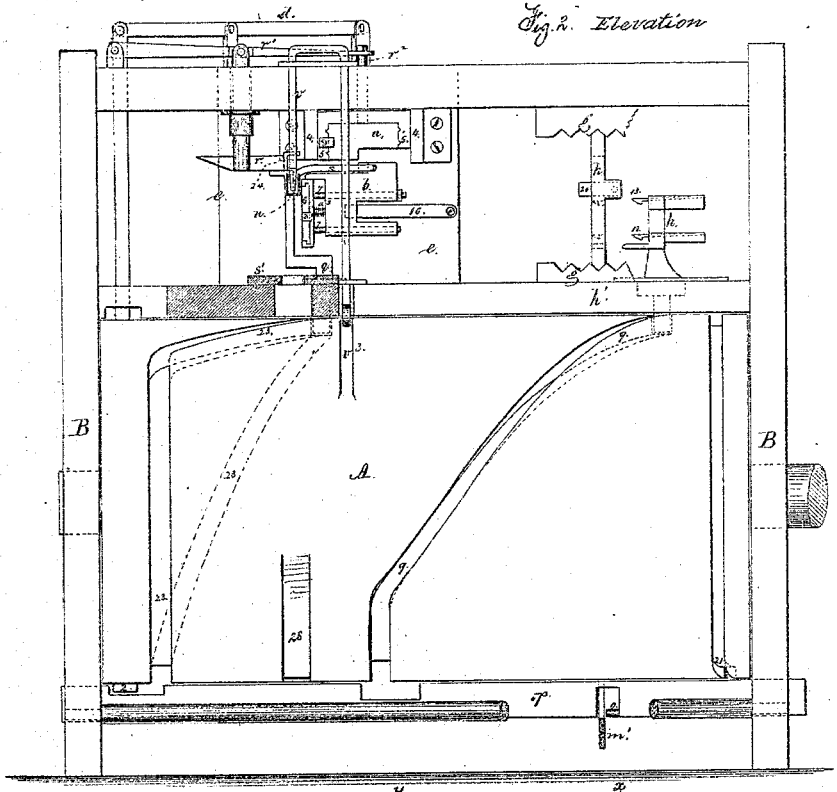
3 Sheets--Sheet 1.

CHARLES S. WESTCOTT.

Improvement in Type Composing and Casting Machines Combined.

No. 115,796. Patented June 6, 1871

Fig. 2. Elevation



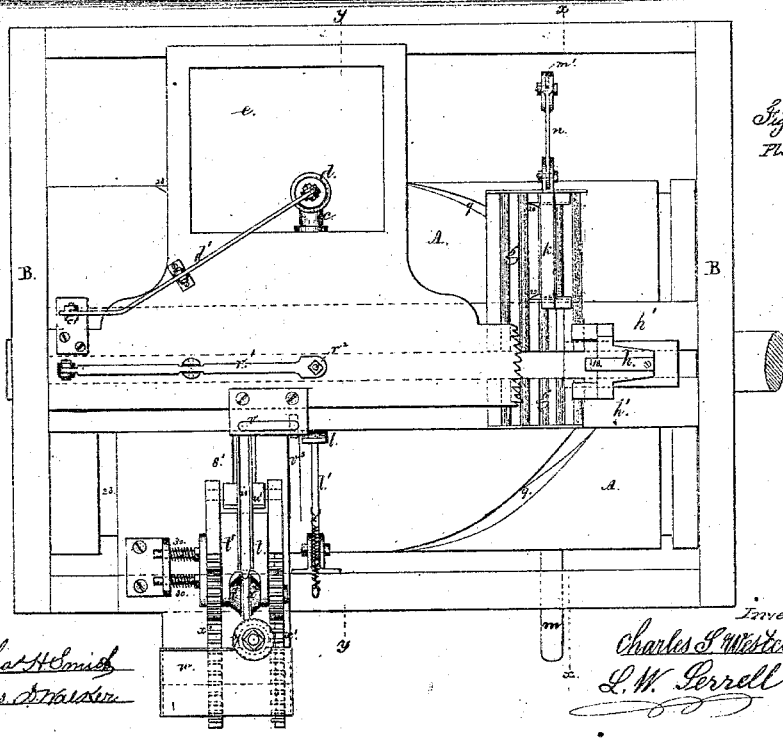


Fig. 1. Plan

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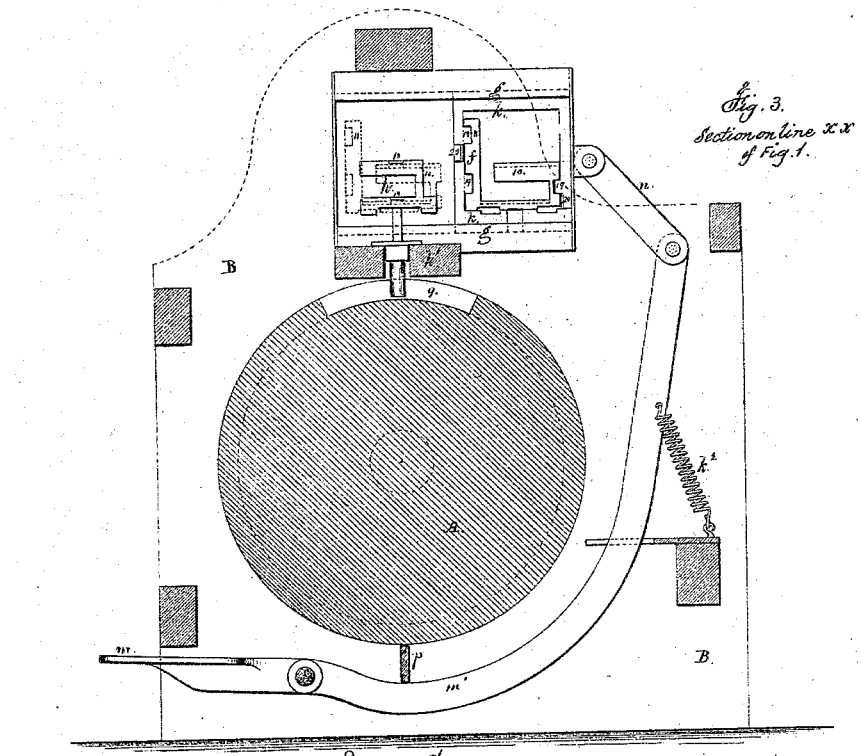

Fig. 3.
Section on line x x of Fig. 1.

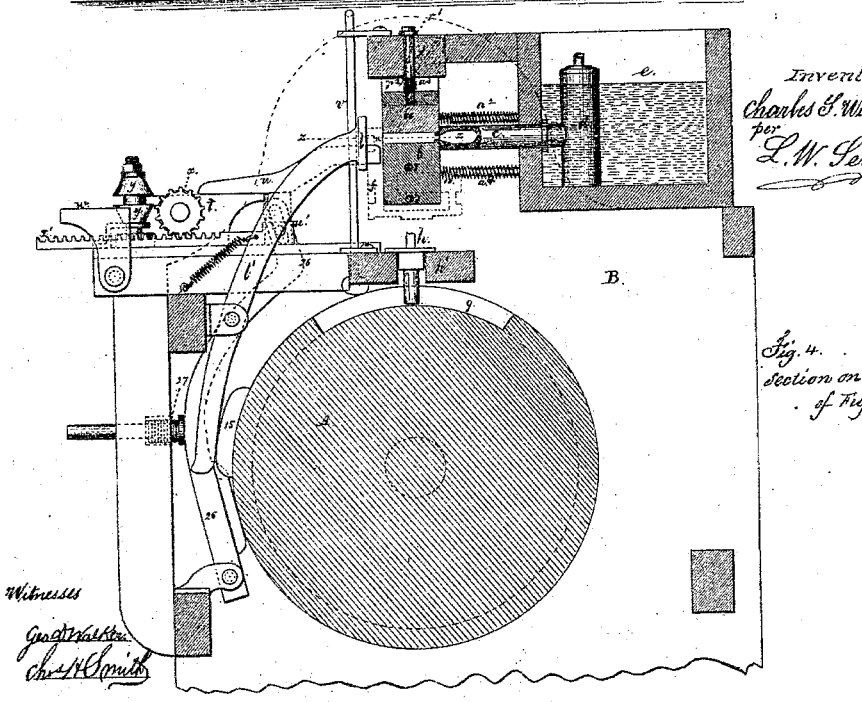

Fig. 4.
Section on line y y of Fig. 1.

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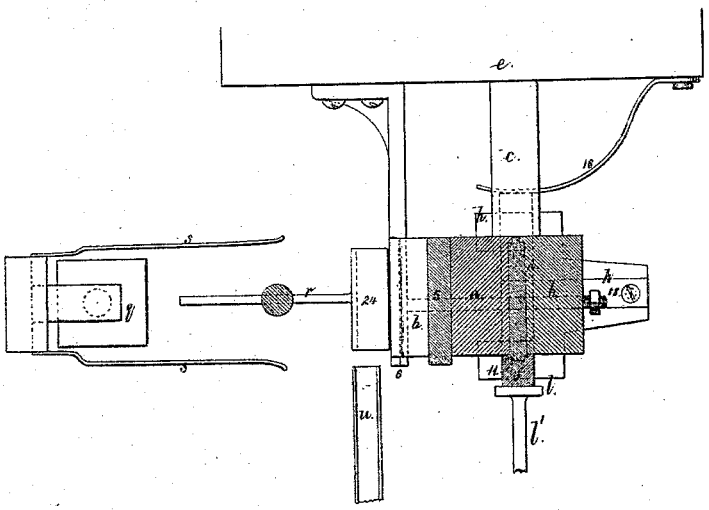
Fig. 5.
(Enlarged.)
on line x x of Fig 4



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UNITED STATES PATENT OFFICE.

CHARLES S. WESTCOTT, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO WESTCOTT'S TYPE-SETTING COMPANY, OF NEW YORK CITY.

IMPROVEMENT IN TYPE COMPOSING AND CASTING MACHINES COMBINED.

Specification forming part of Letters Patent No. 115,796, dated June 6, 1871.

To all whom it may concern:

Be it known that I, CHARLES S. WESTCOTT, of Elizabeth, in the county of Union and State of New Jersey, have invented an Improvement in Composing Types for Printing, and the following is declared to be a correct description thereof.

The object of this invention is to cast, dress, and set up type in a continuous line for solid matter or book or newspaper work, the line being afterward divided off, justified, and set up into column, as usual.

By pursuing this course the form is always composed of new types, and hence the printing or stereotyping will be perfect and the mass of types will be simply remelted instead of the expense of distribution being incurred. The mold in which the types are cast is connected with the bath of molten metal and pump as usual, but the mold receives two motions, one for opening the same the distance necessary for making the body of the type of the proper thickness for the letter to be cast; the other motion is for opening the mold to allow the type to be removed by fingers and deposited upon an inclined chute, down which it is passed to a receiving-jaw, carrying tools for dressing off the bur of the letter as the type is pressed endwise through between such tools. The thickness of the body of the types determines the points at which the cutters act upon the type. The letter is made by a movable matrix that is brought up to place by a slide held while the casting is being made and then moved back to its normal position, the parts being constructed so that one matrix cannot be moved out of its normal position until after the previous matrix has been returned to place.

In the drawing, Figure 1 is a general plan of my machine, parts thereof, however, being in section; Fig. 2 is an elevation of the actuating-cam and parts connected therewith, the parts of the machine in front of the cam being removed; Fig. 3 is a section at the line *x x;* and Fig. 4 is a section at the line *y y*. Fig. 5 is a section at the line *z z*, Fig. 4, and the parts are shown in about full size.

The main actuating device of this machine is a cylinder, A, mounted in frames B B, and actuated by competent power, and in or upon this cylinder are the cam-grooves or projections that are required for actuating most of the parts of the machine, so that a type will be made and delivered each revolution of the said cylinder A. The mold in which the type is cast is made of the two parts *a* and *b*, set in slides in front of the nozzle *c*, through which the melted metal is forced by the pump *d*, in the pot or bath *e* of type-metal, said bath being heated by gas or otherwise; and the pump is operated by the lever *d'* and a cam, 2, upon A, that is shaped and positioned to give the movement at the proper time, and the motion is sufficient to supply melted metal for the largest type; and in casting smaller type the surplus metal is to be allowed to escape into the bath again through a safety-valve or similar appliance. The upper half *a* of the mold is set in stationary exterior slides 4, that allow of a vertical movement, and within these are the secondary slides 5, that allow the mold proper to receive a movement toward the nozzle *c*, there being springs a^2 a^3 which return the parts to the normal position by pressing the mold down and also away from the nozzle *c*. The lower half *b* of the mold is also in slides, the slides 6 allowing of a movement toward the nozzle *c;* and the mold is also set upon studs or guides 7, one of which is shown as provided with a nut at its end to limit the amount of movement of the mold *b* in a direction parallel to the axis of the cylinder A. Springs a^4 and a^5 are also provided to press the mold *b* away from the nozzle *c* and to move it away from the slide 6, and hence fully open the mold to a width sufficient for the thickest type-body, the contiguous parts of these molds *a b* being made similar to those in ordinary type-founding machines, where the body of the type is cast in a parallel opening between the right-angle offsets in the faces of the mold. A matrix is provided for each letter, and these are similar to those employed in type-casting machines, and do not need further description. Each matrix is attached to a separate sliding gage, *f*, set in frame *k* in fixed guides *g*. I have shown only a few of these, but it is to be understood that the range is to be extended and to contain as many sliding gauges as there are letters or characters in the machine. A carrier, *h*, set in ways *h'*, and actuated by the

cam-groove 9 in A, is provided for conveying the sliding gage and matrix to the mold *a b*, in the manner hereafter described. The part 10 of the gage *f* varies in thickness according to the letter in the matrix at 11, and the carrier *h* moves along to a definite point each time, and the part 10 intervenes between that and the mold *b;* hence, if the part 10 is of less thickness the mold *b* will not receive as much motion in a direction parallel to the axis of A, and, on the contrary, if the part 10 is of greater thickness the mold *b* will receive a greater movement; therefore the mold can be closed more or less to give the space required for the thickness of body appropriate to the letter in the matrix. The movement that brings the slide-gage *f* up to place and determines the opening between the parts *a b* of the mold for the body of the type also presents the matrix on the slide-gage *f* at the end of that opening, and I make use of a clamp, *l*, on the end of a lever, *l'*, that is actuated by the cam 15 on A, to press the matrix against the end of the opening between the molds *a b*, and slide the whole of the parts endwise sufficient to bring the back ends of the molds *a b* firmly against the nozzle *c*. While in this position the pump *d* is moved, the type cast, and the parts return to their normal position by the action of the springs as the cam 15 passes from under *l'*, and the matrix is thrown off the type by the spring 16 acting against the back end of the guide-slide *f*, and the said guide-slide *f* is taken back to its proper frame *k*, leaving the type in a condition to be taken out of the mold by means hereafter described.

I will now state the means for bringing into position the slide and its matrix according to the letter required. The fixed guides *g* extend on both sides of the opening between the ways *h'*, in which the carrier *h* is moved, so that said carrier is free to be moved along at right angles to said guides *g*. Each frame *k*, in *g*, is made with an opening at the bottom for the passage through it of the carrier *h* when the frame *k* is slid forward by the action of the finger-key *m*, lever *m'*, and link *n* to the said frame *k*. When one of the frames *k* is therefore slid forward it carries the sliding gage *f*, with its matrix, across the path of the carrier *h*, and as that carrier comes up it takes the gage *f* out of the frame *k* and carries it up to the mold *b*, as aforesaid, and then brings it back again, and leaves it in its frame *k*, that has remained in position awaiting its return. Spring catches 18 on the carrier *h*, taking grooves in *f*, steady the gage while in the carrier, but yield as the carrier draws back after redepositing the gage in its frame *k;* and there are stops 19 in said frame that arrest the backward movement of the gage *f*, and spring catches 20 steady the gage *f* in the frame *k*, but yield when the carrier *h* moves the gage toward the type.

It will be evident that the frame *k* must be kept in position to receive the gage on its return movement; also, that the next frame must only be projected when the carrier *h* is furthest away from the mold, for the parts would be broken if a frame and gage were projected behind the carrier. The operator, by care, might effect these movements; but, to avoid risk, I make use of a slide, *p*, going across the keys *m*, and containing a notch for each lever *m'*, with a pin, *o*, that projects above each lever and prevents its being raised except at the completion of the backward movement of the carrier *h*, at which moment the cam portion of the groove 21 draws the bar *p* along, allowing all the levers to be free, and the lever that has been raised by depressing the finger-key is allowed to return to its normal position, the frame *k* being drawn back by the spring k^2, and the operator having his finger upon the key of the kept letter to be composed that is free to be moved by the pin *o* being drawn back from over it, and therefore he brings the next gage and matrix into position; and the bar *p* being again moved its pin *o* passes under the lever *m'* or into a hole or notch, holding the frame *h* in a forward position for the gage and matrix to be taken out by the carrier *h* and then returned, as aforesaid.

I will now return to the type as cast and in the mold, and show the manner of removing the same, dressing, and setting it up. Between the guide-bars *h'* is a slide, *q*, moved at the proper time by a cam-rib or groove, 23, on A; the upper end of this slide *q* runs under the inclined end of the lifter *r*, beneath the lever r^1; and from the moving end of r^1 is a connection, r^2, to the mold *a*, so that by this means the mold *a* is raised sufficiently to allow the type to be taken out bodily and sidewise by the two spring-fingers *s* that extend from the slide *q* and come up at each end of the type, and as the slide *q* goes back the type is carried out of the mold and comes against a stop, 24, that arrests its further movement; but the fingers move on and draw away, so that the type drops into a groove or trough, *u*. The groove or trough *u* is upon the upper end of a carriage, *u'*, that is moved back and forth upon a bed, *s'*, at right angles to *h'*, by means of a lever, 26, spring 27, and cam-groove and projection 28 upon A. A delivering-finger, *v*, should be employed, the same being kept in an elevated position as the trough *u* is moved away from the mold *a b*, and dropped, by a cam-groove, v^3, in A, behind the type, so that as the trough *u* is brought back to receive another type the previously-received type will be moved forward in the trough and run down between the jaws *t t'*. The jaw *t'* is fitted so as to yield laterally, and is to be opened by the backward movement of the carriage *u'*, so as to allow the type to pass freely between *t* and *t'*, and the letter end comes beyond the jaws *t t'*, so that the said jaws can close by the springs 30 upon the sides of the body of type, and the end of the trough terminates between said jaws, so that the type is pushed forward by the movement of said trough *u*,

and the letter end passes between cutters that dress off the bur, and the type is delivered upon the table *w*. I have shown and prefer revolving cutters *x x* and *y y*. These are upon shafts provided with pinions, and extending from the carriage *w'* are rack-bars *x'*, that rotate the respective pinions and cutters when the carriage is being moved. These cutters may be provided with ratchet connections to the pinions, so as only to be turned in one direction by the rack-bars. The line of types lying upon the table *w* is to be pushed along by a reciprocating pusher, each additional type, so as to give room for the next type, to pass out upon the table.

I remark that the cutters *y y* are to be set at the proper distance to remove any bur at the top or bottom of the letter, and only require adjusting when the machine is changed for different fonts of type, while the cutter *x x*, standing on line with the faces of the jaws *t t'*, act to remove any burs projecting beyond the sides of the bodies of the types, and the apparatus is self-adjusting to accommodate the different thicknesses of type-bodies. By changing the molds, matrix, or sliding gage, this machine may be adapted to differences in the font of type to be made use of. The line of types is to be separated and justified in any usual or desired manner, as it is set up into column or page to be printed from, and ordinary types may be introduced to supply capitals, numerals, or other characters that may not be provided for in the machine. After the form of type has been printed from, or used for stereotyping or electrotyping, it is to be remelted, thereby saving the cost of distribution.

I claim as my invention—

1. The combination of type composing and casting mechanism, substantially as set forth, so that the matrix will be presented and the type cast in the order in which they are composed or set up in line, substantially as specified.

2. Automatic self-adjusting mechanism for dressing types of various thicknesses, in combination with casting and composing mechanism, substantially as set forth.

3. Type casting, dressing, and composing mechanism, arranged substantially as shown, in combination with a cylinder containing cam-ribs or grooves to communicate the respective movements at the proper time, as set forth.

4. A reciprocating carrier and a sliding gage and matrix combined with the type-molds *a* and *b*, substantially as and for the purposes set forth.

5. The frames *k*, gages *f*, and slides *g*, arranged at right angles to the slide-bars *h'*, in combination with the carrier *h*, the parts being constructed and actuated substantially as set forth.

6. The locking-bar *p*, in combination with the keys *m*, levers *m'*, frames *k*, and slides *g*, as and for the purposes set forth.

7. The delivery-fingers *s* and stop 24, in combination with the mold *a b* and trough *u*, substantially as and for the purposes set forth.

8. The jaws *t t'* and cutters *x x y y*, in combination with mechanism for pushing the type endwise between such cutters, substantially as set forth.

Signed by me this 28th day of December, A. D. 1870.

C. S. WESTCOTT.

Witnesses:

CHAS. H. SMITH.

GEO. T. PINCKNEY,