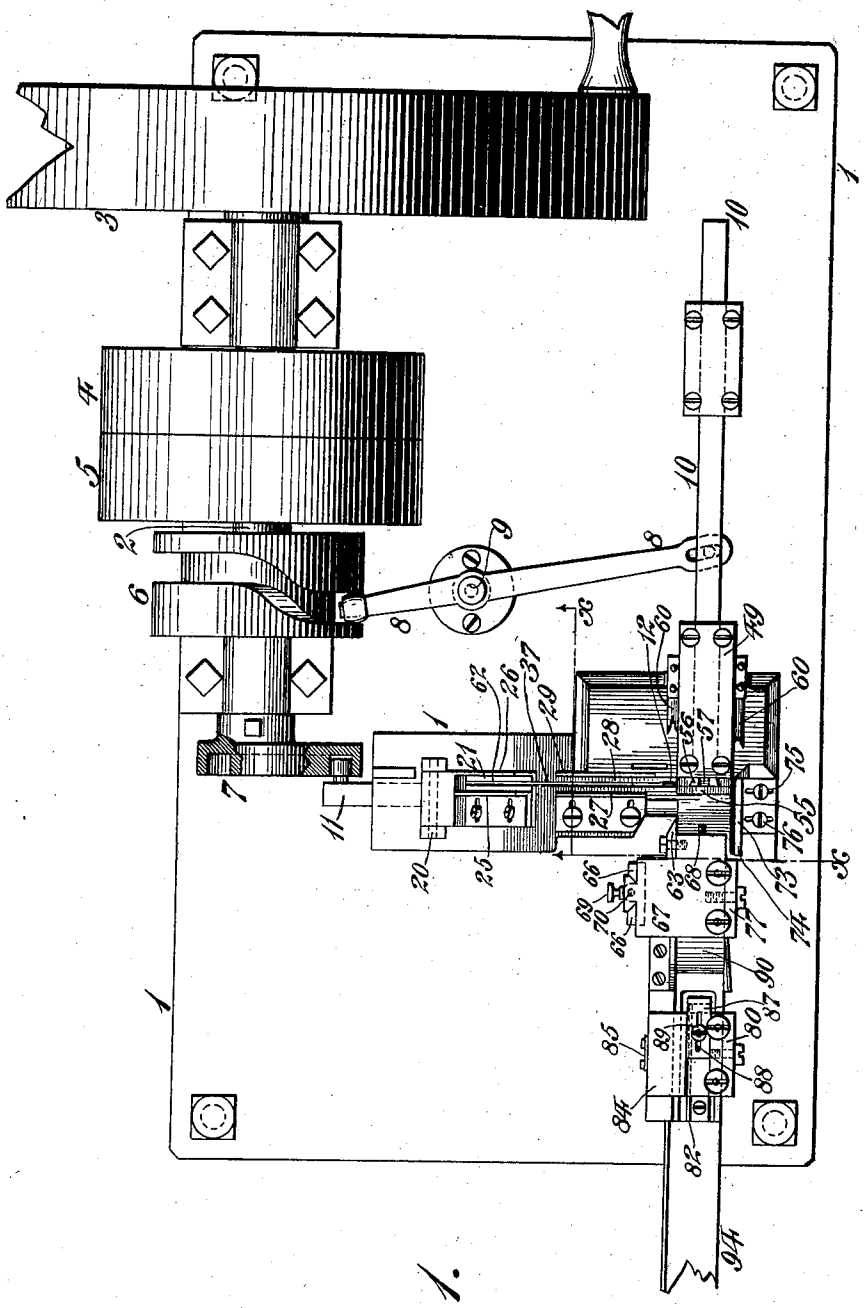


Fig. 1.

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NO MODEL. 5 SHEETS—SHEET 2.

Fig. 2.

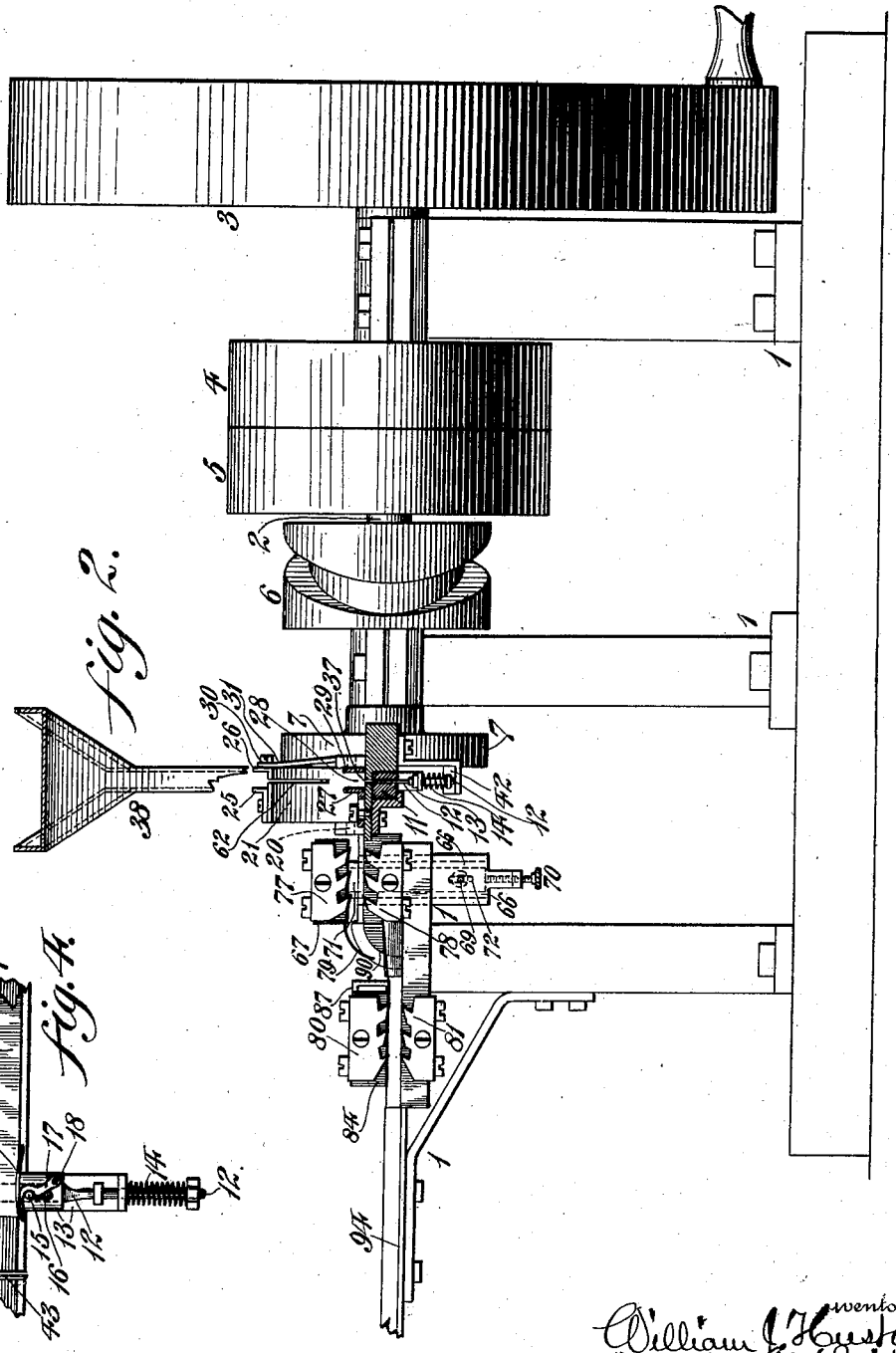


Fig. 4.

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NO MODEL. 6 SHEETS—SHEET 3

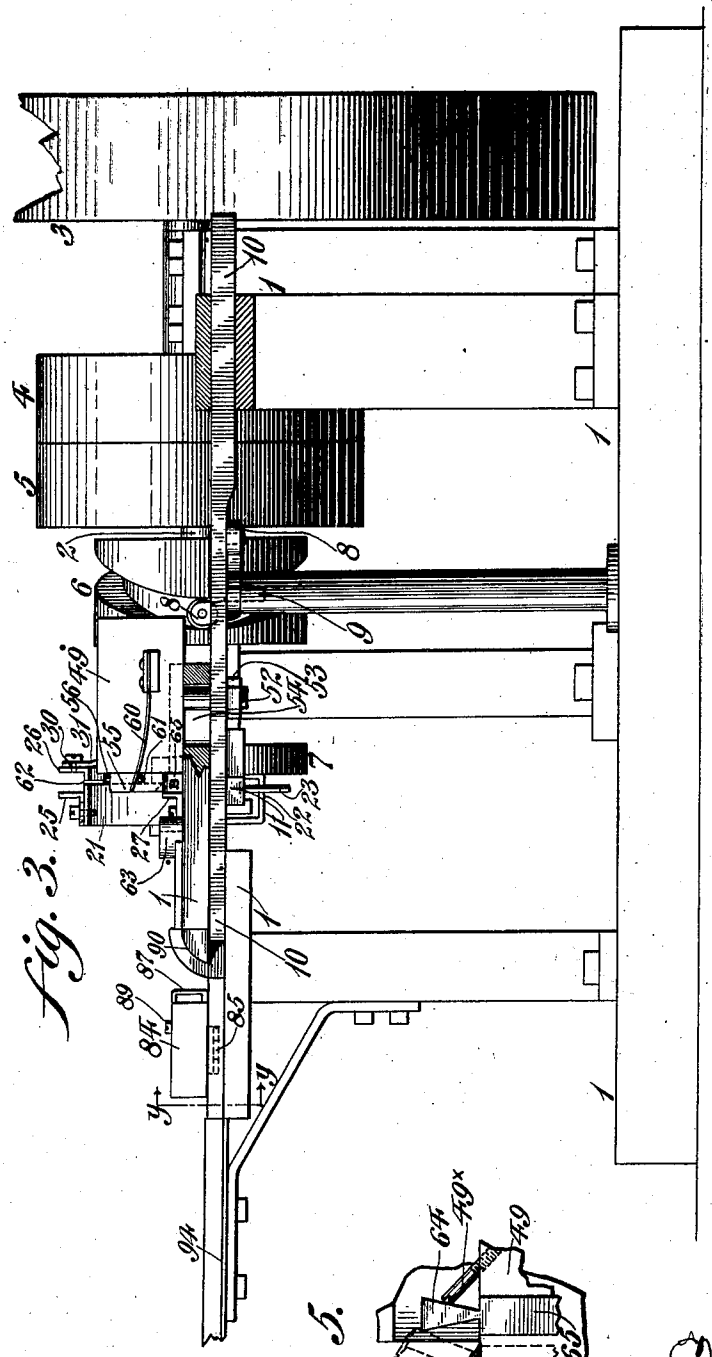


Fig. 3.

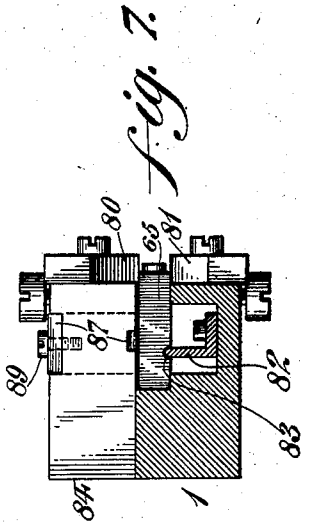


Fig. 7.

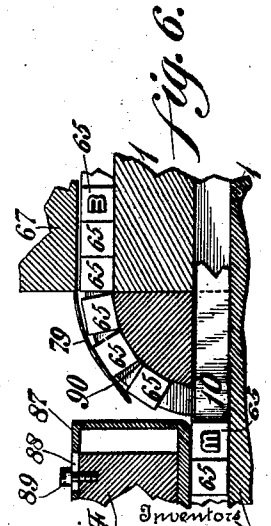


Fig. 6.

Fig. 5.

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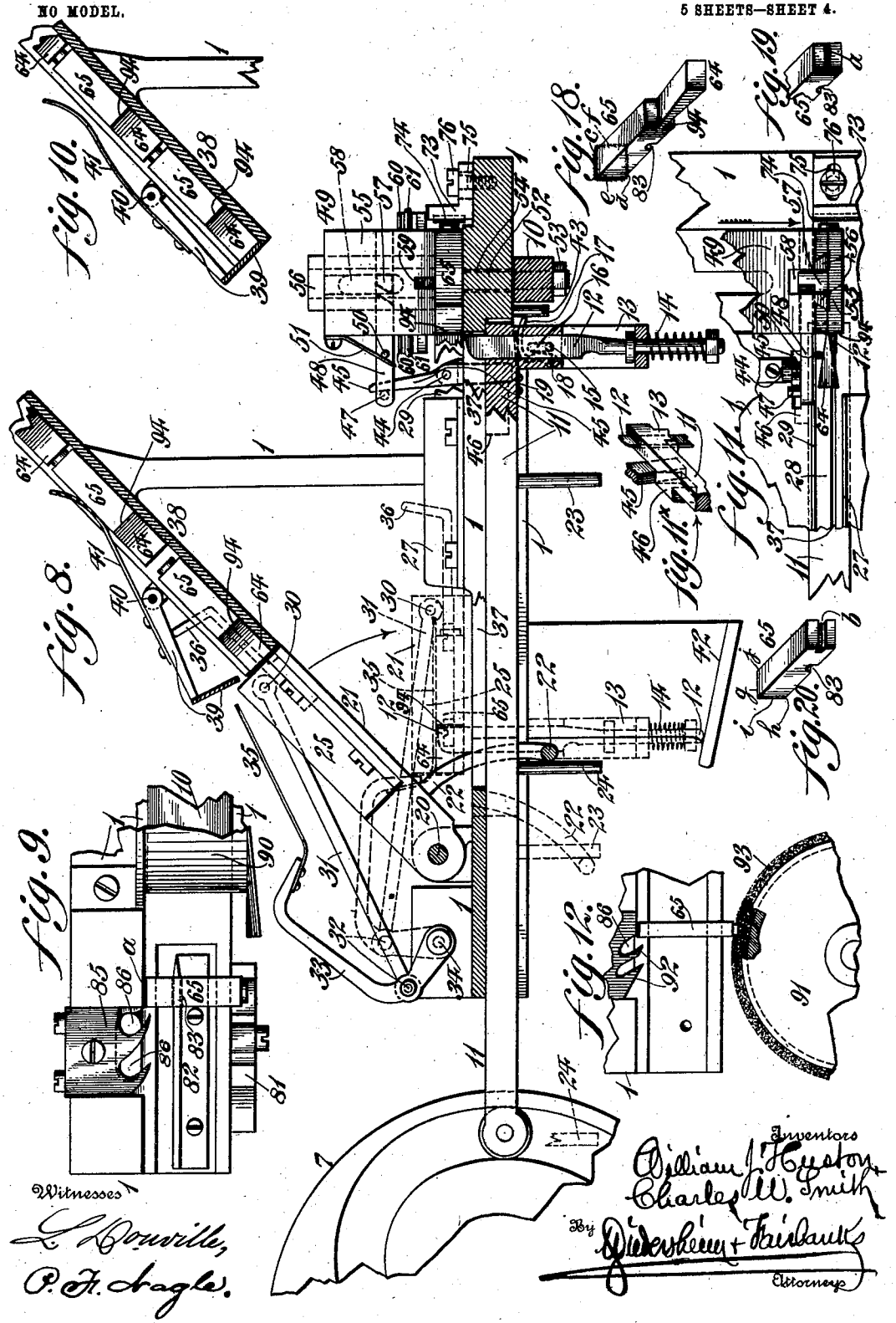
No. 732,560. PATENTED JUNE 30, 1903.

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TYPE FINISHING MACHINE.

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NO MODEL. 5 SHEETS—SHEET 4.



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No. 732,560. PATENTED JUNE 30, 1903.

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TYPE FINISHING MACHINE.

APPLICATION FILED MAR. 10, 1902.

NO MODEL. 5 SHEETS—SHEET 5.

Fig. 14.

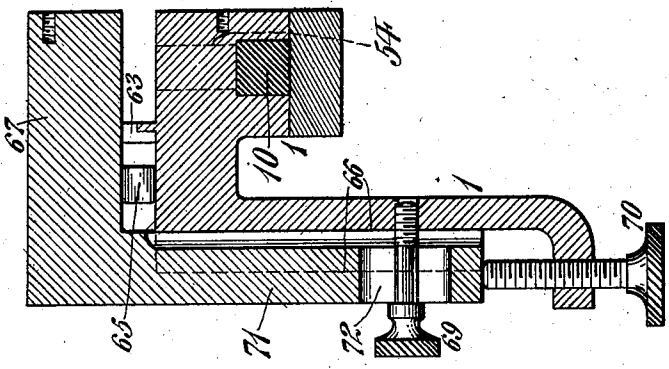


Fig. 13.

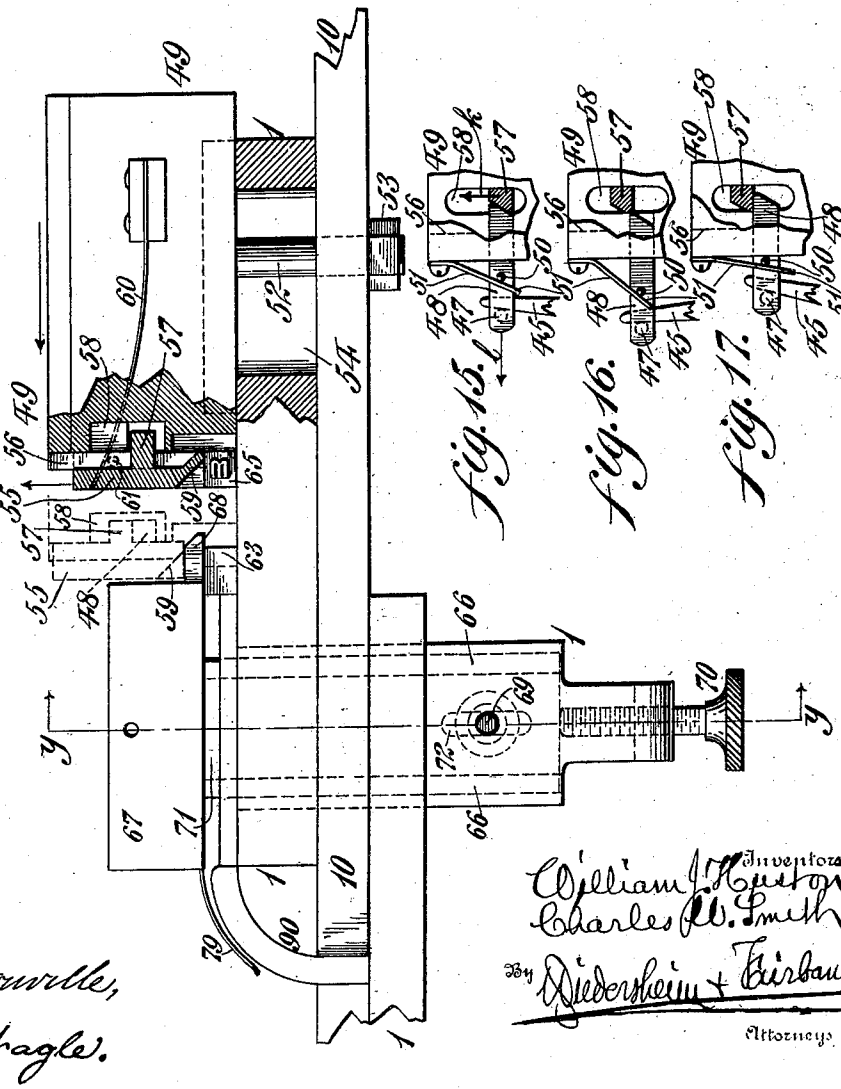


Fig. 15.

Fig. 16.

Fig. 17.

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No. 732,560. Patented June 30, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM J. HUSTON AND CHARLES W. SMITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO KEYSTONE TYPE FOUNDRY, OF PHILADELPHIA, PENNSYLVANIA, A FIRM.

TYPE-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 732,560, dated June 30, 1903.

Application filed March 10, 1902. Serial No. 97,473. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. HUSTON and CHARLES W. SMITH, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented new and useful Improvements in Type-Finishing Machines, of which the following is a specification.

Our invention relates to improvements in type-finishing machines; and it consists of means for subjecting the type as cast to a series of operations, whereby they are completed.

Figure 1 represents a plan view of a portion of a type-finishing machine embodying our invention. Fig. 2 represents a partial side elevation and partial vertical section on line *x x*, Fig. 1. Fig. 3 represents another side elevation, partly broken away. Fig. 4 represents a side elevation of a detached portion. Fig. 5 represents a plan view, on an enlarged scale, of a detached portion. Fig. 6 represents, a longitudinal vertical section of a detached portion. Fig. 7 represents a transverse vertical section of a detached portion. Fig. 8 represents a partial side elevation and partial vertical section of a detached portion. Fig. 9 represents a plan view of a detached portion. Fig. 10 represents a partial side elevation and partial vertical section of certain parts seen in Fig. 3, but in different positions. Fig. 11 represents a plan view of parts seen in Fig. 8. Fig. $11^{\times}$ represents a perspective view of a portion on a reduced scale. Fig. 12 represents a plan view of a detached portion of an additional part of the machine. Fig. 13 represents a partial side elevation and partial vertical section of a detached portion. Fig. 14 represents a vertical section on line *y y*, Fig. 13. Figs. 15 to 17, inclusive, represent partial side elevations and partial vertical sections of certain portions of the machine in different positions. Fig. 18 represents a perspective view of a type as taken from the mold. Fig. 19 represents a perspective view of a portion of a type after the "jet" or tail has been removed therefrom. Fig. 20 represents a perspective view of a finished type.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the frame of the machine, on which is journaled the driving-shaft 2, which latter is provided with the balance-wheel 3, the tight and loose pulleys 4 and 5, respectively, and the cams 6 and 7, it being noted that the cam 6 is adapted to impart a rocking motion to the lever 8, fulcrumed at 9 and connected with the bar 10 on the frame 1, so as to impart a reciprocating motion to said bar, the latter being guided in a horizontal guideway in said frame.

The cam 7 imparts a reciprocating motion to the sliding bar or rod 11, it being noted that the latter moves in a direction at a right angle to that of the bar 10.

The bar 11 feeds the type through a channel at right angles to that through which they are fed by the bar 10, it being noted that the bar 11 carries a finger 12, which is guided in a hanger 13 on said bar 11 and is adapted to abut against a suitable portion of the type at a proper time in order to convey the same to a pusher, which feeds said type to a series of cutters, which are adapted to remove any superfluous metal from the type, it being understood that said finger is adapted to be raised and lowered for the purpose described and is engaged by the spring 14, so as to be retained in its lowermost or normal position. On said finger 12 is a pin 15, (see more particularly Fig. 4,) which passes through a slot 16 in the hanger 13 and projects beyond the latter, so as to come in the path of the recessed hook 17, pivoted at 18 to the hanger 13 and retained in its forward or normal position by the spring 19.

Pivoted at 20 to the frame 1 (see more particularly Figs. 1, 2, and 8) is a chute 21, which is provided with a depending member 22, against which the pins 23 and 24 carried by the bar 11 are adapted to abut, said chute having thereon two angle-plates 25 and 26, which form a guide or channel for the type, plate 25 being adjustable to vary the size of the channel according to the size of the type.

The frame 1 has fitted thereon an adjustable plate 27 and stationary plate 29 opposite thereto, said parts forming the type-guide 28, which is in alinement with the guide formed by plates 25 and 26 on the chute 21. (See Fig.

1.) The chute 21 has pivoted thereto at 30 one end of a rod 31, the opposite end of which is pivoted at 32 to a lever 33, pivoted at 34 to the frame 1. (See Fig. 8.) The object of the lever 33 is to cause the spring 35, which projects therefrom, to bear against the upper portion of a type when the latter is within the chute 21 and said chute is in the position seen in dotted lines. Projecting from the upper end of said lever is the spring or spring-finger 35, and projecting upwardly from the chute 21 is the elbow-arm 36, for purposes to be explained.

In the frame 1 is a slot 37, (see Figs. 1, 2, and 8,) through which the above-named finger 12 is passed in its forward and backward movements on the bar 11. On the frame 1 is supported a chute 38, (see Fig. 8,) the lower end of which is in alinement with the upper end of the chute 21 when the latter is in its raised position, and at said lower end is a gate 39, pivoted at 40 to said chute 38 and having a spring 41 bearing against it.

Supported on frame 1 and below the path of bar 11 is an inclined cam 42, on which the lower end of the finger 12 rides as the bar 11 approaches the end of its stroke from right to left. The frame 1 is also provided with a pin or stud 43, (see Fig. 4,) against which the hook 17 is adapted to abut. Pivoted at 44 to the frame 1 is a lever 45, (see Figs. 8 and 11,) against the lower limb of which is adapted to abut a projection 46 on the bar 11, so as to cause said lever 45 to turn on its pivot 44 for a purpose hereinafter described.

The upper portion of the lever 45 is adapted to contact at certain times with a pin or stud 47, which projects from a bar 48, which is guided in a block or pusher 49 and adapted to slide therein, it being noted that said bar 48 carries a pin 50, against which bears one end of a spring 51, which latter is adapted to restore said bar 48 to its normal position when so required. (See Figs. 8, 11, 15, 16, and 17.)

It will be noted on referring to Figs. 3, 8, and 13 that the block or pusher 49 is secured to the bar 10 in the present instance by the bolt 52 and nut 53, it being also noticed, as in Fig. 13, that the frame 1 is provided with a slot 54, through which the bolt 52 is passed, so that the latter may follow the forward movements of the bar 10 and transmit these movements to the block or pusher 49.

On the block or pusher 49 is the vertical plate or rod 55, which is guided in ways 56 and is adapted to be moved up and down on said pusher 49, said plate having thereon the laterally-projecting lug 57, which is freely fitted in a slot 58 in the pusher 49, it being apparent that said slot permits said lug to follow the up-and-down movements of the plate 55, said plate being provided with an inclined foot 59 (see Fig. 13) and being retained normally in its lowermost position by the springs 60, which bear against pins 61 on said plate. The object of the plate 55 is to bear against the type, so as to retain the latter in its proper position when the same is being advanced by the pusher 49.

It will be noted that the chute 21 is provided with a vertical slot 62, which is in alinement with the slot 37 in the frame 1, (see more particularly Figs. 1 and 2,) the finger 12 being adapted to pass at times through both slots.

Secured to the frame 1 and approximately in the path of one side of the pusher 49 is a knife 63, which is adapted to remove the jet or tail portion 64 from a type 65, (see Figs. 1 and 5,) as will be hereinafter more fully described.

Guided in ways 66 in the frame 1 is a head 67, which is adapted to be vertically adjusted according to the size of the type to be finished, it being understood that said head 67 serves as a guide, under which the type is passed. Projecting from said head is the finger 68, (seen in Fig. 13,) said finger having an inclined face for engagement with the inclined face of the foot 59, so as to raise the latter and consequently the plate 55. The head 67 is retained in its adjusted position by the screws 69 and 70, it being noted that the depending member 71 of the head 67 is provided with a slot 72, through which the screw 69 passes, to permit said head to be raised and lowered. (See Figs. 2, 13, and 14.)

On the frame 1 is a longitudinally-extending gage 73, (see Figs. 1. 8, and 11,) the object of which is to act as a stop for the type in order that the latter will not go beyond the desired point when advanced by the finger 12, it being noted that said gage 73 is faced with a cushion 74 of soft material, against which the letter or character on the type 65 abuts, so that no injury results thereto, said gage being provided with slots 75 and screws 76 for the purpose of adjusting the same for various sizes of type.

On the head 67 are the vertically-arranged cutters 77, below which are the cutters 78, which are mounted on the frame 1. Projecting from the head 67 is a spring 79, beneath which, on the frame, is a channel having a curved base forming the chute 90, which acts as a guide for the type and serves to impart a quarter-turn thereto. (See Figs. 2 and 6.)

Secured to the frame 1 are the vertically-arranged cutters 80 and 81, in the present case at the left of the cutters 77 and 78 and below the latter, it being noted that the cutters 80 are located above the cutters 81. (See Figs. 2 and 7.) Rising from the frame 1, back of the cutters 80 and 81, is a type-guide 82, the same being adapted to enter the depression 83 in the type, as best seen in Figs. 1, 7, and 9, and thus properly guide the type while the latter is being fed between the several cutters, it being understood that the portion 84 of the frame 1 under which the type passes also assists in retaining the type in a proper position during the finishing of the same. (See Figs. 6 and 7.)

To the frame 1 is secured the horizontally-arranged cutter 85, (see Fig. 9,) below which

in said frame is an opening 86, through which the metal removed from the type by said cutter 85 may drop. On the portion 84 of the frame 1, adjacent to the chute 90, is a guide 87, (see Figs. 1 and 6,) which is provided with a slot 88 and a screw 89, so as to be permitted to be moved nearer to or farther from said chute 90. The object of the guide 87 is to provide a wall against which a proper portion of a type abuts when the latter is sliding down the chute 90, and thus prevent the type from turning more than is necessary, thereby positively causing the latter to land upon the bar 10 in a proper position and, furthermore, preventing the type from leaving the bar 10 from any but the proper time.

When small-size types are to be finished in the machine, the guide 82 is removed, and in lieu thereof a wheel 91, Fig. 12, is employed to retain such type in contact with the cutter 92, which latter is with the the exception of dimensions substantially the same as the cutter 85, it being noted that said wheel has a periphery of soft material 93, into which the type sinks to such extent that although firmly pressed and held against the cutter 92 the material will not injure the type. On the frame 1 is the bed or stick 94^a, which is adapted to receive the finished types and from which they are removed in any suitable manner.

The operation is as follows: The types as cast are placed in the chute 38, as illustrated in Figs. 8 and 10, the jet or tail portion being in advance. Assuming the chute 21 to be in the position seen in dotted lines in Fig. 8, it will be apparent that the elbow 36 thereon will be removed from the gate 39, and the latter will occupy the closed position seen in Fig. 10, it being noted that the types in said chute 38 cannot leave the same, since the lowermost one is held by the gate 39. When the cam 7 has caused the bar 11 to move to its full extent from left to right, the pin 24 contacts with the depending member 22 of the chute 21 and raises the same, whereupon the upper arm or limb of the elbow 36 abuts against the carrier of the gate 39 and lifts and opens the same, thereby permitting the lowermost type to escape from the chute 38, the remaining types in the chute 38 being held by the pressure of the spring 41 due to the elevation of the gate 39. (See Fig. 8.) When the cam 7 causes the bar 11 to move to its full extent to the left, the pin 23 is brought in contact with the member 22 of the chute 21 and causes the latter to lower, as shown in dotted lines in Fig. 8. As the chute 21 lowers the gate 39 closes and the spring 41 is removed from the adjacent type in the chute 38, thus permitting the same to pass under said spring, limited by said gate, as seen in Fig. 10. The lowering of the chute 21 will cause the spring 35 to bear against the type within said chute 21 and prevent it from slipping therein. It will now be noticed that when the bar 11 is at the end of its stroke to the left the finger 12 is in the position seen in dotted lines in Fig. 8, the inclined shoe 42, on which said finger rides, causing the latter to reach a height sufficient to engage the shoulder 94 of a type. Then the bar 11 moves to the right and the finger conveys the type toward the block or pusher 49 and in front of the same. It will be noted on referring to Fig. 4 that the pin 15 is retained in its uppermost position by the depression on the hook 17, it being apparent that as said pin is secured to the finger 12 the latter will also be retained in its elevated position until the bar 11 has completed its movement toward the pusher 49, when the forward extremity of the hook 17 is brought into contact with the pin 43, which causes said hook to turn on its pivot 18 and leave the pin 15, whereupon the finger 12 is released and then lowered by the spring 14, so as to be placed into position seen in Fig. 8, after which said finger 12 is returned by the bar 11 and elevated by the shoe 42 in order to engage with another type and convey the latter to the pusher, it being apparent that when the pin 15 on said finger 12 is moving upward it bears against the side of the hook 17 and turns the latter on its pivot until it reaches the depression in the hook, (see Fig. 4,) when the spring 19 causes the hook to return to its normal position when the pin is seated in the depression in said hook, as seen in said Fig. 4, thus retaining the finger in its elevated position, in which it remains until again tripped by the pin 15, as hereinbefore described. Then the bar 11 returns and the pusher 49, and consequently the types in contact therewith, are moved at a right angle to said bar 11 toward the cutter 63 and the type pressed against the latter, when the jet or tail portion thereof is broken therefrom, as indicated by dotted lines in Fig. 5. The types now reach the cutters 77 and 78, and as they, when taken from the mold, have rough sides, as at *c*, *d*, *e*, and *f*, (see Fig. 18 and 19,) the sides *c* and *d*, which are above and below, are smoothed by said cutters 77 and 78. Now in order to present the other sides *e* and *f* to the cutters 80 and 81 the types are caused to turn by moving down the curved chute 90, as seen in Fig. 6, it being apparent that the sides *e* and *f*, which were in vertical planes when passing between the cutters 77 and 78, are thus caused to lie in horizontal ones when passing between the cutters 80 and 81. Thus when a type leaves the machine the several sides of the type corresponding to *c*, *d*, *e*, and *f* are perfectly smooth, as at *g*, *h*, *i*, and *j*. (Seen in Fig. 20.) The removal of the jet leaves a rough portion on the type, as at *a* in Fig. 19, and this is objectionable. Now when the type reaches the cutter 85 said rough portion is removed by the same, and the groove *b* in the type is likewise produced, as seen in Fig. 20. It will be noted, on referring to Fig. 6, that when the bar 10 completes its stroke from right to left and has brought the type in front of the same beneath the guide 87 and the portion 84 of the frame 1 the lowermost type

in the curved chute 90 of the frame 1 is ready to drop upon said bar 10 when the latter moves from left to right. The type resting on said bar will drop when the bar so moves and be in alinement with the other types occupying the right-lined chute containing the cutter 85, beneath the portion 84 of said frame, so as to lie in the path of the bar 10 when the latter moves from right to left. When the bar 10 has completed its stroke toward the block 67, (see Fig. 13,) the inclined shoe 59 of the plate 55 is brought in contact with the finger 68, whereupon said plate 55, and consequently the lug 57 thereon, is raised, said lug moving in the direction indicated by the arrow *k* in Fig. 15, whereby said lug will cause the bar 48 to move in the direction indicated by the arrow *l* in said Fig. 15 and occupy the position seen in Fig. 16 until said lug 57 clears the same, whereupon said bar 48, due to the action of the spring 51, will be brought under the lug 57, (seen in Fig. 17,) and thus retain said lug 57, and consequently the plate 55, in their elevated position, so that the type advanced by the finger 12 may be placed under said plate. (See Fig. 13.) Then the lever 45 is again turned upon its fulcrum 44 by the projection 46 on the bar 11, as seen in Figs. 8 and $11^{\times}$, whereupon said plate 55 is again released and dropped against the type by the springs 60, so as to retain the same in its proper position on its way to the jet-removing cutter 63, said springs being shown in Figs. 3, 8, and 13, and removed from Fig. 1 for purposes of clearness of the adjacent parts. The adjustment of the space between the frame 1 and block 67 may be accomplished by placing a type of the required size (see Fig. 14) upon the frame 1 and then lowering said block 67 by the screw 70 until the block is stopped by the type, after which the adjustment is preserved by tightening the screw 69.

In order to sustain the jet while it is subjected to the action of the cutter or breaker 63, the pusher or push-block 49 has a prop $49^{\times}$ therein, the same being adapted to bear against what may be termed the "rear" of the jet, both while the type is being advanced and while the base of the jet contacts with said cutter or breaker 63, it being noticed that said prop is movably fitted to said pusher so as to be adjusted with precision relatively to its degree of pressure or contact with said jet.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A frame, a type-receiving chute with a depending member, a sliding bar and pins on said bar, said chute and bar being supported on said frame, and said pins being adapted to engage opposite sides of said member to raise and lower said chute.

2. In a type-finishing machine, a frame, the latter having a slot therein, a finger in said slot and means for moving said finger in horizontal and vertical directions, in combination with a rising-and-falling chute, which is mounted on said frame and provided with a slot, and a type-guide on said chute, the slots of said frame and guide being in register and communication.

3. A pivotal chute, a frame on which the same is mounted, a rod pivoted on said chute, a lever mounted on said frame and pivotally connected with said rod, and a pressure device on said lever.

4. A type-feeding mechanism comprising a support, a stationary chute mounted thereon, a second chute pivoted on said support and means to swing said second chute about its pivot, a gate pivoted on the stationary chute and arranged to normally close the lower outlet thereof and an arm attached to the pivoted chute and arranged to engage said gate to open it when the pivoted chute is brought in alinement with the stationary chute.

5. A type-feeding mechanism comprising a support, a stationary chute mounted thereon, a second chute pivoted on said support and means to swing said second chute about its pivot, a gate pivoted on the stationary chute and arranged to normally close the lower outlet thereof, an arm attached to the pivoted chute and arranged to engage said gate to open it when the pivoted chute is brought in alinement with the stationary chute, and means on said gate to close the same on the removal of said arm therefrom by the withdrawal of said pivoted chute from said stationary chute.

6. A type-receiving chute, a support therefor, a type-retaining gate mounted on said chute, a movable carrier adapted to remove type from said chute, means on said carrier to open said gate and a spring on said gate extending rearwardly and arranged to bear on certain type in the chute when the gate is open and prevent them from sliding downwardly, said spring also acting to close the gate when the carrier is not in communication with the chute.

7. In a type-finishing machine, a frame, a sliding rod thereon, a lever mounted on said frame adapted to be engaged by said rod, a bar with which said lever is connected, a type-pusher on which said bar is freely mounted, a type-holding head movably mounted on said pusher, means for raising said head, a spring connected with said pusher for lowering said head, and a projecting lug on said head adapted to be engaged by said bar for positively controlling said head when in its lowered position.

8. In a type-finishing machine, a type-pusher, a rising-and-falling head on said pusher, a movable bar on said pusher, a projecting lug on said head adapted to engage said bar and pass over the same, an inclined foot on said head, a finger on the frame of the machine in the path of said foot for raising said head, and a spring bearing on said head for lowering the same.

9. In a type-finishing machine, a head, means for raising and lowering the same, a

projecting lug on said head, a type-pusher carrying said head, a bar movable in said pusher and adapted to have said lug pass over the same, a lever, and a spring connected with said bar for operating the latter in opposite directions and a movable rod on the frame of the machine adapted to engage said lever to operate the same.

10. A jet-cutter, a pusher, a frame on which said pusher is freely mounted, and a plate on said pusher adapted to sustain the type in its advancement to said jet-cutter.

11. In a type-finishing machine, a movable rod having a shoulder thereon, a pivotal lever having one limb adapted to be engaged by said shoulder, a type-pusher, a movable bar on said pusher, said bar being adapted to be engaged by the other limb of said lever, a rising-and-falling head fitted to said pusher and adapted to engage with said bar in different positions, and means for raising and lowering said head.

12. In a type-finishing machine, a frame, a curved chute therein, a horizontal guideway in the frame communicating with the lower terminal of said curved chute, a pusher leading to the inlet end of said curved chute, a push-bar in said guideway and a guide-piece on the frame adjacent to said curved chute, said piece being adjustable to and from said curved chute, and said pusher and push-bar being attached to the same moving part.

13. In a type-finishing machine, a frame, a pusher mounted thereon, a movable bar on said frame below said pusher and parallel therewith, means for operating said bar, and a bolt connecting said pusher and bar, said frame having a vertical slot therein in which said bolt is adapted to play.

14. In a type-finishing machine, a jet-breaker, a pusher for the type with a jet thereon and an auxiliary jet-engaging member on said pusher.

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