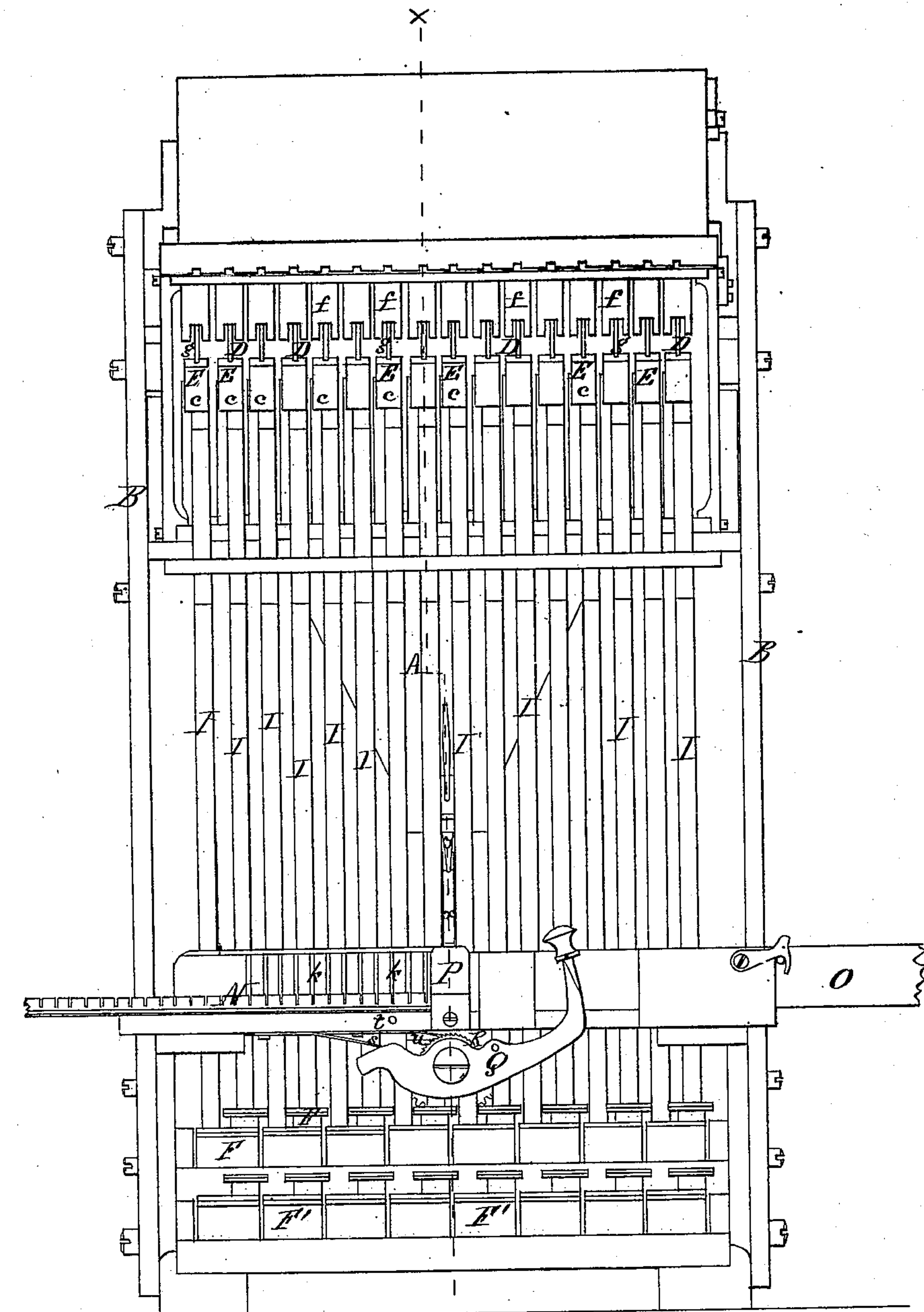


M. DE LA PEÑA.
TYPE SETTING MACHINE.

No. 108,980.

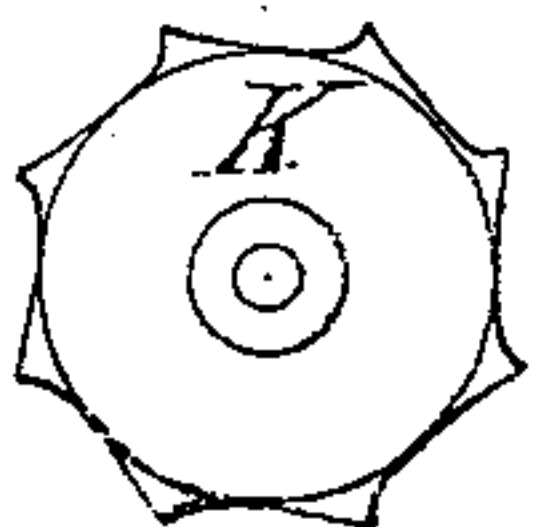
Patented Nov. 8, 1870.

Fig. 1.
(Front Elevation.)



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Fig. 1^a



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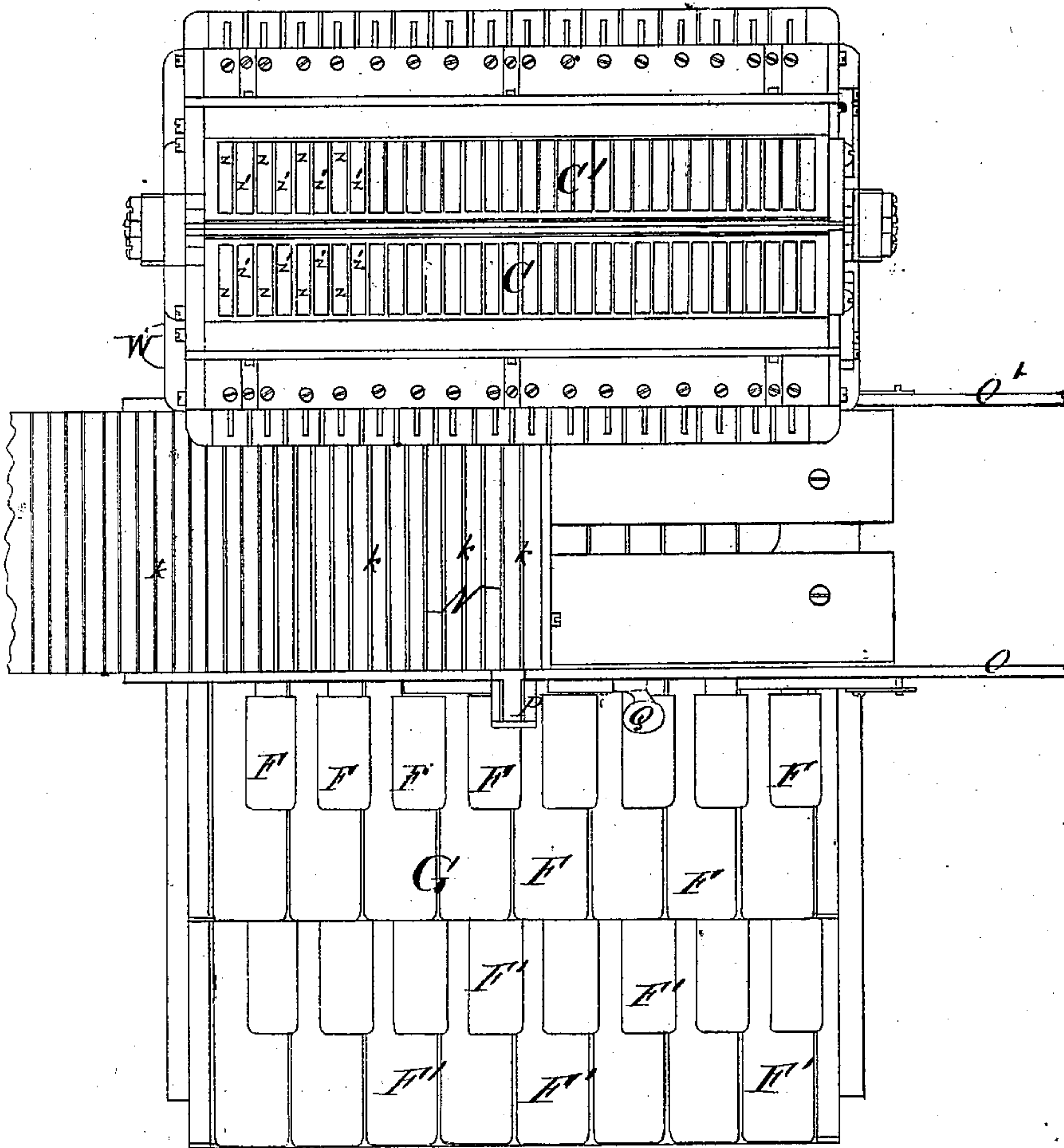
M. DE LA PEÑA.
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Fig. 2.

(Plan.)



Witnesses.
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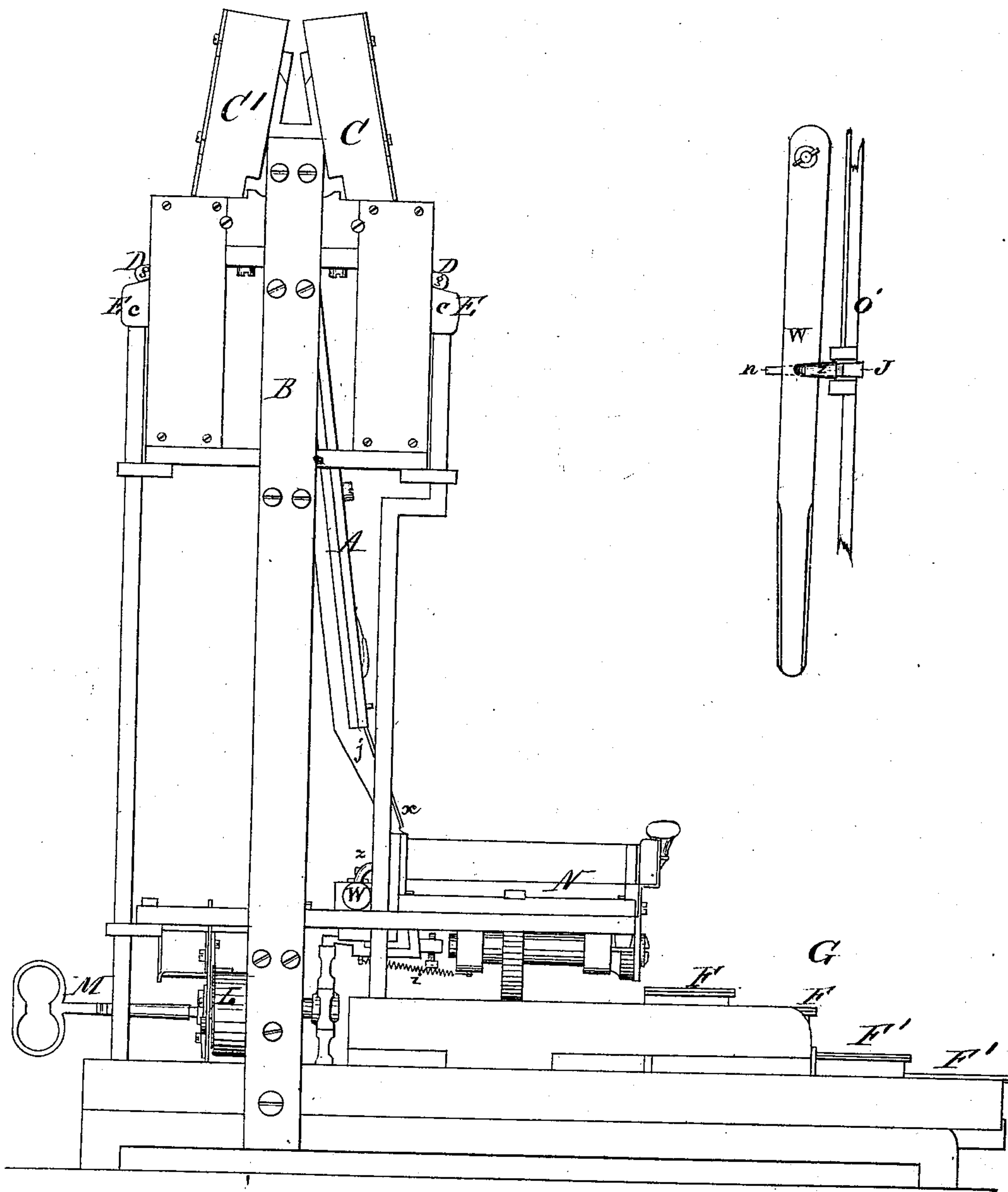
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Fig. 3.
(Side Elevation)



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Fig. 4.
Trans. Vert. Sect.
on x.x. of Fig 1.

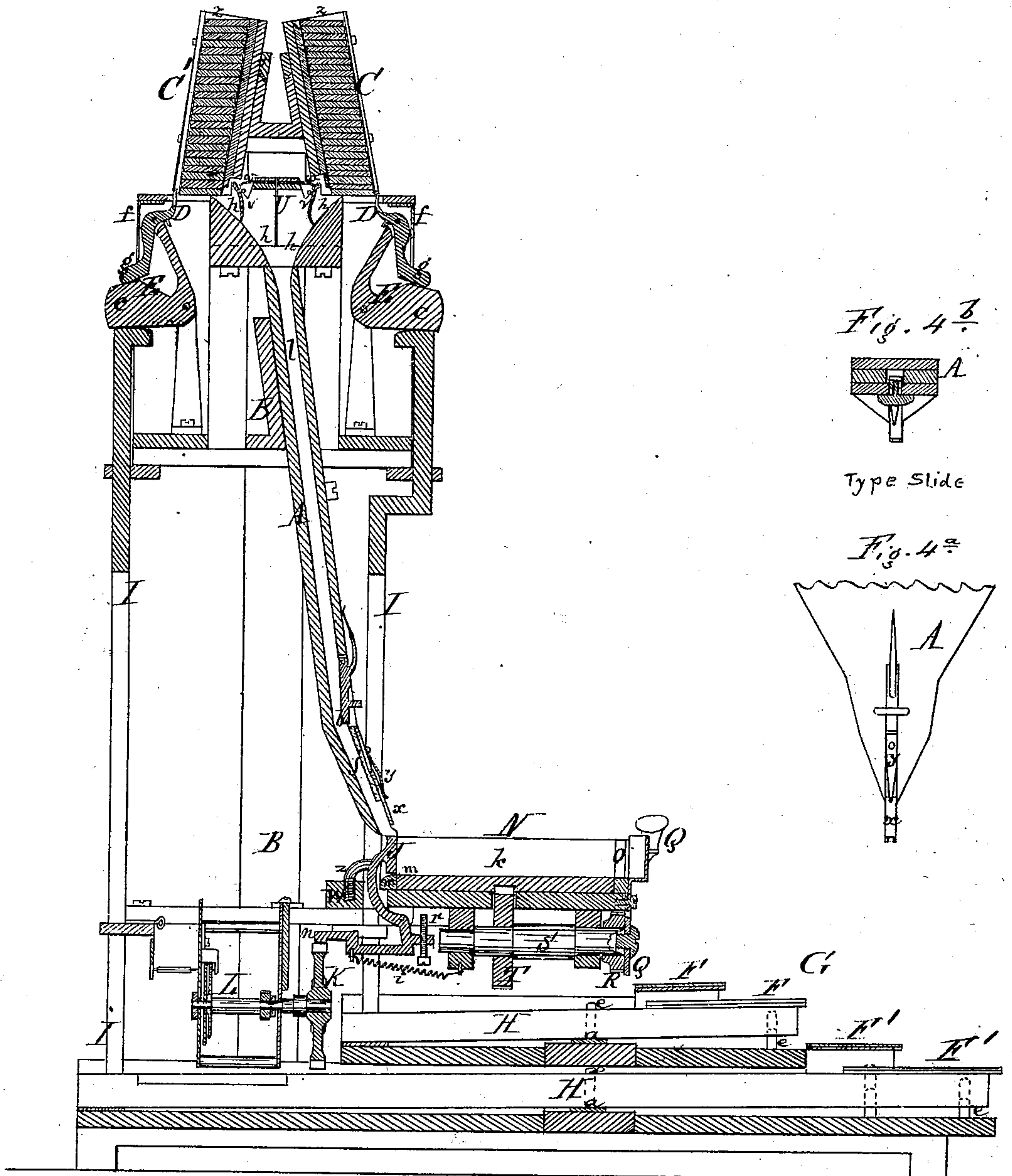


Fig. 4 b.

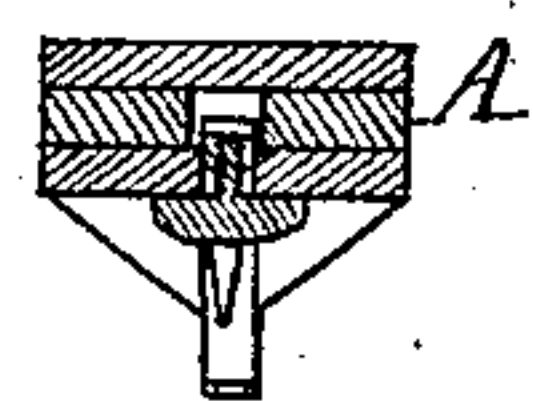
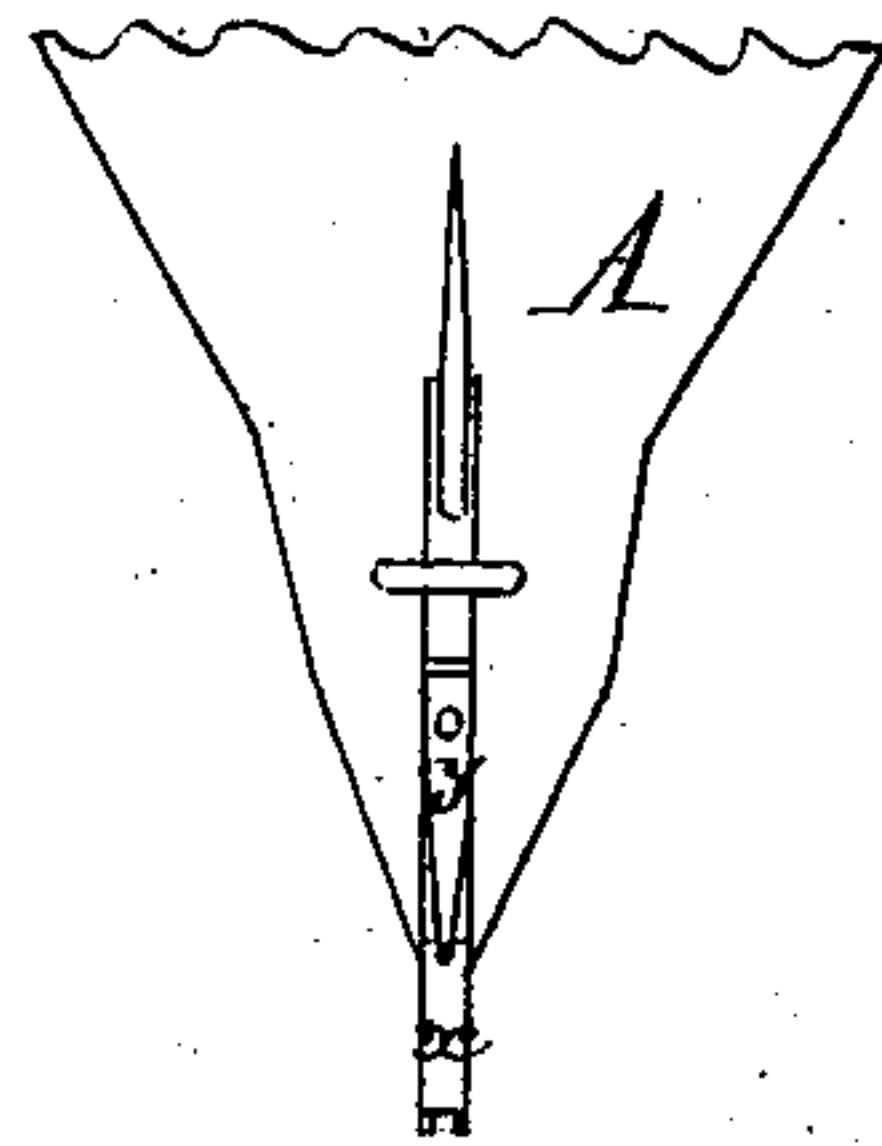


Fig. 4^a.



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Fig. 6. Enlarged

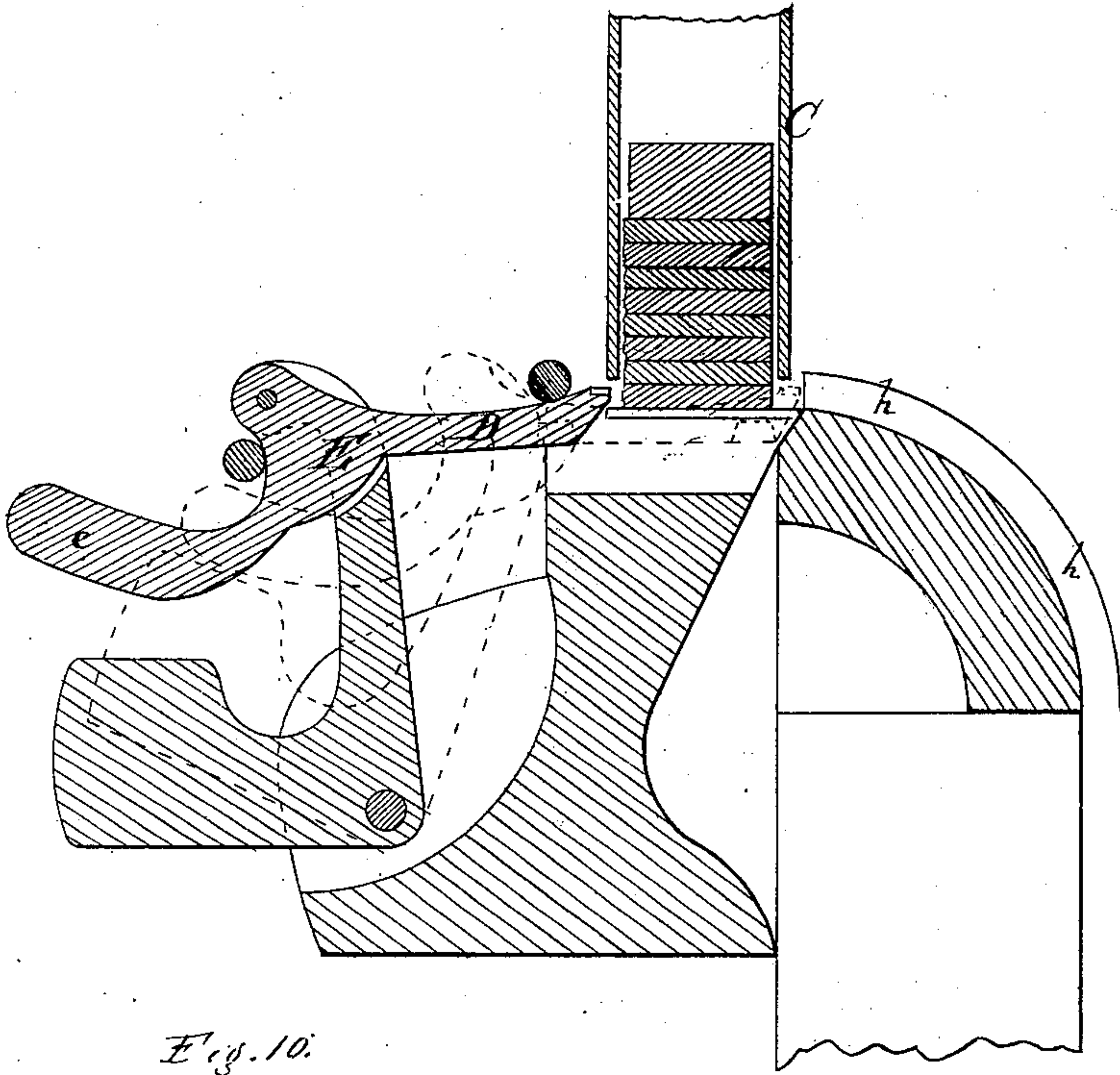


Fig. 10.

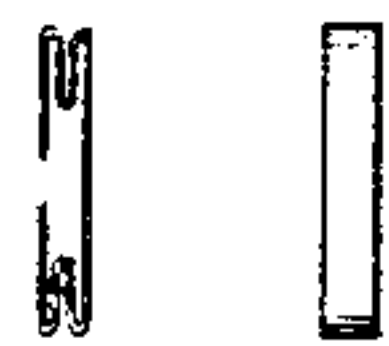
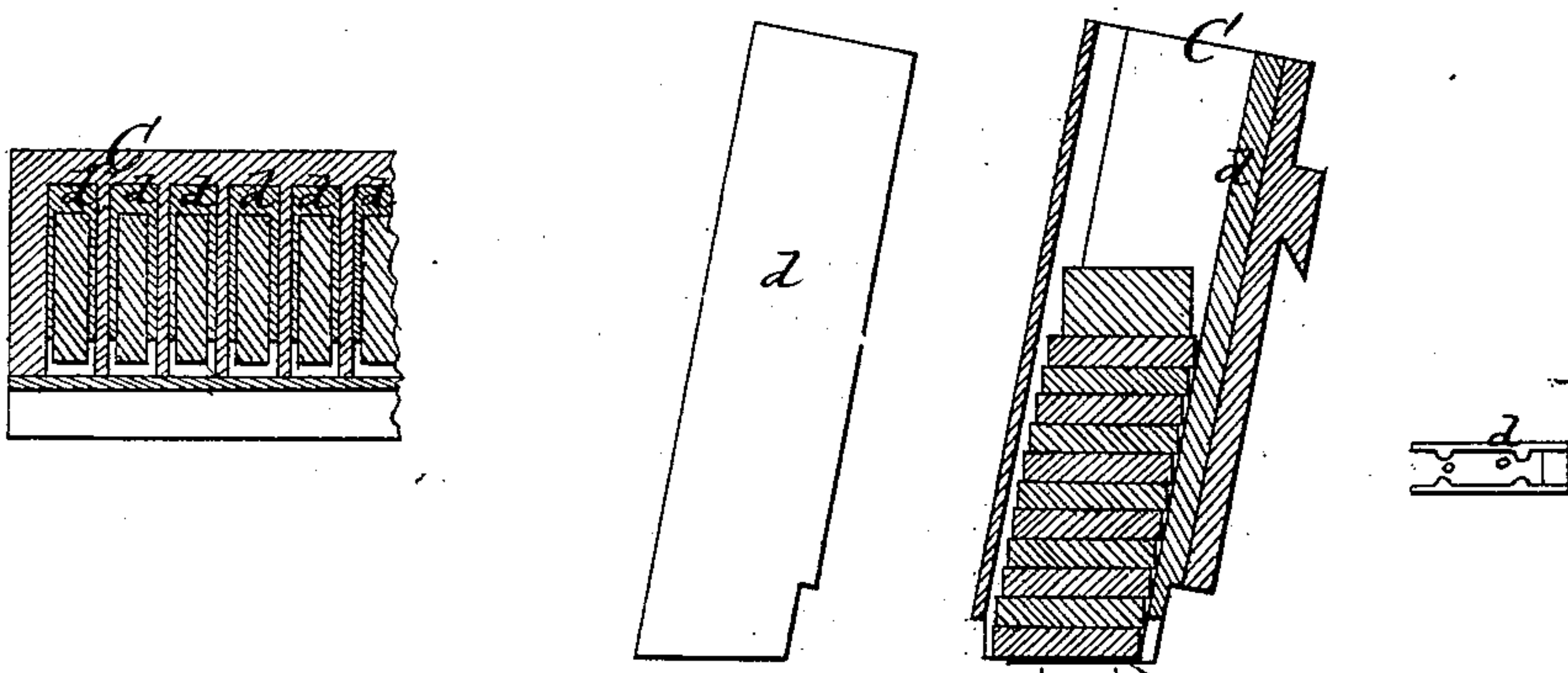


Fig. 5
(Type Holder, -Enlarged.)



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TYPE SETTING MACHINE.

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Fig. 7.

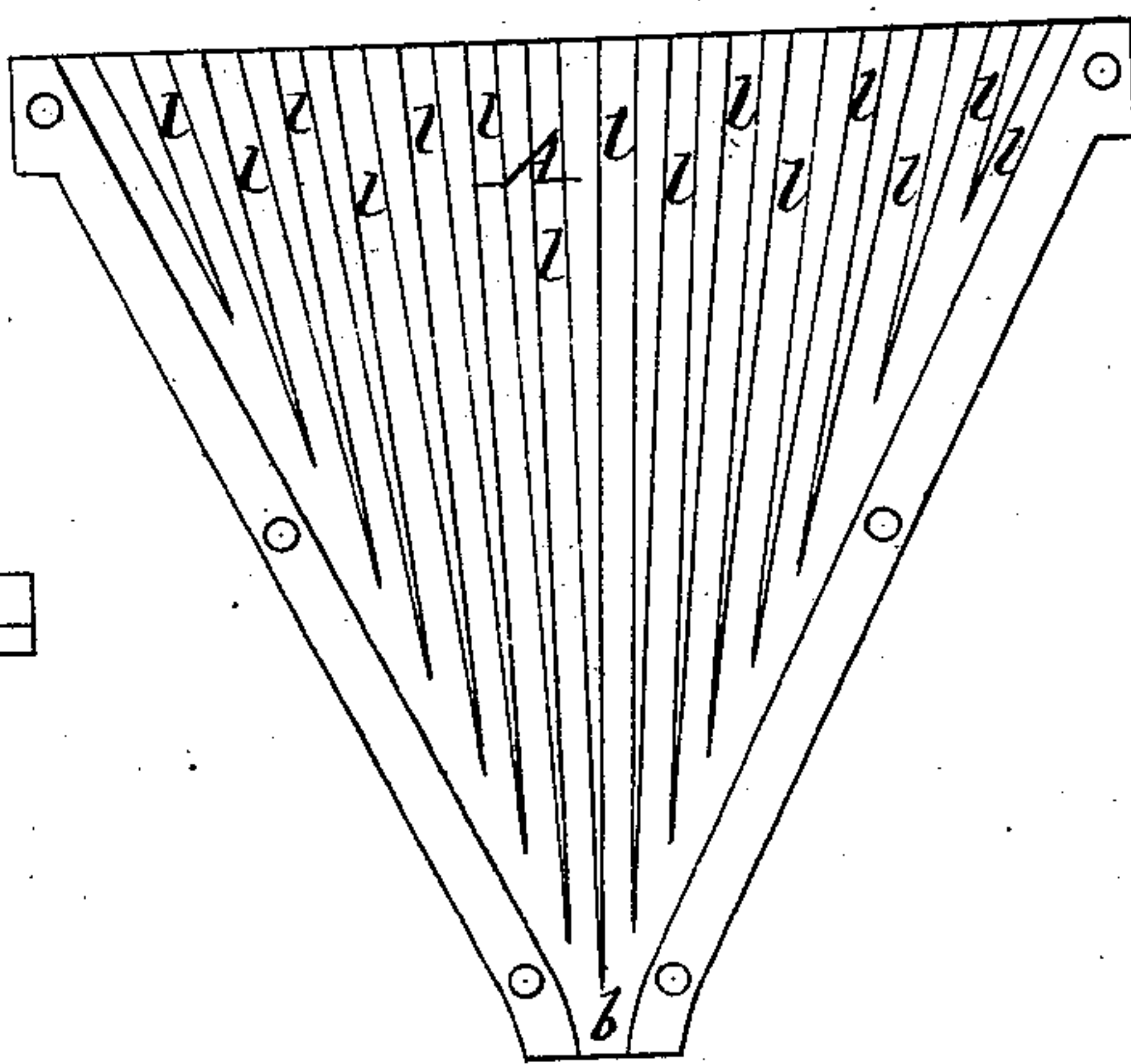
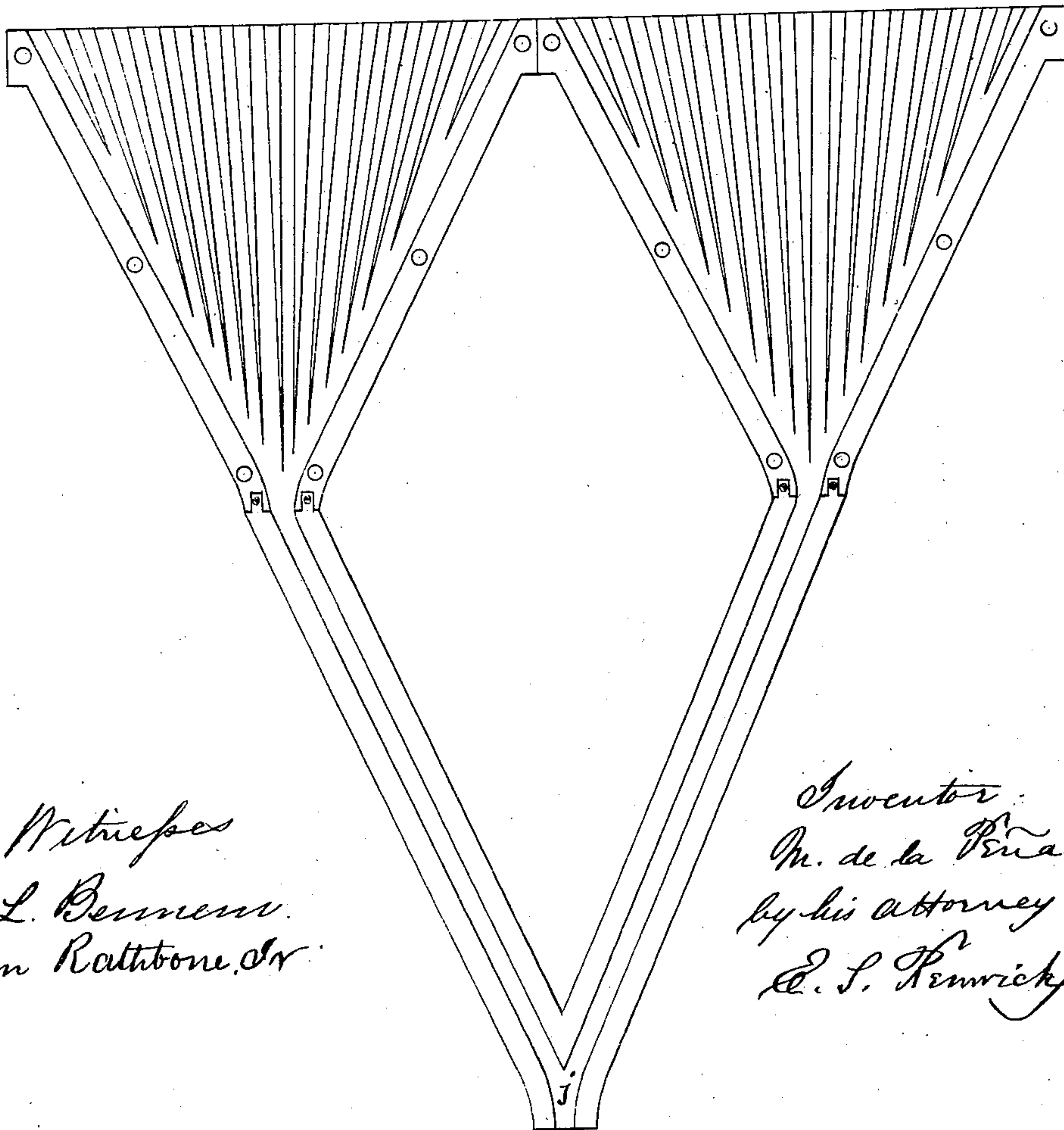


Fig. 8.



Fig. 9.



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United States Patent Office.

MANOEL DE LA PENA, OF NEW YORK, N. Y., ASSIGNOR TO J. G. O. GUIMARAES, OF SAME PLACE.

Letters Patent No. 108,980, dated November 8, 1870.

IMPROVEMENT IN TYPE-SETTING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, MANOEL DE LA PEÑA, a citizen of the Argentine Republic, of South America, now residing in the city, county, and State of New York, have made an invention of certain new and useful Improvements in Machines for Setting Types; and that the following is a full, clear, and exact description and specification of the same.

The object of this invention is to cause types to be selected and set in line by operating upon a keyboard having as many keys as there are kinds of type-characters in the instrument. To this end,

The invention consists of a branching gravitation type-slide, and of certain combinations of it, and sundry other instrumentalities for the purpose of setting the types in line.

The branching gravitation type-slide is an upright apparatus, fitted with a delivery aperture at its lower end, and with a series of inclosed passages diverging in an upward direction from that aperture, so as to receive types at a number of points along its upper end or head, to permit them to pass down through it by gravitation, and to guide them all to its delivery aperture.

As the type-passages in this type-slide are inclosed on all sides, the type in every passage is prevented from turning on its longitudinal axis, and from escaping from the passage until it arrives at the delivery aperture of the apparatus, even though the apparatus be set in a vertical position, or thereabout; and as a consequence of this peculiarity, the same type-slide may be used in combination with two sets of type-holders, one set or series at each side of its upper end or head.

The other principal instruments which are employed in producing the new combinations are the following, viz:

A series of two or more type-holders, to hold the types in columns at the head of the branching gravitation type-slide.

A series of two or more reciprocating type-ejectors, one for each type-holder, for the purpose of ejecting the lowest type in each.

A series of two or more keys, forming a key-board, the function of each of said keys being to operate a corresponding type-ejector.

A type-carriage, to receive the types as they are delivered from the branching gravitation type-slide.

A reciprocating type-setter, to move the types forward upon the carriage as they are delivered from the branching gravitation type-slide.

In order that the invention may be fully understood, a machine embodying it has been represented

in the accompanying drawing, and the following is a description of the same.

The combinations claimed as new are recited at the close of the description.

In the drawing—

Figure 1 represents a front elevation of the machine of half the working dimensions;

Figure 2 represents a plan of the same;

Figure 3 represents a side elevation of the same;

Figure 4 represents a transverse section of the same, at the line *x x* of fig. 1;

Figures 4^a and 4^b represent views of portions of the type-slide and its appurtenances;

Figure 5 represent views of a type-holder of the working dimensions;

Figure 6 represents a transverse section of certain parts of the machine, of the working side, and of modified form;

Figures 7 and 8 represent views of the branching gravitation type-slide of half the working dimensions; and

Figure 9 represents a view of a modification of the same.

The branching gravitation type-slide A, as represented in the said figures, is, by preference, constructed of triangular form, with the point downward. Its interior, as seen at fig. 7, is divided into a series of type-passages, *l l l l l*, each of sufficient size, transversely, to permit a type to slide freely down it, and all discharging into a common delivery aperture, *b*, from which all the types are discharged.

As this type-slide has both a front and a back, as represented in section in fig. 4, as well as partitions, between the passages, each passage is inclosed at all sides, so that the types cannot turn upon their longitudinal axes, or escape from the passages until they reach the delivery aperture, even though the type-slide be set in a vertical position.

This type-slide is supported in an erect position in the machine, by means of the frame B thereof, and is, by preference, combined with two series of type-holders C C', which are arranged at opposite sides of its head.

Each of these series has as many cavities, *z*, for type, as there are branching passages in the type-slide; and each of these cavities is, by preference, constructed with a removable lining, *d*, fig. 5, having small lips, *o*, at its lower end, to prevent the types from dropping out. This lining can be removed from the series when exhausted of types, and may be readily refilled, or may be replaced by a duplicate lining which has been previously filled with types.

The type-holders receive the types in horizontal

positions, as represented in figs. 4 and 5, and with their butts inward. The types are ejected one at a time from the bottom of each holder, through an aperture made for the purpose at the bottom of the inner side thereof, or that nearest the type-slide A.

In order that the types may keep close to the inner sides of the type-holders the latter are inclined, as seen in figs. 3 and 4, so that the inner ends of the types, during their descent, slide against the said inner sides.

The types are ejected from the type-holders by means of type-ejectors, one, D, of which is provided for each type-cavity.

Each ejector is pivoted to a bent lever, E, whose lower end, *c*, is weighted, so as to draw the type-ejector D outward, after it has been moved inward, for the purpose of ejecting a type.

The ejecting movement is imparted by means of one of the keys F F' of the key-board G, the said key-board being constructed with a key for each type-cavity of the type-holder.

The keys are divided into two sets; one, F, for the front series of type-holders C, and one, F', for the rear series, C'.

The key of each set is connected with the front end of a lever, H, which rocks upon a fulcrum, *a*, and is guided in its movement by pins *e e*, in manner similar to the key-levers of piano-fortes.

The rear end of each key-lever is arranged to operate upon the under side of the ejector-lever E, of its appropriate type-ejector, through the intervention of an upright rod, I, which is constructed to slide loosely in guides connected with the frame of the machine.

From this arrangement it results that when any particular key of the key-board is pressed by the finger of an operator, the type-ejector corresponding with that key is pushed inward and impelled against the lowest type of the type-holder in front of that type-ejector; and this type is pushed inward and ejected from the type-holder; while, when the pressure upon the key is removed, the key is restored to its position by the weight of the rod I, and the type-ejector is drawn outward by the weight of the outer end *c* of the weighted ejector-lever E.

When a type is ejected the column of types above it tends to descend by gravitation and to depress the type-ejector. Such depression is permitted as soon as the pressure is removed from the key, by reason of the connection of the type-ejector with its ejector-lever by means of a pivot, as seen in fig. 4; but the type-ejector is prevented from descending during its inward or ejecting movement by the bearing of its shank *g* upon the adjacent end of the ejector-lever E, and the acting end of the ejector is compelled to rise upon its return to its outward position by the action of a guard, *f*, against which its shank strikes when it is moved to its outermost position by the action of the ejector-lever.

The type, when ejected, passes down a curved passage, *h*, fig. 4, which directs it to the head of the type-slide A; thence it enters the corresponding channel of the type-slide, and gliding down it by gravitation, is conducted to the delivery-aperture *b* thereof.

The delivery-aperture is succeeded by a passage, *j*, down which the type glides until it is stopped by the striking of its butt against the type-rest *m*, fig. 4, upon which it stands erect. The front of this passage is open for the height of the type, so that the latter can be pushed out of it upon the type-carriage.

The back of the lower part of this passage is formed by the front of the type-setter J, which is constructed to reciprocate in the passage for the purpose of pushing the type out of the same upon the type-carriage, and for moving forward the row of types on the car-

riage so as to make room for the reception of each additional type delivered from the type-slide.

The type-setter is pivoted near its middle to the frame of the machine, and its shank *n* projects backward horizontally over a cam-wheel, K, (represented at fig. 1,) which is caused to revolve by mechanism L, driven by a spring, so as to move the type-setter outward.

After each outward movement, the type-setter is drawn inward by the action of a spring, *i*, and the distance to which it is permitted to move inward is regulated by a set-screw, *r*.

The spring mechanism for moving the type-setter resembles that of a clock, and the spring may either be wound up by a key, M, as represented in the drawing, or by means of a treadle, which is connected with the spring-arbor by a rack and ratchet-pinion, and is operated by the foot of the operator.

The type-carriage N is constructed to slide upon ways crosswise to the plane of motion of the type-setter J, and is fitted with a series of partitions, *k*, which form a series of parallel type-cavities, each of which is of a suitable width to receive a row of types.

The sides of this carriage pass between bars O O', which retain the lines of types in the cavities; and at the side of the frame, opposite the type-setter J, there is arranged a quadrat-holder, P, to receive a large quadrat or blank, which is placed in the cavity in advance of the line of types, to prevent them from falling down when moved by the type-setter. This quadrat is pushed across the carriage by the progressive accumulation of types, and is finally received in the quadrat-holder P, whence it is removed before a succeeding line of types is set up.

The type-carriage is caused to move along its ways by the action of a lever, Q, to which the hand of the operator is applied when each line of types is completed.

This lever is provided with a spring pawl, which operates upon a ratchet-wheel, R, secured to a shaft, S, beneath the type-carriage; and the shaft S is fitted with a cog-wheel, T, whose teeth engage in those of a rack, secured to the under side of the carriage; hence the depression of the lever causes the turning of the shaft S and its cog-wheel and the movement of the carriage, while a spring, *s*, is provided to restore the lever to its position whenever the pressure is removed, the pawl then gliding over the inclined sides of the ratchet-teeth.

The distance to which the lever can be moved is determined by a stop, *t*, and is just sufficient to cause the movement of the carriage the distance from one type-cavity to the next succeeding one.

A spring pawl, *u*, is provided to prevent the backward movement of the ratchet-wheel by the return of the lever Q to its normal position.

The passage *h*, leading from the type-holder to the head of the type-slide, in the machine represented in figs. 1 to 4, inclusive, descends abruptly from the type-holder in consequence of the arrangement of the type-holder close to the head of the type-slide; hence the type, when ejected from the type-holder, might fall, if left to itself, to descend butt foremost into the type-slide.

To prevent such an occurrence a gate, *v*, is suspended from a pivot into the passage *h*, and a slight spring, *w*, is applied to the back of the gate to press it downward; hence, when a type is ejected its end bears against the gate, which yields to the pressure and permits the type to pass out of the type-holder; but as soon as the type is out of the type-holder, the pressure of the gate upon it compels its front end or butt to turn down and enter the channel of the type-slide.

If the type holders are arranged at a greater dis-

tance from the head of the type-slide, as represented at fig. 6, so that the passage *h* may be less abrupt than it is in the machine represented at fig. 4, the spring gate represented in that figure is not required.

In order that the type when in the passage may not extend across into the passage leading from the type-holder at the opposite side of the head of the type-slide *A*, a partition, *U*, is inserted between the two passages.

As the type-setter *J* reciprocates at regular intervals, determined by the mechanism that operates it, while the descent of the types is controlled by other means, it might happen that a type might not descend entirely to the type-rest *m* before the type-setter should act upon it. In this case the upper end of the type would be above the end of the aperture provided for its escape. In order to permit the type to escape under such circumstances, the front side of the type-passage *j* is formed in part by a gate, *z*, which is hinged to the walls of the passage by a pivot, and is held in its place by a spring, *y*. Hence, in case a type is acted upon under the circumstances above stated, this gate yields to the pressure and permits the type to escape; after the escape of the type, the force of the spring returns the gate to its normal position.

The last type set in a line may be of such size as to cause the line to project beyond the inner side of the type-carriage when the type-setter withdraws from it; in which case the projecting portion of the type would impede or prevent the movement of the type-carriage by striking the end of the bar *O*.

In order to prevent such projection during the movement of the carriage, the machine is fitted with a justifier, *z*, which is connected with a lever, *W*. The lever *W* is pivoted at one end of the machine, and its opposite end projects in a convenient position, as shown at fig. 1, to be manipulated by the hand of the operator. The justifier *z* is attached to the middle of this lever, immediately behind the type-setter *J*, so that the latter can be moved forward by the justifier. When the carriage is to be moved, the attendant operates the lever *W* with one hand, so as to hold the type-setter in its most forward position, and thereby prevent the projection of the line of type beyond the inner side of the carriage during its movement.

The horizontal breadth of the ejector-levers *E* and upright rods *I* is greater than the breadths of types of the smaller sizes commonly used, so that the type-cavities *z z*, when small types are to be used, cannot be arranged close to each other.

The series of type-holders *O* and *O'* have therefore been constructed with the type-cavities *z z* separated by an intermediate set of type-cavities, *z' z'*, which intervene between the first set *z*; and the series of type-holders has been arranged to slide endwise upon the frame of the machine, so that either set of type-cavities, *z* or *z'*, may be placed in position to operate with the type-ejectors *D*.

This construction permits two fonts of types to be set by the same set of keys, the types of one font being contained in one set of cavities *z*, and those of the other font in the set of cavities *z'*; and the operator can set types from either font by first moving the type-holders so that the cavities holding the required font correspond with the type-ejectors.

The type-setting machine thus described permits the types to be set with great rapidity and ease into parallel lines corresponding with the parallel cavities of the type-carriage, as every movement of the finger upon a key effects the setting of a type.

In order to justify the lines, a spring justifying-

quadrat, such as is represented at fig. 10, is employed. This yields to the pressure of the type-setter, and compels the types to fill up the whole breadth of the line. One or more such spring quadrats may be used in each line, in the same manner as an ordinary quadrat.

The branching gravitation type-slide may be extended in size so as to operate in connection with a larger number of type-holders than are contained in the machine represented at figs. 1 to 4. Or, two or more such slides may be placed side by side, as represented at fig. 9, and arranged to discharge their types into a passage, *j*, which is common to all; or, two such slides may be arranged back to back in like manner.

Having thus described a machine embodying my invention, I deem it proper to say that the machine may be greatly modified without changing the principle.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of the inclosed branching gravitation type-slide with two series of type-holders arranged at opposite sides of the head of said slide, the whole being constructed to operate, in combination substantially as before set forth, so that the types from opposite type-holders can be delivered into one passage of said slide.

2. The combination of the inclosed branching gravitation type-slide, the series of type-holders arranged at one side of the head thereof, and the type-ejectors arranged to move in the direction of the lengths of the types in said type-holders, all constructed to operate in combination substantially as before set forth so that the types are ejected endwise from the type-holders and received by the gravitation type-passages.

3. The combination of a type-ejector with the ejector-lever in such manner that the former is maintained erect during its forward movement, and permitted to descend during its retrograde movement, substantially as before set forth.

4. The combination of the type-ejector, the ejector-lever, and the guard which compels the rise of the ejector at the end of its retrograde movement, substantially as before set forth.

5. The combination of the inclosed branching gravitation type-slide, the series of type-holders, the series of type-ejectors arranged to move in the direction of the length of the types in said holders, and the series of keys for operating the type-ejectors, all constructed to operate in combination substantially as before set forth.

6. The type-carriage, constructed with a series of transverse partitions forming parallel cavities for the reception of the types, substantially as before set forth.

7. The combination of the type-holder with a removable lining for holding the types, substantially as before set forth.

8. The combination of the type-setter and type-carriage with the justifier, substantially as before set forth.

9. The combination of a set of type-ejectors with a movable series of type-holders containing a double set of type-cavities, substantially as before set forth.

In testimony whereof, I have hereto set my hand this 4th day of October, A. D. 1869.

ML. DE LA PEÑA.

Witnesses:

E. S. RENWICK,
W. L. BENNEM.