(No Model.) 4 Sheets—Sheet 1.

G. S. EATON & J. C. BIRCH.

MACHINE FOR RUBBING TYPES.

No. 380,558. Patented Apr. 3, 1888.

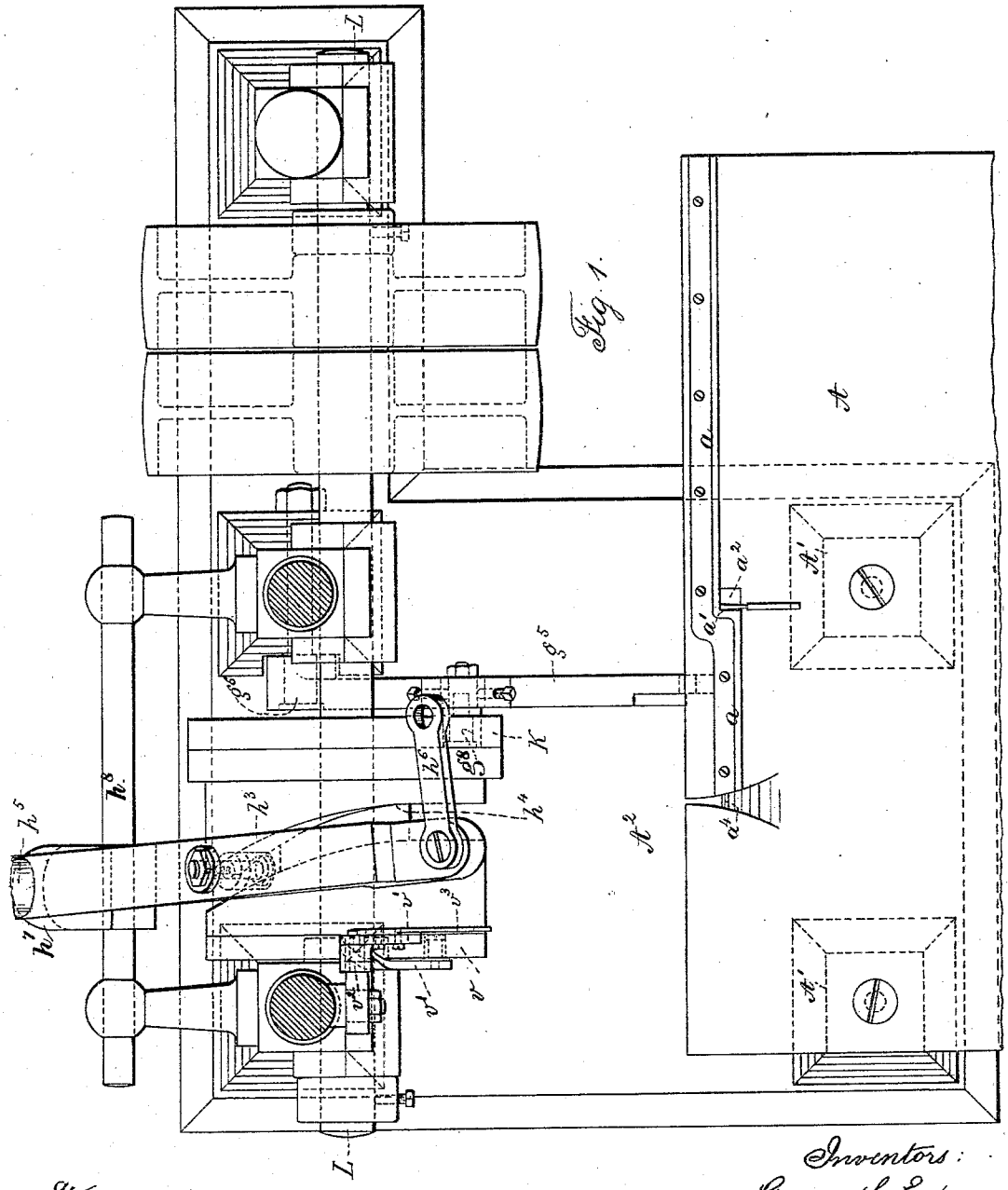


Fig. 1.

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Fig. 10.

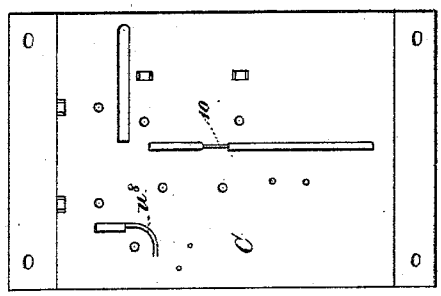
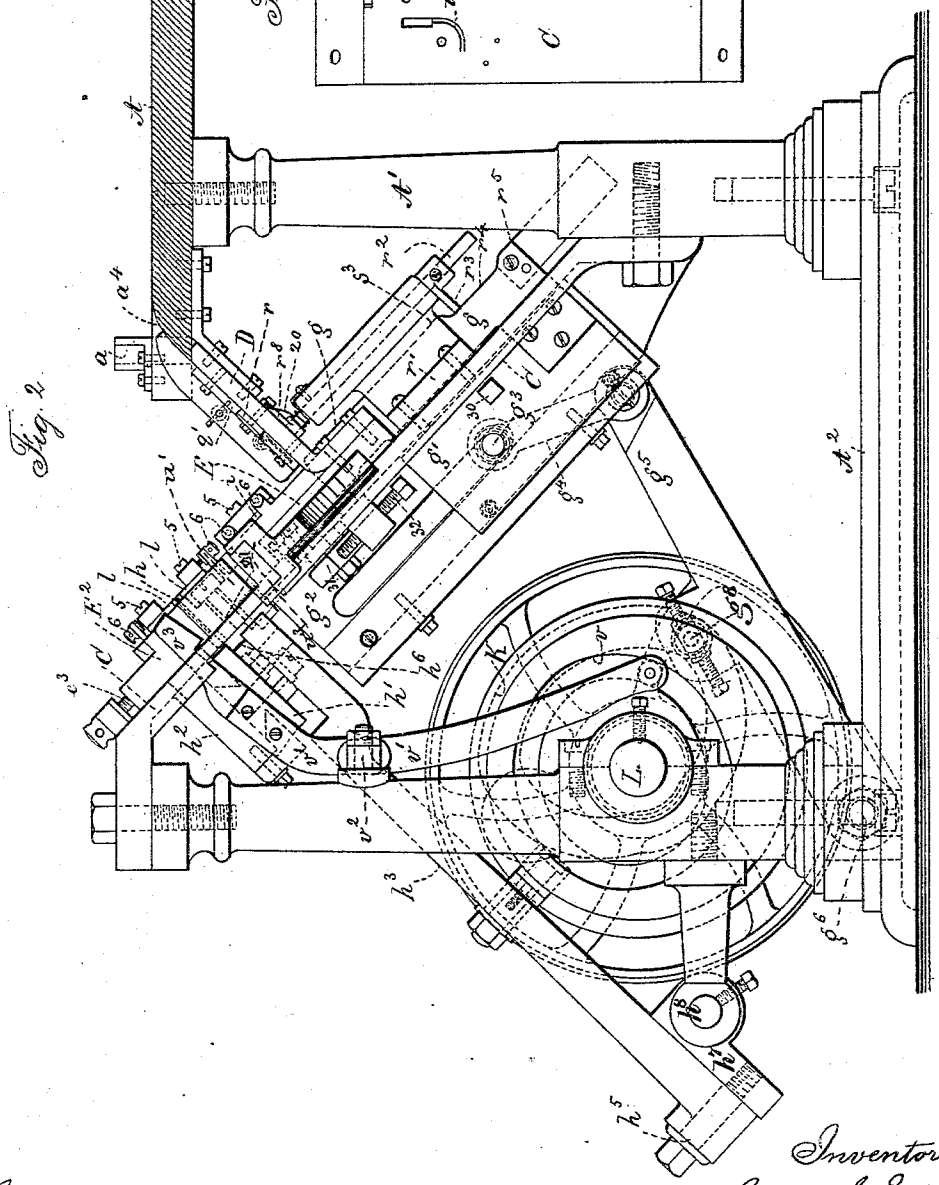


Fig. 2.



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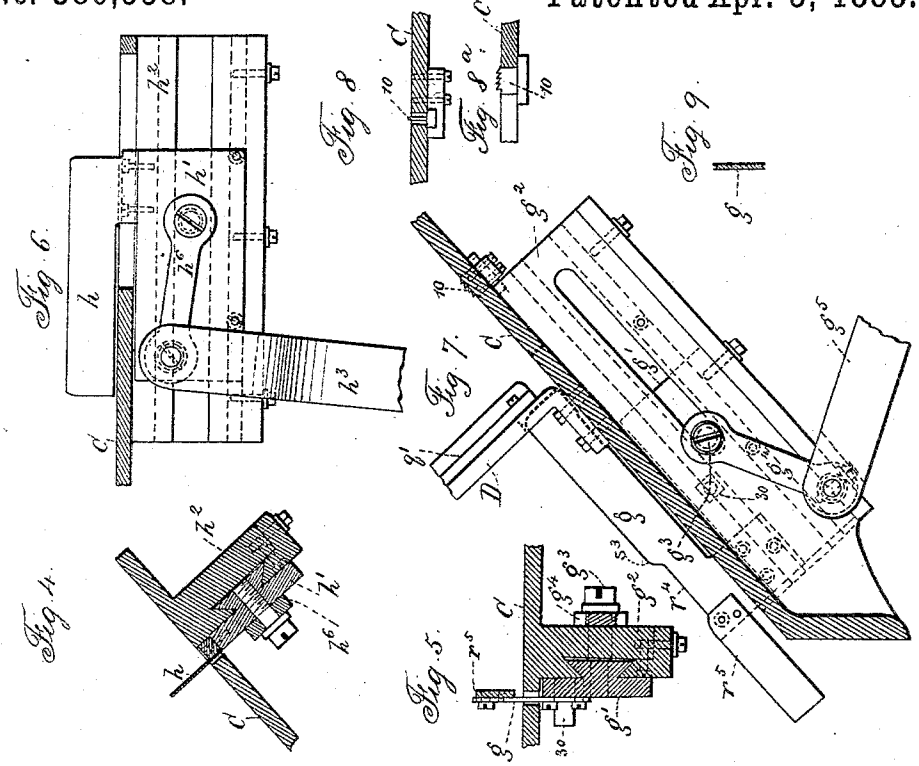
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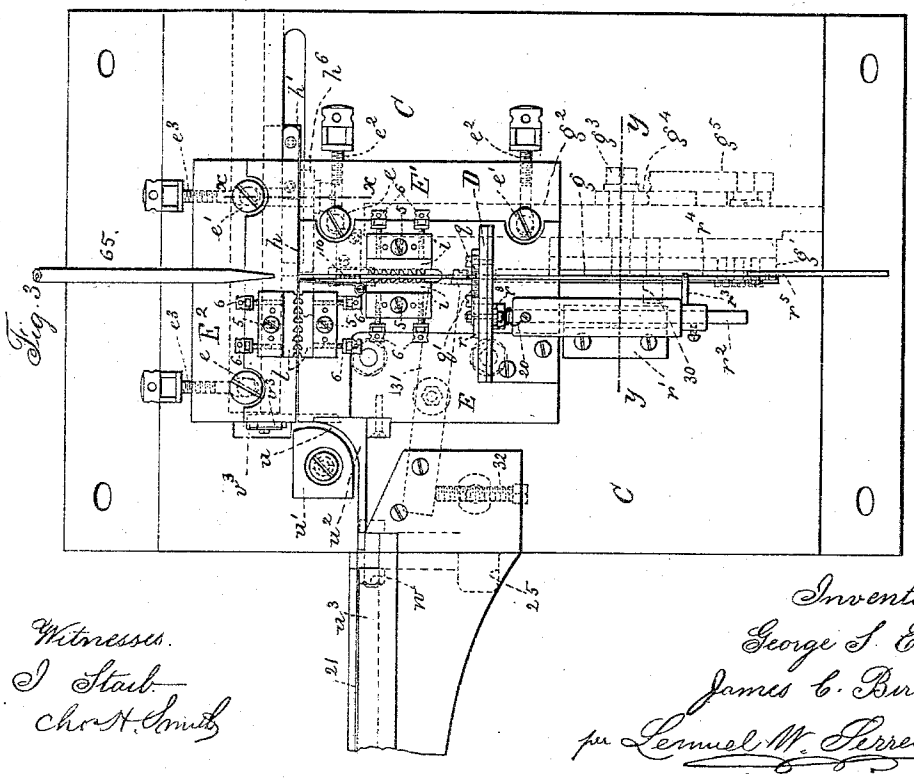
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MACHINE FOR RUBBING TYPES.

No. 380,558. Patented Apr. 3, 1888.





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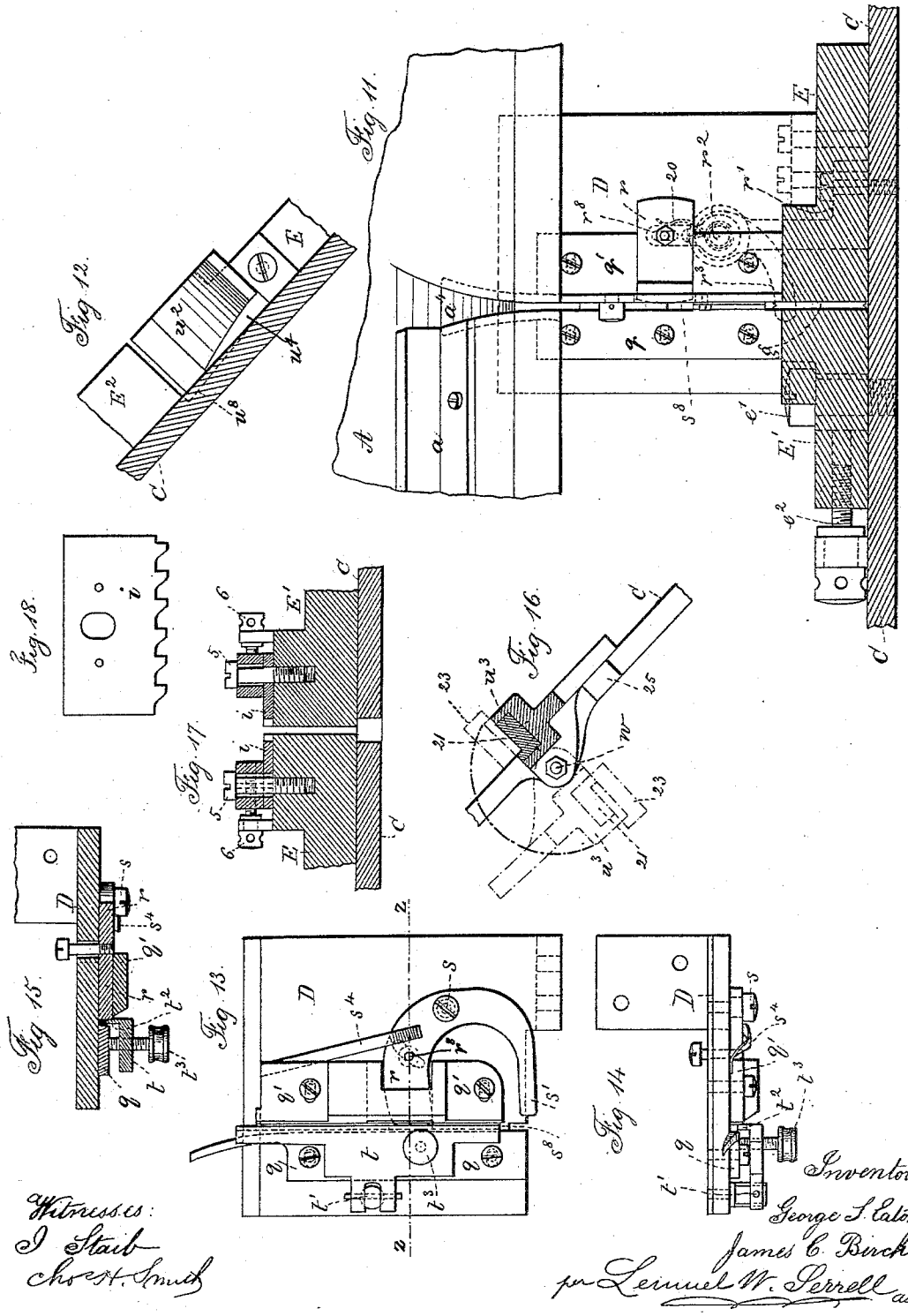
N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 4.

G. S. EATON & J. C. BIRCH.

MACHINE FOR RUBBING TYPES.

No. 380,558. Patented Apr. 3, 1888.



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UNITED STATES PATENT OFFICE.

GEORGE S. EATON AND JAMES C. BIRCH, OF BROOKLYN, NEW YORK, ASSIGNORS TO SAID GEORGE S. EATON.

MACHINE FOR RUBBING TYPES.

SPECIFICATION forming part of Letters Patent No. 380,558, dated April 3, 1888.

Application filed May 11, 1886. Serial No. 201,797. (No model.)

To all whom it may concern:

Be it known that we, GEORGE S. EATON and JAMES C. BIRCH, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Machinery for Rubbing Types, of which the following is a specification.

In this machine we have improved upon the type-rubbing devices shown in Letters Patent No. 278,785, granted to George S. Eaton. We make use of cheek-pieces between which the types are supported and smoothed as they are moved along one at a time, and while being moved the burrs or projections at the bases of the letters are removed by stationary cutters; but the cheek-pieces are straight and the body-plunger reciprocates in a straight line. The type, after two of its sides have been dressed, is carried off at right angles to its first movement and passed between stationary cheek-pieces and cutters to finish the other two sides of the type, and it is set up in line in a stick or rule. The bases of the types are nicked, and the dust and fine metallic particles are discharged and blown from the machine, so as not to adhere to or injure the types.

In the drawings, Figure 1 is a plan of the driving-shaft and parts connected therewith, the bed and rubbing mechanism being removed. Fig. 2 is a view of one end of the machine. Fig. 3 is a face view of the inclined bed and type-rubbing mechanism perpendicularly to the surface of such bed. Fig. 4 is a section of the "running-way" slide at the line $x\ x$, Fig. 3. Fig. 5 is a section of the body-plunger slide at the line $y\ y$, Fig. 3. Fig. 6 is a side view of the running-way and slide. Fig. 7 is a similar view of the body-plunger and slide. Fig. 8 is an end view showing the cutter for fretting or nicking the bases of the types. Fig. 8^x is a side view of the same. Fig. 9 is a section of the forward end of the body-plunger. Fig. 10 is a view, in smaller size, of the surface of the bed, the cheek-pieces, cutters, and other parts being removed. Fig. 11 is a face view of one form of the feeding-channel and retaining devices. Fig. 12 is a section of the bed and elevation of the concave type-guide at the delivery portion of the machine. Fig. 13 is a face view, and Fig. 14 an edge view, of a modified construction of the detaining and feeding devices endwise of the slide. Fig. 15 is a section at the line $z\ z$. Fig. 16 shows the type-holding rule and reversing device. Fig. 17 is a section of the bed-cutters and cheek-pieces; and Fig. 18 is a view, in larger size, of one of the cutters.

The types, as they come from the casting-machine, are laid upon the table A in mass. This table A is supported by columns A′, rising above the base plate or frame A^2. The table A is preferably flat and level, and it is provided with a fence or bar, a, screwed to its upper surface, and at a' there is a zigzag or offset forming an angle in the fence. The length of this offset is less than the usual length of the sprue or gate that remains upon the bases of the types after they are cast, and there is a hole at a^2 passing through the table A, so that the operator grasps the types in succession, moving each one around until the gate is pressed against the offset in the fence with sufficient force to break the gate off the type. This gate falls through the hole a^2, and is received as waste metal into a box or receptacle placed below the opening. The operator passes the type, base first, down the groove a^4 to the feeding mechanism, hereinafter described.

Upon the bed C the rubbing and dressing devices are secured. This bed is preferably at an angle of about forty-five degrees to the horizon in one direction; but the upper and lower edges are level, or nearly so.

Between the table A and the bed C an inclined chute, D, is placed with the feed-regulating devices, hereinafter described.

Upon the bed C there are the cheek-pieces E E′ E^2. The piece E is stationary, but the pieces E′ E^2 are adjustable. They are clamped to the bed by the screws $e\ e'$, and these pass through elongated holes, so that the cheek E′ can be moved by the screws e^2 toward or from the side of the stationary cheek E. The end of the cheek E′ is in line with the end of the cheek E, and the cheek E^2 is opposite the ends of E and E′ and it is adjustable by the screws e^3.

The cheeks are of a thickness to allow the letter ends of the types to be above their top surfaces, and these cheeks are adjusted so that the distance between E and E′ corresponds to

the breadth of the body of the type to be acted upon, and the distance between E and E^2 corresponds to the thickness of the type-body and the width of the line of types.

Each type is passed down, base first, between the cheeks E and E′, and by the body-plunger *g* the type is carried along between the cheeks E and E′ and brought up to the side of the cheek E^2, at which moment the running-way *h* comes up against one of its sides and carries the said type along at right angles to its first movement and between the cheek E^2 and the end of the cheek E.

The devices for moving the plungers *g* and running-way *h* are hereinafter described, and we remark that the cheek-pieces are made with hard and smooth surfaces that are parallel to each other, and they straighten the type-body and hold the type in its proper position in relation to the cutters which dress off the burrs at the base of the letter. The cast types are sufficiently accurate in their thickness not to require any metal to be removed from the body portions. The cheek-pieces only smooth and straighten the body portions by contact therewith as the types are pushed along between them.

The cutters are shown at *i i l l*. They are upon the top sides of the cheek-pieces E E′ E^2, and they are each made with a row of cutting-teeth having flat ends, and they are held in place by the screws 5 and adjusted up accurately to place by the screws 6, so that the ends of the last teeth correspond to the surfaces of the cheeks, and they are placed so as to cut away the burrs gradually, the last cutting-edges acting to bring the surfaces of the burrs or letter-bases into line with the surfaces of the type-body. The cutters *l l* act in the same manner as the cutters *i*, but they dress off any burrs or projections at the top and bottom edges of the letter.

The bed C has a groove or slot in line between the cheek-pieces E E′, of a width sufficient to allow the rough part of the base of the type to pass into such slot; but the shoulders or smooth parts of the letter-base rest upon the surface of the bed, and the rough portion of the base where the gate was broken off is removed, and the type channeled by the cutter or fretting-tool 10, that is attached to the under side of the bed, and the cutting-edges project slightly above such bed, as seen in Figs. 7 and 8.

The slots in the bed are shown in Fig. 10, and we remark that it is preferable to employ a pipe, 65, leading from a suitable blower, and nozzles placed over the raceway for the types, by which pulsating currents of air will be directed upon the type, the cheeks, plungers, and cutters to remove any dust or metallic chips and prevent the said particles injuring the machine or adhering to the plungers as they press the type along between the cheek-pieces.

The body-plunger *g* is grooved longitudinally upon its upper and lower edges, as seen in Fig. 9. The groove at the top forms a channel along which dust and particles of metal will pass away, and the groove at the under edge allows the body-plunger to pass along over the cutter 10 without touching the same. This plunger *g* is attached to the stock *g′* beneath the bed, and such stock has a dovetailed body within the stationary slide g^2, that is formed with or attached to the bed C. The stud g^3 projects from the stock through a slot in g^2 and receives the link g^4, connected to the lever g^5, and this lever g^5 is pivoted at g^6 and receives its motion at the proper time and of the desired extent from the cam K upon the driving-shaft L.

The stud or roller g^8 upon the lever g^5 enters the groove of the cam K, and the shank of the stud that passes into such lever g^5 is adjustable toward or from the fulcrum of the lever in order that the amount of motion given to the body-plunger *g* may be varied to suit the thickness of the types and for compensating for wear. This adjustment may be effected in any desired manner. We have shown by dotted lines, Fig. 2, the shank of the stud within an elongated hole and screws at opposite sides to clamp and adjust the stud.

The pusher *h* is similarly mounted, its stock *h′* sliding in the bar h^2 at the under side of the bed C and receiving the proper motion from the cam H^4, upon the driving-shaft L, acting upon the lever h^3, that is pivoted at h^5 and provided with a link, h^6, connected to the stock *h′*. The pivot h^5 is upon a block, *h″*, that is clamped upon the rod h^8, which block can be moved along upon such rod for adjusting the pusher *h*, in order that its end may be in its proper position to act upon the types as presented to it. Wear is also compensated for by this adjustment.

Upon reference to Figs. 2 and 7 it will be seen that the bed C is at an inclination and that the slide D, down which the types are fed, one at a time, is also at an inclination; but it is at right angles to the bed C, so that the types, as they pass down the feeding-channel, slide across the end of the body-plunger *g*. It is necessary to allow the type to pass down after the body-plunger has been drawn backwardly and downwardly. To do this, the type is held, until the proper moment arrives by any suitable detainer. We have shown two forms of this detainer, one in Fig. 11 and the other in Figs. 13, 14, and 15.

There are fences *q q′* upon the plate D, and these are adjustable by screws passing through slots, so that these can be varied according to the height of the letter. The plate D is notched, and the body-plunger *g* moves back and forth in the notch. There is a friction-finger, *r*, that passes in through a mortise in the fence *q′*, and this is supported so that it can slide freely back and forth.

The stock *r′* upon the bed C holds the rock-shaft r^2, at one end of which is an arm, r^3, resting upon the body-plunger *g* near the rear end. (See Figs. 2 and 11.) At the other end

of the rock-shaft r^2 there is a crank, r^8, the pin of which passes through a hole in the plate D and acts against the friction-finger r to move it toward the stationary fence q, and the spring 20 tends to move the finger in the same direction. Upon the top edge of the body-plunger there is a depression at r^4, Figs. 2 and 7.

When the body-plunger g reaches its extreme forward and upward movement, the cam portion r^5 raises the arm r^3 and swings the rock-shaft and draws back the finger r and allows the types to slide down the feeding-slide, the bottom of the lowest type resting upon such body-plunger g. As soon as the body-pusher commences to draw backwardly and downwardly, the cam r^5 draws from under r^3, and the spring 20 presses the finger r upon the second type in the feeding-slide holding the same, and when the body-pusher has drawn entirely back the lowest type slips down in front of its end to be carried by such pusher in between the cheek-pieces E and E′ and be dressed, as aforesaid, and the operations are repeated. We, however, prefer to provide a double-acting detaining-finger. (Shown in Figs. 13, 14, and 15.) In these figures the finger r is pivoted at s and provided with a tail, s', coming around to the feeding-slide s^8, so that when the friction-finger r is drawn back, as before described, by the rock-shaft r^2 and arm r^3 the tail-piece s' is moved into the feeding-slide and catches the lower end of the type as it falls after being liberated by the backward movement of the finger r, and thereby the tail s' holds up or supports the type, and its lower edge does not rest upon the top edge of the body-plunger g. In this form the portion s^3, Figs. 2 and 7, of the plunger g acts as a cam on the backward movement of said plunger to cause the finger r to drop a type and the tail s' to pass below and catch it, and then the tail moves back as the finger r is again made to hold the second type in the feeding-slide, and the tail s' drops the type in front of the plunger just as it comes up to it.

The spring s^4 bears frictionally on the side of the finger r to steady the same in its movements, and the gate t, pivoted at t', hangs with its flange t^2 in proximity to the type as it slides down beneath such flange to prevent the type jumping out of its place in the feed-slide. The screw t^3, through t, adjusts its position, so that the edge of the flange t^2 will not obstruct the type in its movement.

In delivering the type from the machine the plunger h carries such type to the extreme corner of the cheek-piece E, where it descends into the curved raceway u between the quarter-circle block u' and similar fence, u^2, and it is carried away upon a rule or galley, u^3, which is horizontal; but in consequence of the table c being at an angle the types lie in the angle of the rule u^3. (See Fig. 16.) The under surface of this quarter-circle fence u^2 is not in contact with the bed C, but is supported by the cheek-piece E, so that there is a cut-away portion, u^4, through which metallic particles or chips can escape, and the bed C is channeled at u^8 at the bottom of the curved raceway u, as seen in Figs. 10 and 12, such channel having an inclined bottom that rises up to the surface of the bed C, the object of this channel being to prevent any friction on the base of the type by its touching the bed as the types are discharged from between E and E^2 and pass down into the curved raceway u and around through the curved raceway to the rule or galley.

There is a cam, v, upon the shaft L, which acts upon the lever v', pivoted at v^2, and at the upper end of the lever is the pushing-blade v^3, that passes through a slot in the bed C and extends above such bed, and this pusher is at the end of the cheek-piece E^2, and it is so timed and acted upon by the cam v that it comes against and presses upon the type immediately after being delivered from between E and E^2, and the type is carried down until its upper surface is in line with the end of the cheek-piece E, so that the next type will pass freely out over such type.

The lower edge of the concave type-guide u^2, next to the bed C, is cut away, as seen at u^4 in Fig. 12, so that any dust upon the types may be blown down and pass away through such opening instead of being carried along with the types.

The rule w^3 is connected to the side of the bed C by a bolt, w, and there is a stop, 25, upon which the flange of the rule rests to hold it in position for receiving the types. The rule preferably has a rectangular recess to receive the movable stick 21, of wood or metal, so that this can be taken out when full of types and another substituted. The bolt w also forms a pivot, so that a metal rule, 23, (shown by dotted lines in Fig. 16,) may be laid upon the line of types and the rules given a half-revolution to invert them and cause the rule 23 to be below the rule w^3, and hence receive the type, and in which they are conveyed away from the machine, after which the rule w^3 is turned back to its normal position.

In order to prevent undue pressure or concussion upon the type by the body-plunger g, when one side of such type comes up against the side of the fence E^2 we make use of a screw which limits the movement in this direction of the stock g' of said body-pusher g.

It is convenient to provide a block, 30, at one side of the stock g', and to place a lever, 31, beneath the bed C. The block 30 stops against this lever, and the screw 32 is used to adjust this lever for the purposes aforesaid.

We claim as our invention—

1. The combination of the bed C, the stationary cheek-piece E, the movable cheek-pieces E′ E^2, all having smooth flat surfaces between which the types are moved, and means for adjusting and holding the movable cheek-pieces, the cutters fastened upon the top surfaces of the cheek-pieces, the pushers act-

ing at right angles to each other, and the mechanism for actuating the same, substantially as set forth.

2. The combination, with the inclined bed, the cheek-pieces, the cutters, and the pushers, of a feeding-slide at right angles to the inclined bed for feeding the types into the channel between the cheek-pieces, substantially as set forth.

3. The combination, in a type-rubbing machine, of an inclined bed, cheek-pieces, cutters and pushers, a feeding-slide at right angles to the bed, and a spring detaining-finger, and means for drawing back such finger and allowing the types to feed, substantially as set forth.

4. The combination, in a type-rubbing machine, of an inclined feeding-slide and a horizontal table to receive the type, and having an opening in it and a fence with an angle adjacent to the opening and against which the gate or sprue is broken off as the type is moved by hand on the table, substantially as set forth.

5. The combination, with the inclined feeding slide, of a frictional detaining-finger having a tail for supporting the type, and means, substantially as set forth, for giving motion to the finger, as specified.

6. The combination, with the feeding-slide and yielding-finger, of a hinged gate and its flange and adjusting-screw, substantially as set forth.

7. The combination, with the feeding-slide, of the body-plunger, the yielding detaining-finger, and the hinged gate, substantially as set forth.

Signed by us this 23d day of November, A. D. 1885.

GEO. S. EATON.
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Witnesses:
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