

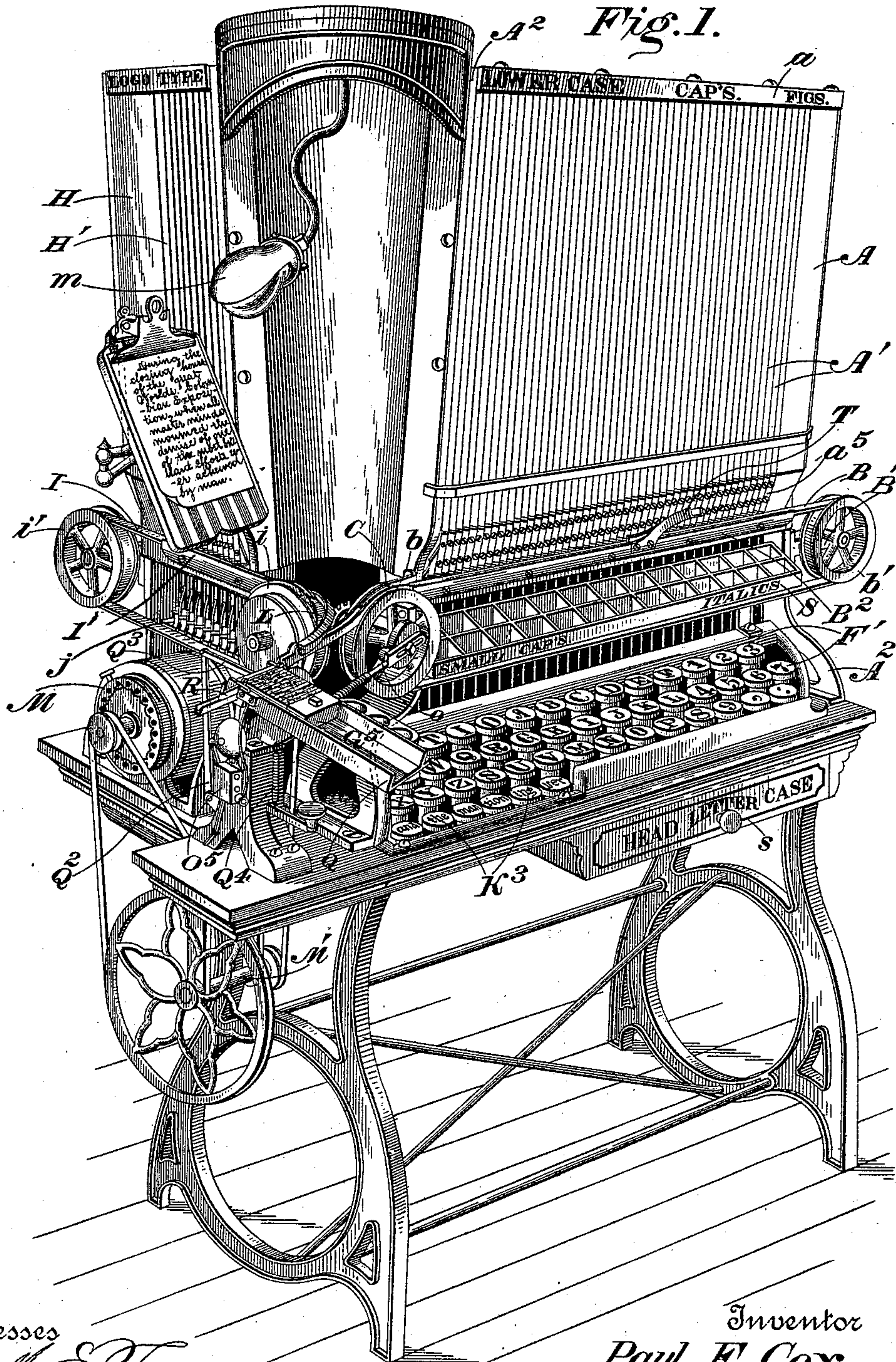
(No Model.)

4 Sheets—Sheet 1.

P. F. COX.  
TYPE SETTING MACHINE.

No. 528,856.

Patented Nov. 6, 1894.



Witnesses

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Inventor

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Attorneys.



(No Model.)

4 Sheets—Sheet 2.

P. F. COX.  
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Fig. 2.

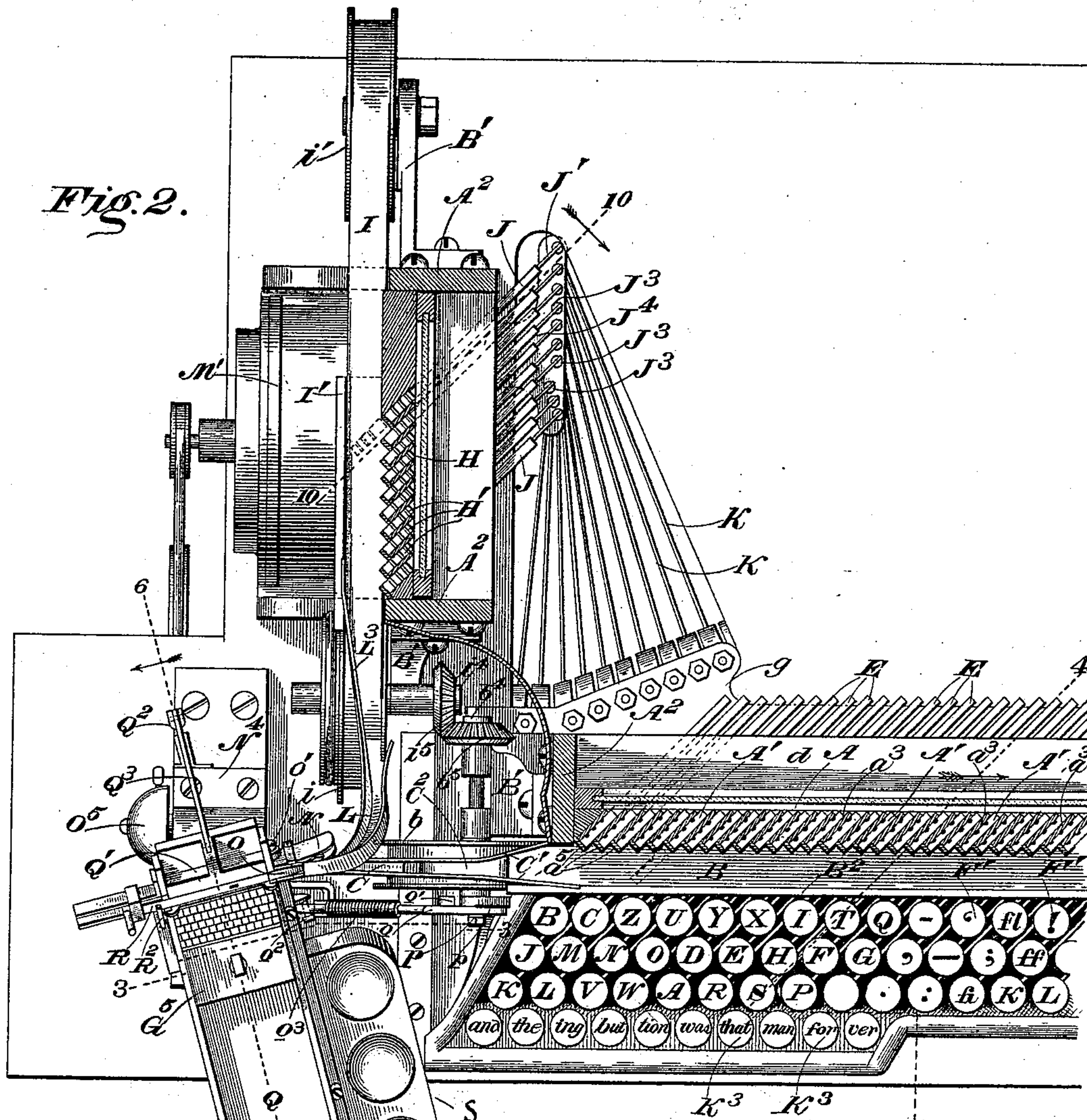
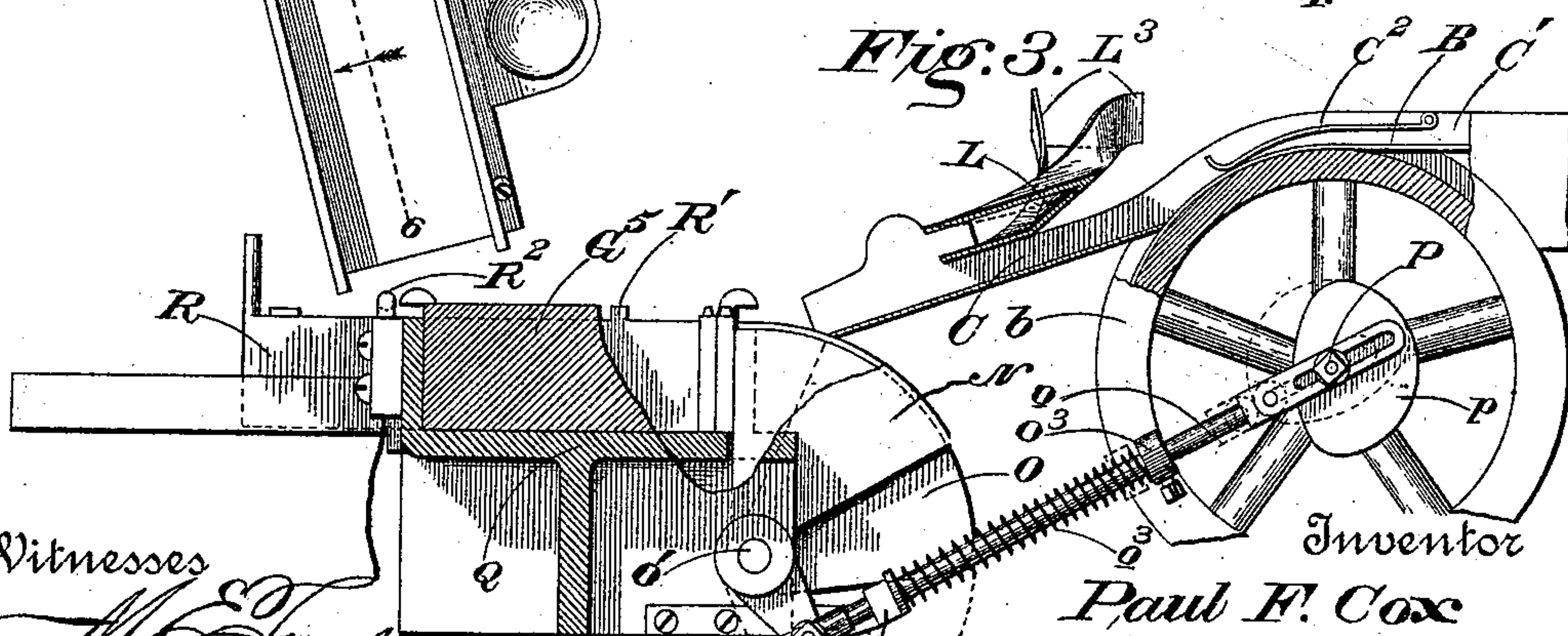


Fig. 3. L<sup>3</sup>



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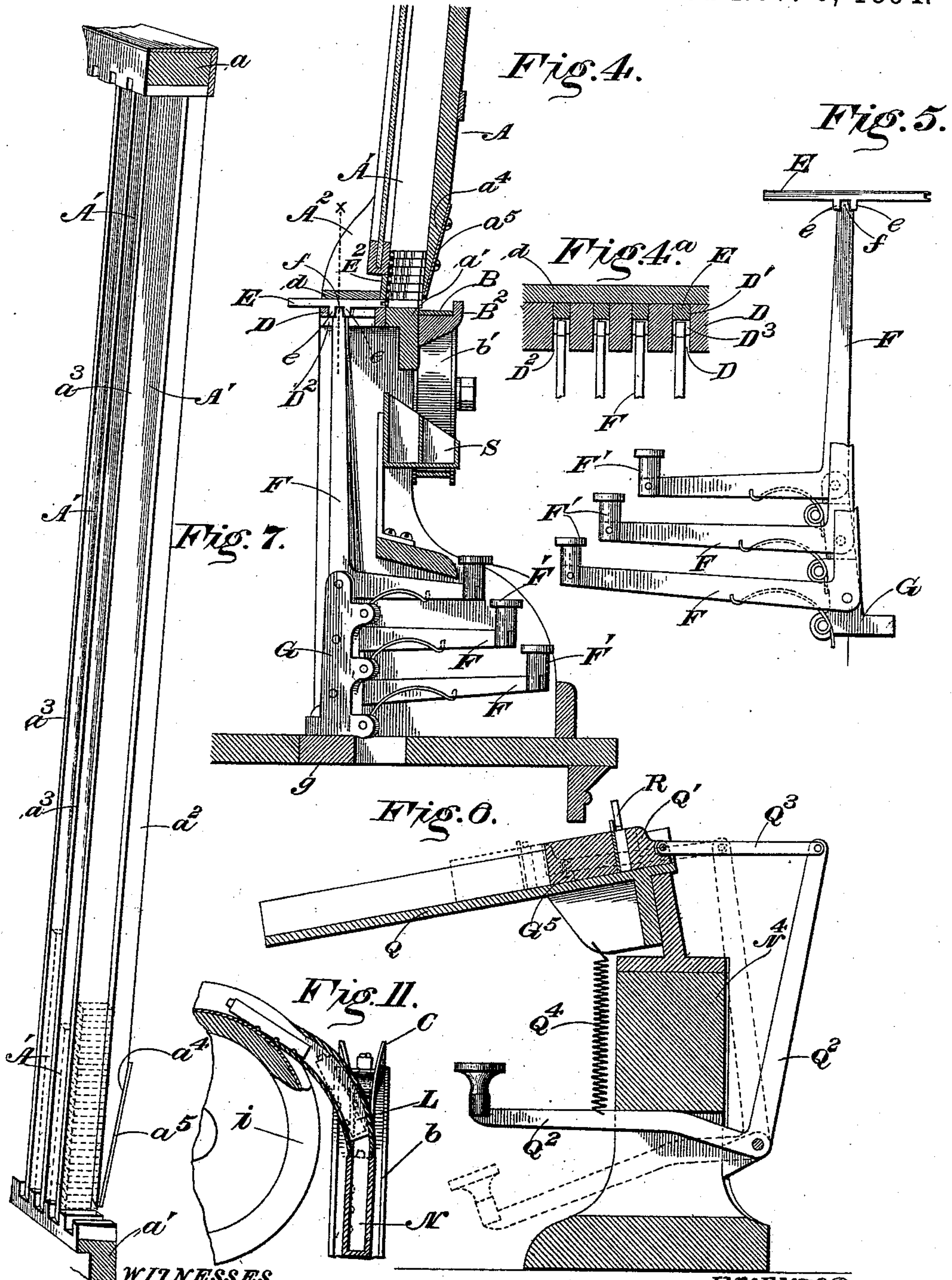
(No Model.)

4 Sheets—Sheet 3.

P. F. COX.  
TYPE SETTING MACHINE.

No. 528,856.

Patented Nov. 6, 1894.



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(No Model.)

4 Sheets—Sheet 4.

P. F. COX.  
TYPE SETTING MACHINE.

No. 528,856.

Patented Nov. 6, 1894.

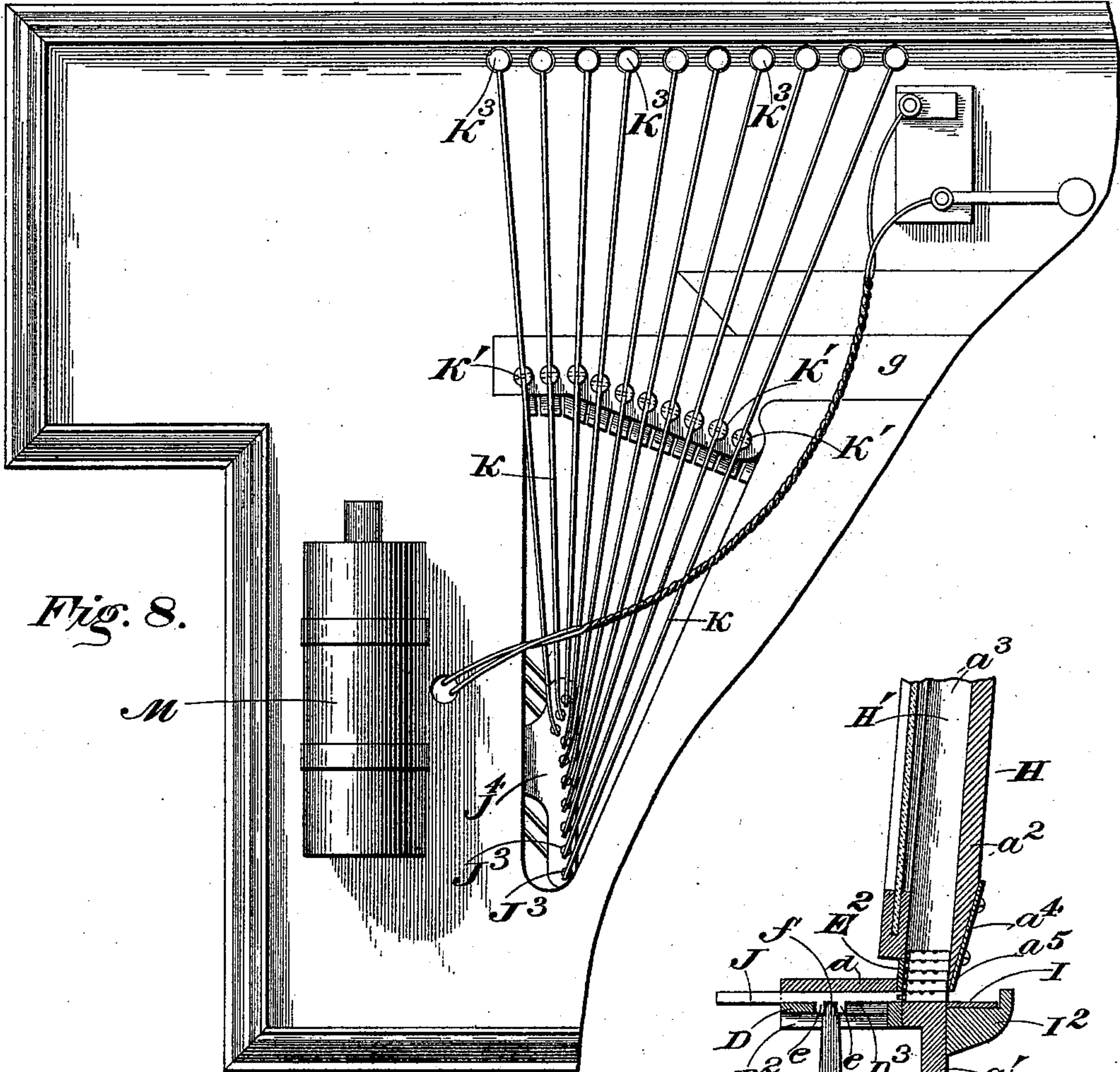


Fig. 8.

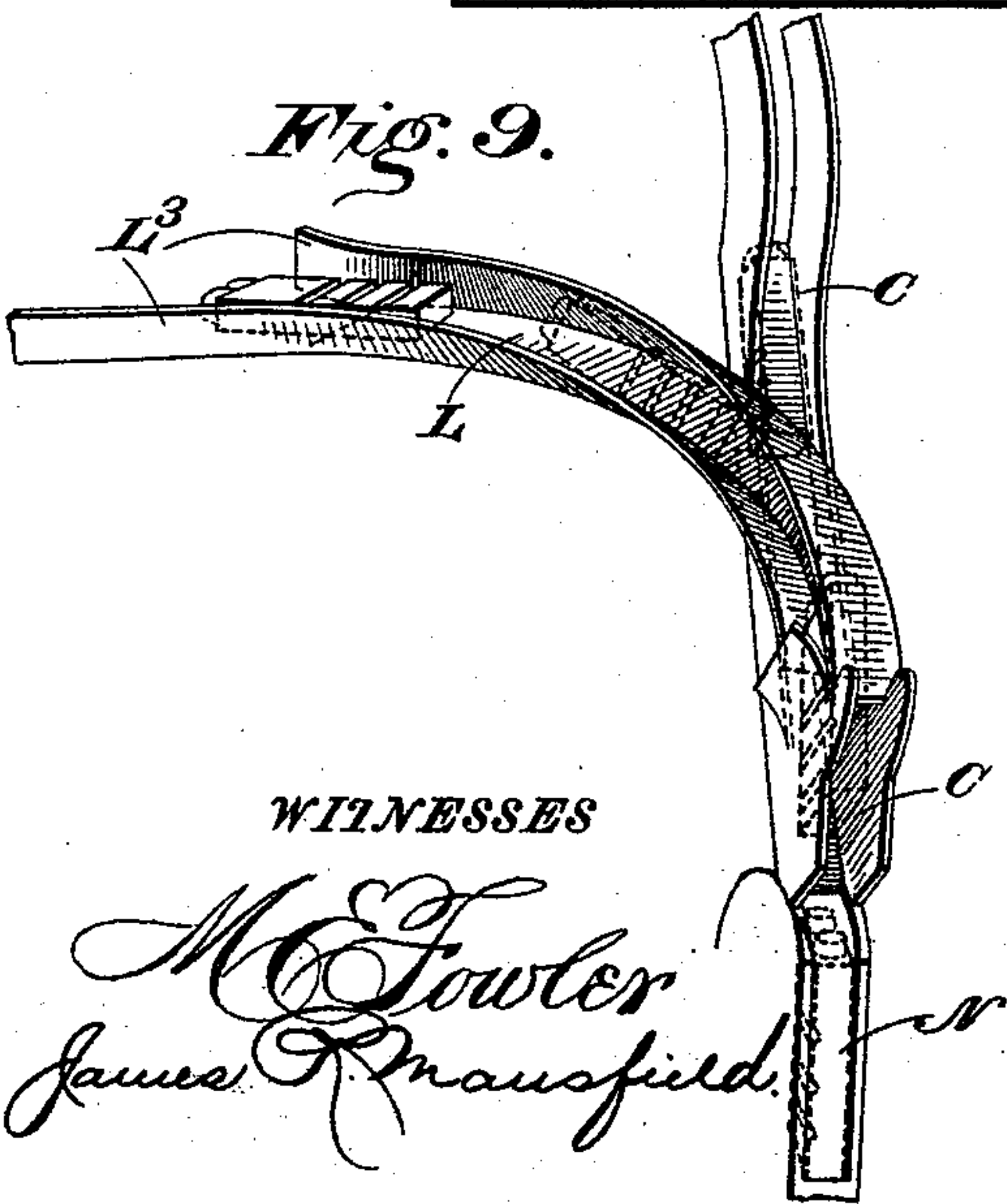


Fig. 9.

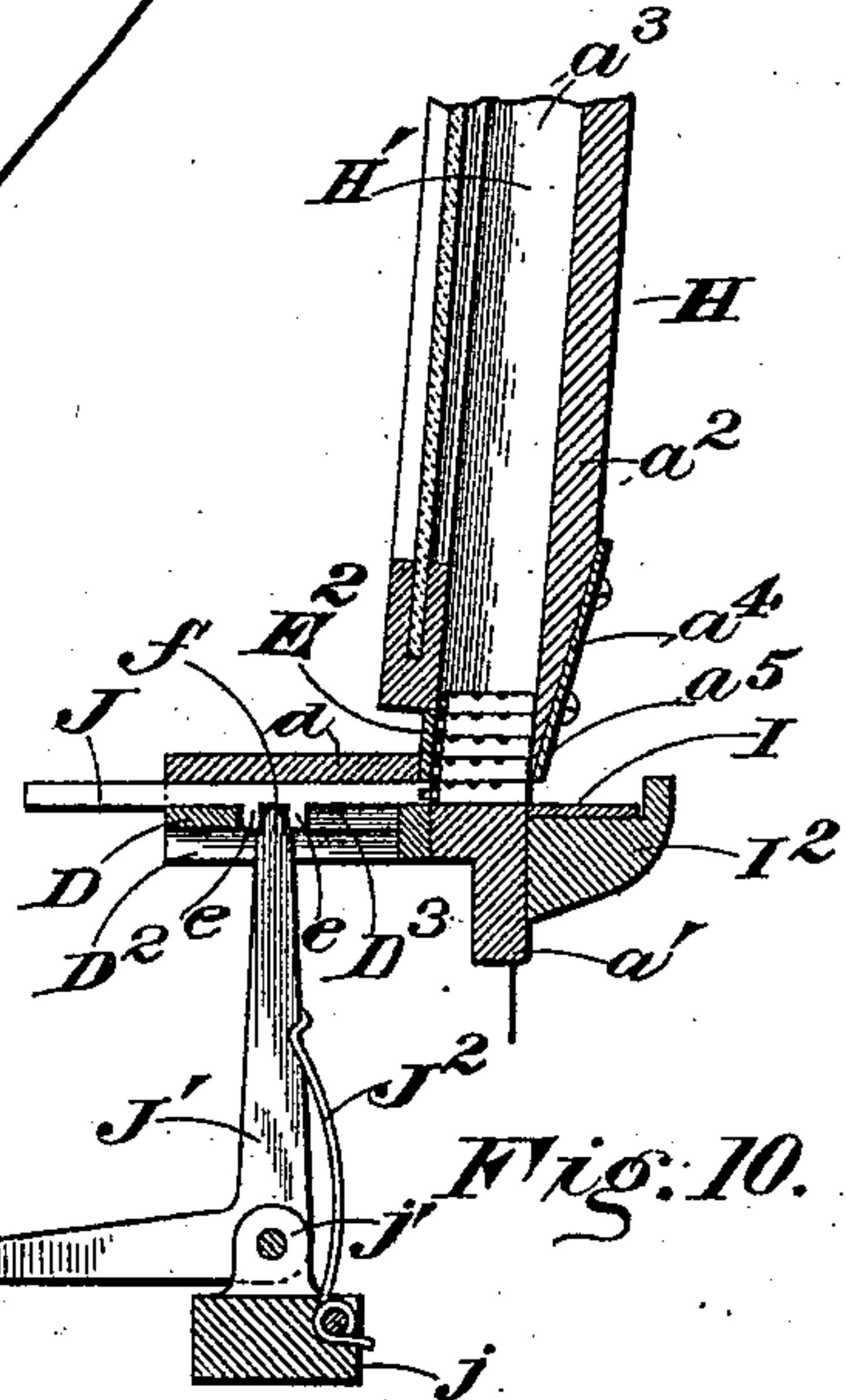


Fig. 10.

WITNESSES

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# UNITED STATES PATENT OFFICE.

PAUL F. COX, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO THE COX TYPE  
SETTING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

## TYPE-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 528,856, dated November 6, 1894.

Application filed March 2, 1894. Serial No. 502,099. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL F. COX, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Type-Setting Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My present invention is an improved type setting machine, and my object is to produce an efficient, speedy, reliable, simple, durable and inexpensive machine.

In my invention I combine logography and machine type-setting thereby greatly increasing speed of composition. Not only do I employ common printers' type and logo-types, but I also employ logo-types of syllables and words most frequently used in ordinary speech and writing, such as "tion" "ing" "the" "and" "that," &c., and one of the important features of my machine is that it will automatically set and align such logo-types and ordinary types notwithstanding the greater width of the new logo types over the font type and logo-type heretofore used. The ordinary font logo-types are made on an ordinary sized body, not exceeding an "em" body, and can therefore be handled in some previously invented type setting machines, but the new word logo-types which I employ are necessarily on larger bodies, sometimes several times wider than "em" bodies, but of the same height and thickness, so that they can be composed and associated with the ordinary type.

Hereinafter by "logotype" I refer to word or syllable "logotypes."

The invention therefore consists, first, in mechanism whereby logo-types and ordinary types, can be set by the same machine, and the largest logotype handled in the same time and manner as the smallest type or space, the types and logotypes alternating irregularly in the composed matter according to the diction of the article being set up; second, in arranging the type channels or reservoirs in a parallel series, but diagonally, that is, each channel stands diagonal to and beside

the type carrier, which lies parallel with and just below the series of channels so that the types can be ejected directly onto the carrier and substantially in the direction of movement of said carrier from said channels without intermediate directing mechanism; third, in arranging two series of channels with their respective carriers, at angles to each other, and providing means whereby both carriers deliver types to a common assembling race way, without interference; fourth, in the employment of two series of channels, and independent carriers therefor, one set of channels being filled with ordinary types adapted to be ejected upon the adjoining carrier, and the other set being filled with logotypes adapted to be ejected upon the other carrier, with means for partially turning the logotypes prior to their entrance into the common race way, so that the logotypes and types will line up properly; fifth, in novel and simple key mechanism for ejecting the type from the channels; sixth, in improved mechanism for setting and moving the type characters into the race way, or galley; seventh, in novel constructions, and combinations of parts in detail.

The following description in connection with the drawings will enable others to construct and use the machine.

Figure 1 is a perspective view of the machine complete. Fig. 2 is a horizontal sectional view of the left hand end of the machine, taken just above the carrier belts. Fig. 3 is a detail transverse sectional view taken through line 3—3 of Fig. 2. Fig. 4 is a vertical transverse sectional view taken through line 4—4 of Fig. 2. Fig. 4<sup>a</sup> is a detail sectional view on line *x—x* of Fig. 4. Fig. 5 is a side elevation of three of the ejector levers and their support. Fig. 6 is a vertical longitudinal sectional view on line 6—6 of Fig. 2. Fig. 7 is a detail perspective view of several of the type channels detached. Fig. 8 is a reverse plan view of left hand end of machine. Fig. 9 is a detail perspective view of the chutes. Fig. 10 is a vertical transverse sectional view on line 10—10 of Fig. 2. Fig. 11 is a detail view of a modification of the type assembling chutes.



The operative parts of the machine are all mounted upon a stand or other suitable support. The key board consists of several parallel rows of independent keys, each key representing a type character, space, or logotype. Above this key board is a type reservoir formed of substantially vertical channels, slightly inclined forward adapted to hold the type characters corresponding to the keys, and between the keyboard and channels is a horizontal endless carrier belt upon which the types are ejected directly from the channels by the action of ejectors (one for each channel) operated directly from the key board, by means of angular key levers pivoted below the channels, one end of each lever carrying the finger key, the other end directly engaged with an ejector avoiding all small screws and rivets.

The carrier belt conveys the type to a chute, through which it drops into a race way, or galley, the types being set up and pushed forward in the chute by means of a spring actuated setter and the galley has an electrical alarm by which the operator is notified, when the proper number of type to form a line are pushed forward to move such line out of the way for justification in the galley. At one end of the first type reservoir, is another of similar construction, standing at about right angles to the other, and provided with a similar carrier belt, running at right angles to the other, and adapted to deliver the type (or logotypes), into a chute which in the machine shown is twisted so as to turn the type into line with those delivered by the first carrier belt and drop them into the race way just in front of the setter so that the types and logotypes can be set up in line without hindering the action of the machine. The ejectors in the second reservoir are operated by connections from the key board, much like those of the first reservoir.

The corner space between the two reservoirs can be filled with a metallic reflector, and a copy holder attached to the end reservoir so that the operator, who sits near the end of the machine, can have this copy in sight, and be in convenient reach of the key board, and the galley. The belts are driven by a small electric motor upon the stand of the machine, and the same current which runs the motor is utilized to supply light for the operator.

I will now describe the various elemental parts of the machine in detail, beginning with—

*The type reservoir.*—The type reservoir A stands above the keyboard and carrier belt, and is arranged substantially vertical, or sufficiently inclined to prevent the type tilting out of the channels. This reservoir is formed with a number of vertical parallel channels A' one for each type character employed, and of course varying in size according to the fonts of type which the machine is de-

signed to handle. Each channel is adapted to contain types laid flatwise (or sidewise) one upon another. The channels are diagonally arranged, as respects the face of the reservoir, standing at about an angle of forty-five degrees to the carrier belt B which runs longitudinally of the reservoir just beside the lower ends of the channels, as shown, and its upper side moves in the direction toward which the channels are inclined so that the types ejected from the channels will be given an initial movement by the ejector substantially in the direction they will be taken by the belt, and thus the movement of the type is toward the race way from the time it is given an initial movement by the ejector until it is delivered to the race way chute by the belt. Channels A' may be open at top, and rear for the insertion of the types, but the manner of and means for introducing the types into the channels form no part of the present invention.

The reservoir as shown, is constructed of parallel top and bottom bars  $a, a'$ , rigidly connected to suitable uprights  $A^2$ , at each end of the reservoir. In the opposed faces of said bars are formed a series of diagonal parallel grooves in which are fitted the ends of vertical strips  $a^2$ . These strips are of such width at front, that they abut, but are reduced in thickness at the rear on one side, leaving a thin longitudinal portion  $a^3$ , and the spaces between portions  $a^3$  of adjoining strips are the channels A'. The lower front edges of strips  $a^2$  are beveled off as at  $a^4$  so that only the thin portion  $a^3$  is left at bottom, and to the beveled faces of the strips are attached gates  $a^5$ , which may be formed of spring brass, steel, or any suitable metal and secured to the strips by screws, or otherwise. The gates are so adjusted that the space between the lower end of gate and face of bar  $a'$  (or bottom of channel A') is just sufficient to permit the passage of one type character, contained in the channel, at a time. The gate may be made vertically adjustable, as by slotting the holes for the passage of the screws, or in other suitable manner, so that they can be raised to allow a wrong sized type to be removed from the channel.

*The carrier belt.*—The carrier B is an endless belt, running over pulleys  $b, b'$ , journaled in brackets B' secured to uprights  $A^2$  at opposite ends of the reservoir A. The upper portion of said belt lies parallel with and just below the channels and is guided and supported by an underlying flanged bracket B<sup>2</sup> attached to or formed on the lower bar  $a'$ . This flanged bar extends the length of the reservoir, and forms a race in which the types are contained, and through which they are carried by the belt.

At the left, or galley, end of the machine shown, toward which the upper portion of belt B moves, is a chute C, longitudinally in line with the belt, and into which the types are delivered by the belt, being switched off



the latter by switch strips  $C'$ ,  $C'$  attached to the upper end of the chute, and fitting closely over the portion of the belt above wheel  $b$ , the ends of said switch strips diverging to opposite sides of the belt and secured to opposite sides of the race, as indicated, so as not to obstruct the movement of the belt, and yet insure the entrance of the types into the chute. A tongue  $C^2$  pivoted between arms  $C'$  over the belt, prevents the types being thrown over the end of the chute as they pass over the crown of the wheel  $b$ . The chute delivers the types to the race-way or galley, as hereinafter described.

*The ejectors, and key connections.*—Behind the reservoir, parallel with bar  $a'$ , is a bar  $D$ , which is rigidly secured in the frame. In the upper side of this bar are diagonal grooves  $D'$  one for each type channel  $A'$ , exactly in line with the bottom thereof, and on the under side of the bar are a series of diagonal grooves  $D^2$ , one for each groove  $D'$ , and parallel therewith. The pairs of upper and lower grooves  $D'$   $D^2$ , are connected by vertical slots  $D^3$ , as shown.

The ejectors  $E$ , are metal rods lying in and guided by grooves  $D'$ , being reciprocated back and forth. The front ends of said ejectors are adapted to enter the bottom of the relative channel  $A'$ , and to eject therefrom the lowest type, and these ends therefore vary in thickness, according to the width of the type body, so that the ejector will only project one type at a time. Each ejector is formed with two depending lugs  $e$ , which depend through slot  $D^3$ , and consequently limit both the forward and backward movements of the ejector by contact with the end walls of the slot, the slots, however, being made just the proper length to allow the ejector to be moved forward sufficiently to eject a type, and backward sufficiently to allow a fresh type to drop in position for ejection. The inner edges of lugs  $e$  are dressed or milled like rack teeth, and are engaged by the upper end  $f$  (dressed like a cog tooth) of a bell-crank key lever  $F$ , which is pivoted at its bend on a suitable support, below the reservoir, and its horizontal arm extends forward under the reservoir, and on its extremity is fixed a key stem or piece  $F'$  so that by simply rocking lever  $F$  by depressing the finger piece, the ejector is thrown forward, ejecting a type, and when the finger is removed from the key the lever is thrown back by a spring attached to any suitable fixed point and acting against either arm of the lever, thereby retracting the ejector. The upper end  $f$  of the lever is guided in groove  $D^2$  and slot  $D^3$ , so that it cannot disengage the lugs on the ejector, and all the ejectors are held down in grooves  $D'$  by a longitudinal bar  $d$ , overlying bar  $D$  and secured by set screws. By this construction the ejector is operated directly by the key lever, without the employment of rivets or screw connections, and when bar  $d$  is removed any ejection

can be lifted out of place and replaced at will, without disturbing others. The simplicity and effectiveness of this connection will be apparent from the drawings.

A guard strip  $E^2$  is secured over the ends of the ejectors, just in rear of channels  $A'$ , to prevent any type being drawn backward out of the channels when the ejectors are retracted.

In the drawings the key-levers  $F$ , are arranged in tiers, and have arms of different lengths. Three levers are pivoted to a single support.  $G$  the largest lever is pivoted to the side of the support, near the bottom thereof. Above this pivot the lever is reduced in thickness and the second smaller lever is pivoted thereto, and above the second lever's pivot the support is still further reduced, and the third smallest lever is pivoted thereon. Thus the levers are rested one above the other and close together, so that their vertical arms can engage with three adjoining ejectors, while their horizontal arms project outward in a stepped tier and the keys appear arranged in three stepped rows. This construction is very simple, compact and reliable.

The end levers may be pivoted on separate supports as necessarily the levers stand diagonal to the belt, yet this does not affect the appearance of the key board, nor interfere with the close banking thereof. The supports are detachably fastened to a horizontal bar  $g$ , as shown.

*The logo-type handling mechanisms.*—At the left hand end of the machine is another reservoir  $H$ , constructed like reservoir  $A$ , but its chambers  $H'$  are varied in width, according to the width of the logotypes which they are to contain. In the machine shown the logotypes are placed flatwise with the nicks uppermost, and consequently vary in width according to the number of letters in the logotype character. The reservoir  $H$  stands at about right angles to, in rear and to the left of reservoir  $A$ . In front of it is an endless carrier belt  $I$  which runs at right angles to belt  $B$ , over pulleys  $i$ ,  $i'$ , attached to the framing as shown. Pulleys  $i$  and  $b$  stand in the same plane and at right angles to each other, their peripheries almost touching at the corner of the machine, and the upper horizontal portion of belt  $I$  runs over a flanged bracket  $I'$  similar to the bracket  $B^2$ . The logo-types are ejected from channels  $H'$  by ejectors  $J$  mounted in grooved and slotted bars, like the ejectors already described, modified of course to suit the size of logotypes. These ejectors are reciprocated by angular levers  $J'$  pivoted at their bends on lugs  $j'$  formed on a bar  $j$ , secured below the reservoir  $A$ , suitable springs  $J^2$  being arranged to retract the levers and ejectors after they have been forcibly thrust forward. The inner ends of levers  $J'$  are pivotally connected by rods  $J^3$  (playing through suitable guides  $J^4$ ) to the inner ends



of oscillating key levers hung on pivot bolts K' suspended from bar *g*, or other suitable support. Levers K underlie the other levers, and extend beyond the front row of keys, and on their outer ends are secured keys K<sup>3</sup> as shown, which are marked to indicate the logotype which will be ejected upon the depression of such lever.

For convenience in construction the two reservoirs are shown at right angles to each other, but it will be practical to have them at different angles.

In my machine the types are ejected upon a carrier belt with the letter sidewise, but the new logotypes as the machine is shown if ejected upon the belt in this way would be apt to topple over and therefore fail to pass into the delivery channel, or would not align in the race-way. Therefore it is necessary and desirable that the logotypes should be ejected upon the belt with the notches up. Consequently it is necessary to turn them in order to bring them in alignment with the other types in the race way and galley. A decided advantage results from this method of delivering the types and logo-types, as the latter are placed flatwise in the channels, and therefore many more logotypes can be placed in the logotype channels, than if the logotype had to be arranged with nicks on the side, as are the other types. Therefore the type channels would have to be greatly elongated, or the relative amount of logotypes would probably be inadequate to the amount of type contained in the machine reservoirs.

From belt I the logotypes are directed by a switch feed L<sup>3</sup> into a chute L which is given a quarter turn and a quarter twist as shown so that the logotype in passing therethrough is not only turned longitudinally and brought over parallel with the type delivered into chute C by belt B, but is also turned laterally upon itself a quarter turn and delivered into the lower end of chute C feet foremost, and nicks facing in the same direction, as the type from reservoirs A. This turning of the logotypes is necessary, because they are delivered on their corners at right angles to the types, and with nicks horizontal and uppermost, whereas the types are delivered upon the carrier nicks vertical and toward the reservoir.

In order to get the setter and race-way as near as possible to the belts, the quarter turn of the logo-type characters is necessary; but I do not confine myself to this turning of the types from the second reservoir, which as above stated it economizes space to lay the logotypes flatwise, yet they could be turned edgewise, and the channel made so that they could not topple over, and by such construction the lateral turning of the logotype would not be necessary. Again if the race-way was lower in relation to the belt I, the logotypes could be delivered flatwise, nicks down, and carried direct over the pulley and dropped feet foremost into the race way as indicated in

Fig. 11. Therefore I do not limit myself to the double turning of the logotypes from the second galley.

The wheels *i*, *b*, are mounted on shafts *i*<sup>4</sup>, *b*<sup>4</sup>, which have intermeshing gears *i*<sup>5</sup>, *b*<sup>5</sup>, on their adjoining ends, whereby both belts are driven by means of power applied to the shaft of wheel *i*.

As shown a small electric motor M is fastened to the stand below reservoir H, and by reducing pulleys and belt drives a counter shaft M', which in turn by reducing pulleys and belt drives the shaft *i*, as shown. The electric current which drives the motor, may also be connected to a lamp *m*, arranged at the corner between the reservoirs, in proper position to enable the machine to be operated when the light is on.

An electric switch is arranged between the motor and electric current supply wires, in convenient reach of the operator, so that he can readily stop and start the machine by manipulating the switch.

*The setter.*—The chute C directs the type into a narrow passage or race-way N, mounted on a support N<sup>4</sup>, which is just wide enough to receive an ordinary type, sidewise, (*i. e.* nicks on the side away from the operator.) In this race-way the type fall in an inclined position, and they are set up on their feet and moved forwardly by a reciprocating setter O which, as shown, is an arc-shaped plunger, mounted on a rock shaft O' journaled just below the race, and rocked continuously while the machine is in motion by means of a spring controlled pitman *o*, one end of which is pivoted to a crank arm *o*<sup>2</sup> on said rock shaft, and the other end is slotted and supported on a center pin *p*, attached to a cam disk *p* secured to the outer end of the shaft of wheel *b*. The pitman carries a friction roller *o*' which runs against the face of the cam, so that the pitman is moved inward, thus rocking shaft O' and drawing the setter backward once during each revolution of the wheel B, or oftener if the cams be multiplied. The pitman is moved forward, and setter O inward, by means of a spring *o*<sup>3</sup> strung on the pitman between a collar O<sup>3</sup> and a bracket O<sup>6</sup> which also serves as a guide for the pitman. The setter moves back and forth rapidly, and when a type drops in front of it it strikes it and moves it to an upright position, the type being kept from falling in the opposite direction by means of a sliding block, or other suitable yielding detent.

The race-way may be made as long as desired, so that one person may operate the machines, and another draw from the race way so much of the composed type as are needed to make up a line for justification; but as shown I have arranged a galley Q, beside the race-way, which is made very short, and the setter will move each type into this galley as it is delivered, until a line of type as long as the galley measure is formed. This line may



then be removed, immediately, from the galley, or by means of a plunger  $Q'$  which is operated by a bell crank lever  $Q^2$  and link  $Q^3$ . The line can be moved down in the galley, and justified therein by the operator, or by an assistant, while the operator continues to set type.

In practice plunger  $Q'$  is normally retracted by a spring,  $Q^4$ , until its inner edge is flush with the face of the race way. A sliding strip  $R$ , just the thickness of the type being set, is then slid across the galley, being suitably guided in a slot in the side thereof opposite the race-way, and then a block  $G^5$  in the galley is slid up against said strip. The machine is then put in operation and the type are delivered in front of the setter  $O$  which pushes them against the end of strip  $R$ , or against a preceding type, and thus gradually fills out the line pushing the strip and type laterally through the galley.

The strip  $R$  is provided with a contact piece  $R'$ , which, when the line is nearly completed contacts with another piece  $R^2$  on the side of the galley, and completes an electrical circuit, in which is a bell  $O^5$ , which rings and notifies the operator to re-adjust the parts for a new line. By using a justifying rule the entire galley may be filled with type before any is removed. The galley and setter are supported on bracket  $N^4$ , so that they are but little below the tops of, and close to the belts. Consequently the travel of the types and logotypes from the reservoirs to the race-way is but short, and moreover the type slide into the race-way laterally, instead of falling vertically into it, and therefore they are not, liable to rebound and thus disarrange the action of the machine, and if a type should strike upon the setter, it will rest thereon until the latter is retracted and then drop into the race-way, and several type may be lying in the chute ready to drop into the race-way without choking the machine.

The setter cam may be driven independently of wheel  $b$ .

The carrier belts may be of metal ribbons, leather or woven fabrics. I propose to use steel ribbons.

The lower case keys, and the channels containing the lower case types, which are most constantly in use, are purposely placed nearest the delivery and galley stick, where they can be most conveniently and rapidly manipulated by the operator.

Where the type are ejected feet foremost the ejectors may have their push ends recessed so that they will only impinge on the shoulders of the type body and not against the faces of the type.

Below the front reservoir, and above the key-board, a case  $S$  may be secured, provided with compartments for small caps, or italics, and for "sorts" or extra types such as indexes, brackets, &c., which are seldom used. This is to shorten up the key-board, and yet

have all the types that might be needed by the compositor at hand.

Below the stand a case drawer  $s$  may be secured, containing head letters, or display type, so that the compositor can set up the heads of articles without leaving the machine.

The extra types, of the proper body, can be set up by the machine, being dropped onto the belts by hand. To facilitate their dropping a funnel chute  $T$  may be secured above belt  $B$ , near chute  $C$ , or to said chute, as indicated in the drawings.

Beside the galley is a small case having a few compartments containing "spaces" so that the lines can be properly adjusted by the operator as they are set up.

*Operation.*—The current being turned on, the carrier belts are rapidly traveled, and the setter reciprocated quickly back and forth. The plungers  $Q'$ , and block  $G^5$  are arranged to form a continuation of the race-way in the galley, and strip  $R$  is slid over toward the setter. The operator then depresses the keys corresponding to the types, punctuation marks, logotypes, &c., necessary to set up the matter to be printed, and each type ejected upon the moving belt is carried forward into the chutes, and thereby directed into the race-way in front of the setter, by which they are pushed into the galley all substantially as described.

I am well aware that in type setting machines, such as those shown in Slingerlad's patents, it has been proposed to employ types bearing two or even more letters, such as the ordinary "en" "in" besides the ordinary font types "ff" "fl," &c., but these are not logotypes in the sense I use the word. They all are formed on bodies not larger than the "em" of the font, and frequently smaller, and can be composed and handled like the ordinary type, and as in my machine the types "ff" "fl" are set up in the ordinary font channels because they do not require any larger size channels. Machines using such logotype I disclaim. My logotypes are much thicker or longer, considering the line of type, than the "em" bodies, and necessitate a different handling; and it is only these extraordinary sized types that I refer to by the word "logotype" used in the claims and description.

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

1. In a combined type and logotype setting machine the combination with distinct sets of holders respectively for font types and three or more letter logotypes, independent ejectors for each holder, and independent carriers for conveying the ejected type and logotype characters to a common assembling race-way, and a device for pushing the type and logotypes therein all constructed substantially as described so that types and logotypes can be independently but correctly brought into position at will to be composed in a line in said



race-way, by said pusher, substantially as described.

2. In a combined type and logotype setting machine, the combination of separate type and logotype holders standing at angles to each other, mechanism for ejecting the type or logotype one at a time, and separate endless belt carriers beside, and running parallel with each holder, for conveying the types into a common race-way, whereby said types and logotypes are automatically brought together in the composed matter, substantially as described.

3. In a combined type and logotype setting machine the combination of a pair of stationary channeled type holders mechanism for ejecting separate type, or logotypes, from the respective holders; mechanism for conveying the ejected type or logotype to a common race-way, a device for partially rotating the logotypes on their way to the race-way, and mechanism for aligning and forwarding them therein, substantially as described.

4. In a combined type and logotype setting machine, the combination of separate receptacles for the type and the logotype characters arranged at angles to each other, and each consisting of a series of parallel diagonal channels, keys and connections whereby upon the depression of a key the corresponding type or logotype is ejected from its channel; a common race-way or composing channel; and separate means for directing the ejected types and logotypes into said channel, substantially as described.

5. In a combined type and logotype setting machine, the combination of separate receptacles for the type and the logotype characters arranged at angles to each other, and each consisting of a series of parallel diagonal channels, keys and connections whereby upon the depression of a key the corresponding type or logotype is ejected from its channel; a common race-way or composing channel; and separate means for directing the ejected types and logotypes into said channel, and means for partially rotating said logotypes on their way to the channel, substantially as described.

6. In a combined type and logotype setting machine, the combination of a pair of stationary receptacles for the type and logotype characters respectively arranged substantially at right angles to each other, keys and connections whereby upon the depression of a key the corresponding type or logotype is ejected from its holder: a type channel or receptacle into which the ejected types or logotypes are moved; a device for pushing the types into said channel; and endless belt carriers driven one from the other for automatically directing the ejected type and logotypes from their receptacle to a common race-way, and in front of a pushing device; and a pusher whereby they are moved into said race-way, substantially as described.

7. In a type setting machine the combina-

tion of two series of type channels standing substantially at right angles to and opening away from each other, a single race-way or assembling channel, at the proximate point of said series, and independent mechanism whereby type from either channel is directed into the said race-way, substantially as described.

8. The combination of two series of type holding channels, arranged at angles to each other, a separate type carrier for each series, moving parallel therewith, a race-way at the junction of said series of channels and mechanism whereby the types are directed from the carriers into said assembling race, substantially as described.

9. The combination of two series of type channels, and an endless belt type carrier for each series; arranged at angles to each other, a single assembling race-way at the proximate point of said belts, and mechanism for diverting the type from both belts into the said race-way, and a single "pusher" for moving type into said race-way, substantially as described.

10. In a type setting machine the combination of two series of diagonal parallel type channels arranged at angles to each other, a carrier belt for each series, said belts running at angles to each other and toward a common race-way; and chutes and switches for directing the type from each belt into said race-way, and a device for pushing the types through the race-way, substantially as described.

11. The combination of two series of type holding channels, and an independent carrier for each series, a common race-way, and means for directing the types from said carriers into said race-way, and means for partially rotating the type from one series of channels, substantially as described.

12. In a combined type and logotype setting machine, the combination of receptacles for each type and logotype character arranged at angles to each other, mechanism for ejecting the separate type and logotypes at the will of the operator from their respective holders; and independent type carriers moving toward, but lying at angles to, each other for conveying the ejected type or logotype to a common race-way at the meeting point of the carriers, substantially as specified.

13. In a combined type and logotype setting machine, the combination of a receptacle for each type or logotype character, mechanism for ejecting the separate type or logotypes at the will of the operator from their respective holders; and mechanism for conveying the ejected type or logotype to a common race-way, and means for turning the logotype so that it will align with the type, substantially as described.

14. A type reservoir having a series of parallel type channels, and formed of top and bottom diagonally grooved bars, and vertical strips  $a^2$ , secured in the grooves of said bars,



having thin longitudinal portions  $\alpha^3$  at rear, and tapered at one end as at  $\alpha^4$ , substantially as described.

15. The combination of two type reservoirs 5 arranged at angles to each other, and an endless belt carrier for each reservoir, means for driving one of said belts from the other, and mechanism for ejecting type from said reservoir directly upon its belt, and a common receiver into which the types from either belt 10 are directed, substantially as described.

16. The combination in a type setting machine, of type reservoirs, a single assembling race-way, means for conducting type thereto 15 from the reservoirs, and means for rotating the type from one reservoir, substantially as described, prior to its assembling in the race-way, substantially as specified.

17. The combination of two type reservoirs, 20 a single race-way, means for conducting type from both reservoirs to said race-way, and means for partially rotating the type from one reservoir prior to its entering the race-way, and means for pushing the type success- 25 ively into said race-way, substantially as described.

18. In a type setting machine, the combination of two series of type channels standing at substantially right angles to each other 30 and both opening outwardly, means for ejecting type from any channel in either series; an endless belt carrier running beside each series, and at an angle to the other belt, a single race-way, means for directing types from 35 either belt into the common race-way; a vibrating setter for pushing type into said race-way, the gearing between the belt driving wheels, and the devices for operating said setter from one of the belt wheels, all constructed and arranged to operate substan- 40 tially as and for the purpose set forth.

19. In a combined type and logotype setting machine, the combination of an ordinary type reservoir for holding type with their 45 nicks vertical and a word logotype reservoir for holding the logotype with nicks horizontal and uppermost; with devices for ejecting separate types or logotypes at will, and separate movable carriers for respectively conveying the types and logotypes when ejected 50

to a common race-way or composing channel, and a common setter for aligning them in said race-way, substantially as described.

20. In a combined type and logotype setting machine, the combination of a pair of 55 stationary receptacles for type and logotype characters respectively, arranged substantially at right angles to each other, keys and connections whereby upon the depression of a key the corresponding type or logotype is 60 ejected from its holder; a common type channel or race-way into which the ejected types or logotypes are delivered; and an endless belt carrier beside the lower end of each receptacle for conveying the ejected types and 65 logotypes separately to said race-way, and means whereby the types are successively moved into said race-way, substantially as described.

21. The combination of a series of type channels; an endless belt extending parallel with the series, and close to the lower ends thereof, keys and connections for ejecting the type upon the belt at will of the operator, a race-way, into which the types are delivered, and 75 a vibrating spring controlled pusher for moving the types into said race-way, a pitman for vibrating said pusher, operated in one direction by a cam on one of the belt driving wheels and in the opposite direction by a spring, all 80 constructed and arranged substantially as described.

22. The combination of the type holding and delivering mechanisms, and race-way, of the vibrating pusher or setter O mounted on 85 a rock shaft, O', a pitman rod o for rocking said shaft, a spring  $o^3$  on said rod adapted to cause it to force said setter yieldingly in one direction, to set the type, and a rotating cam P engaging said rod to move it in the opposite direction and draw the setter outward 90 against the action of the spring, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two 95 witnesses.

PAUL F. COX.

Witnesses:

A. L. FOGG,  
E. D. AUSTIN.