

A. COREY.
Type-Setting Machines.

2 Sheets--Sheet 1.

No. 130,485.

Patented Aug. 13, 1872.

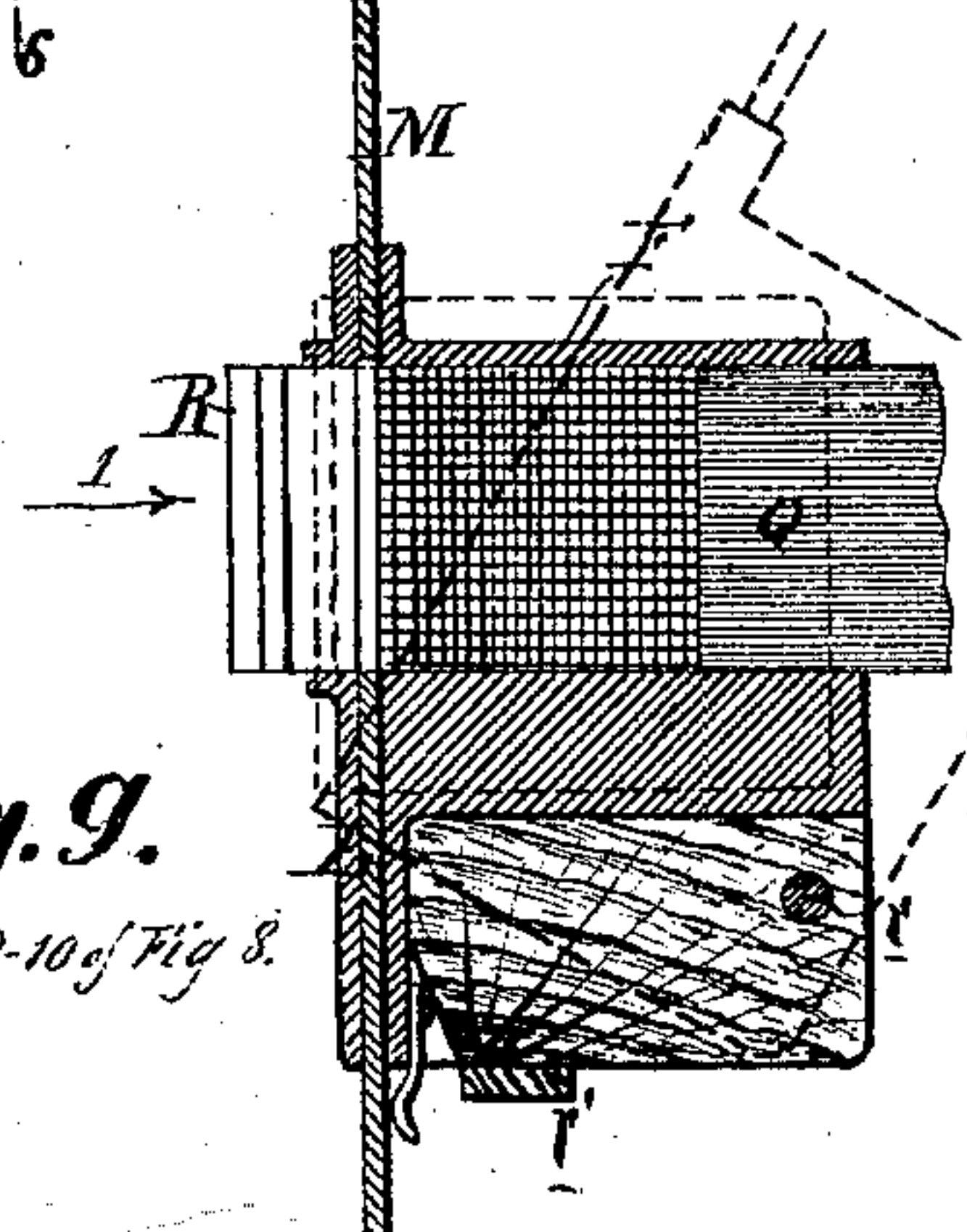
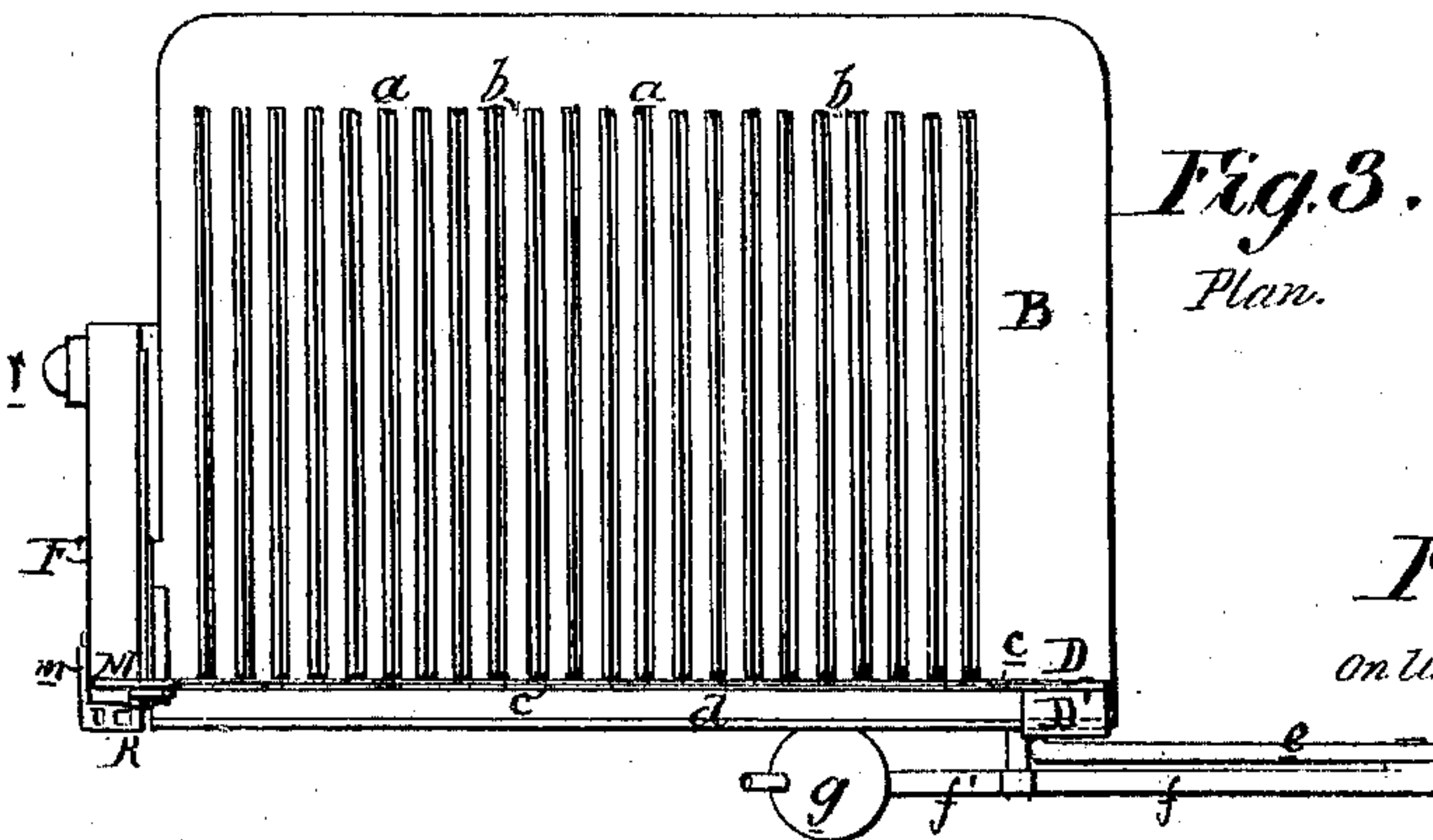
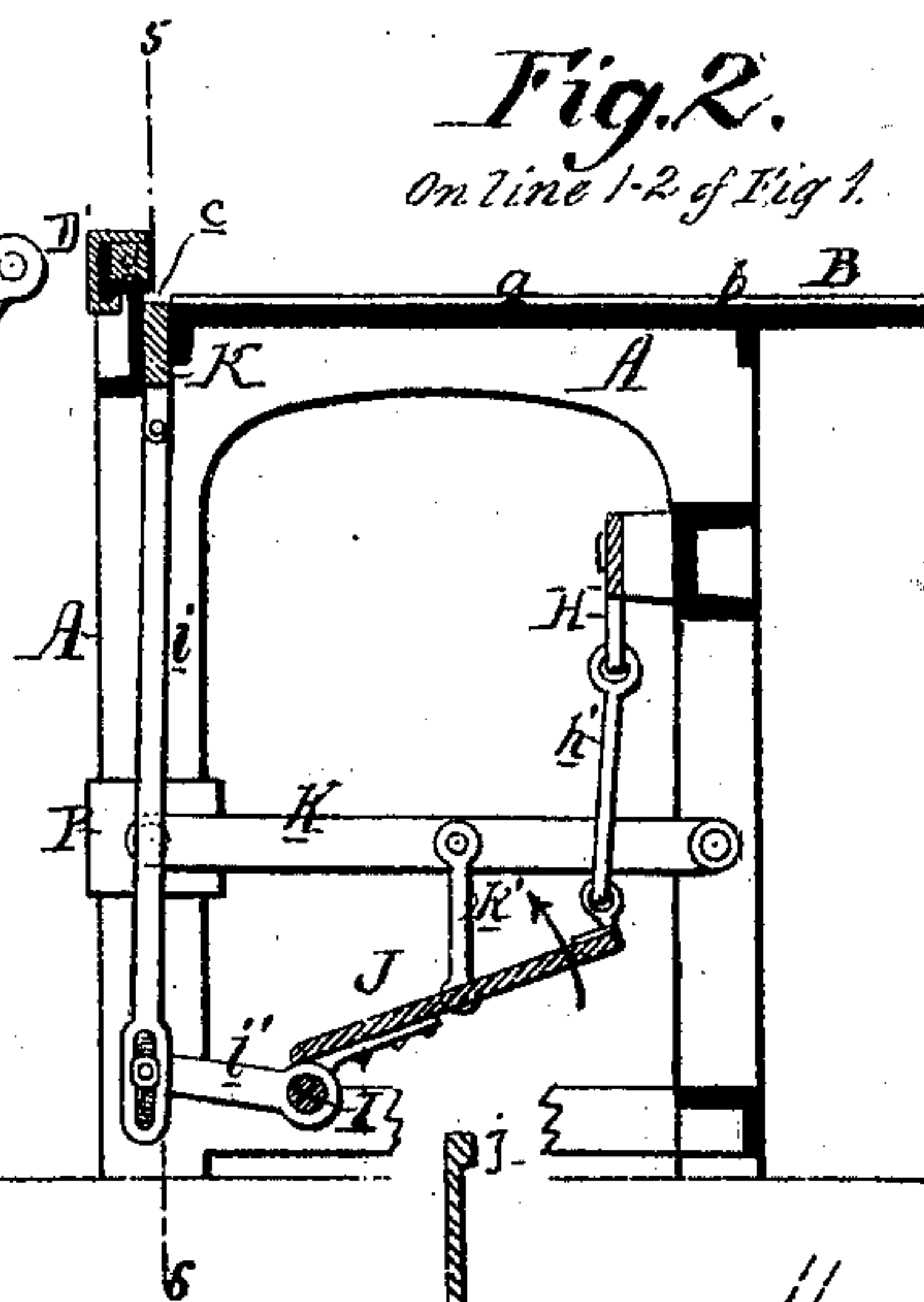
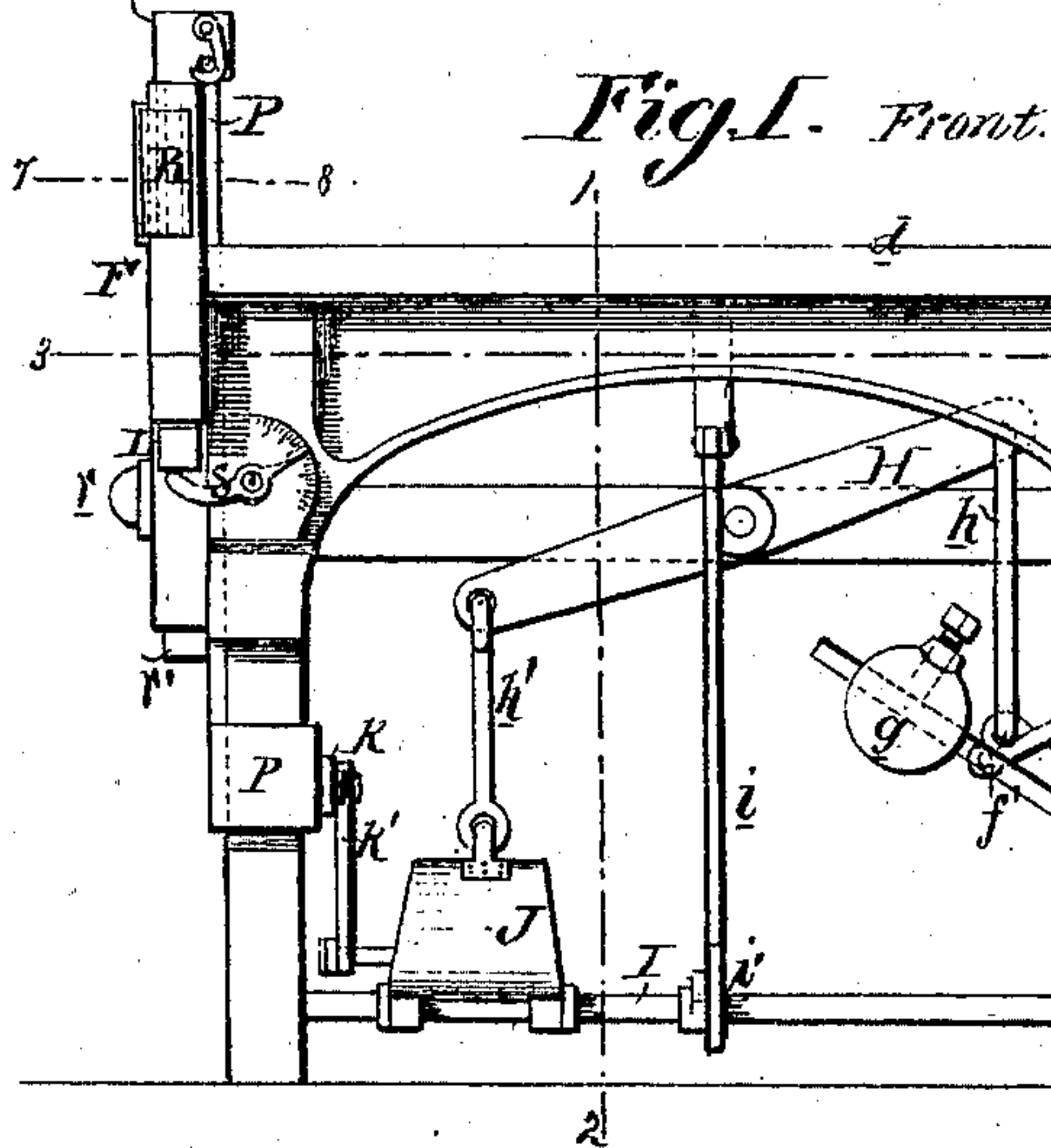


Fig. 4.
On line 3-4 of Fig. 1

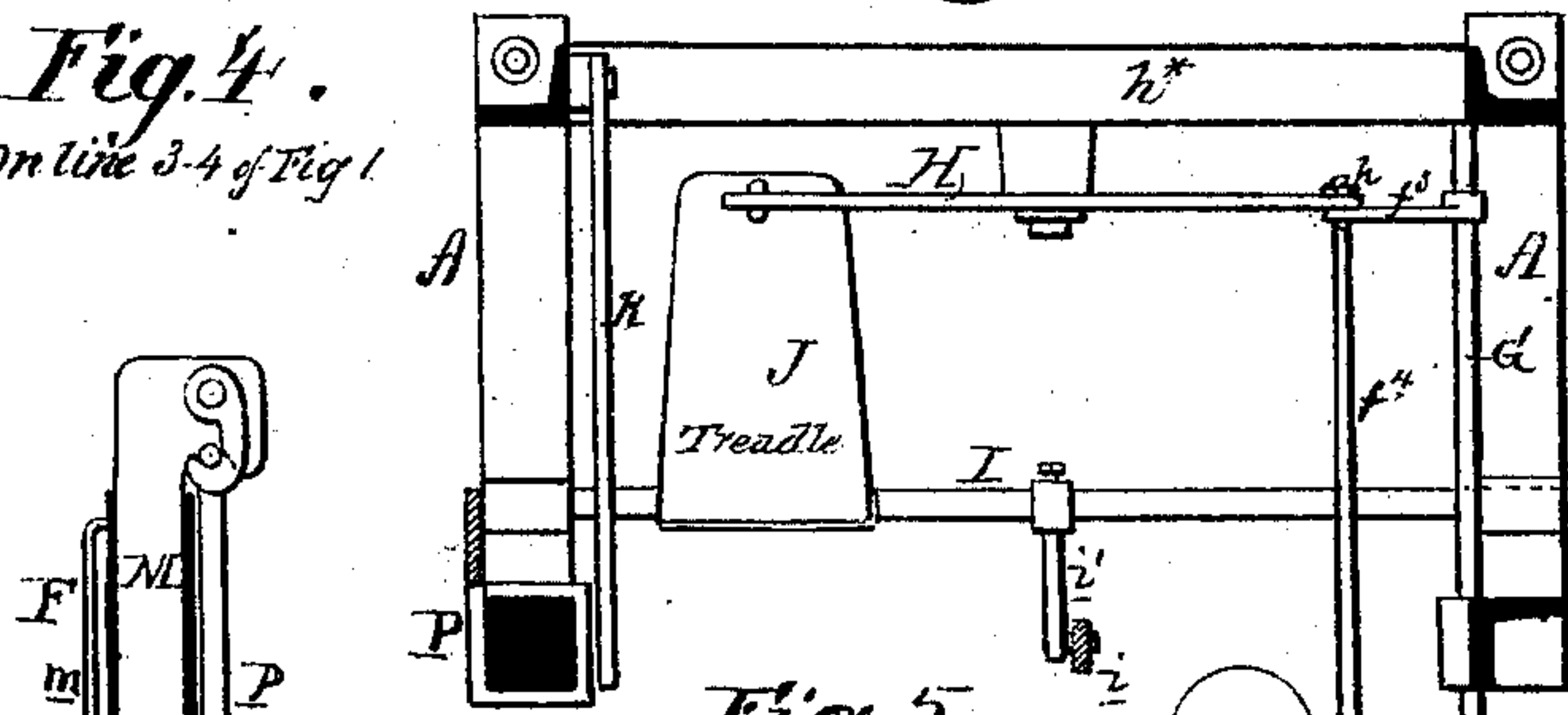
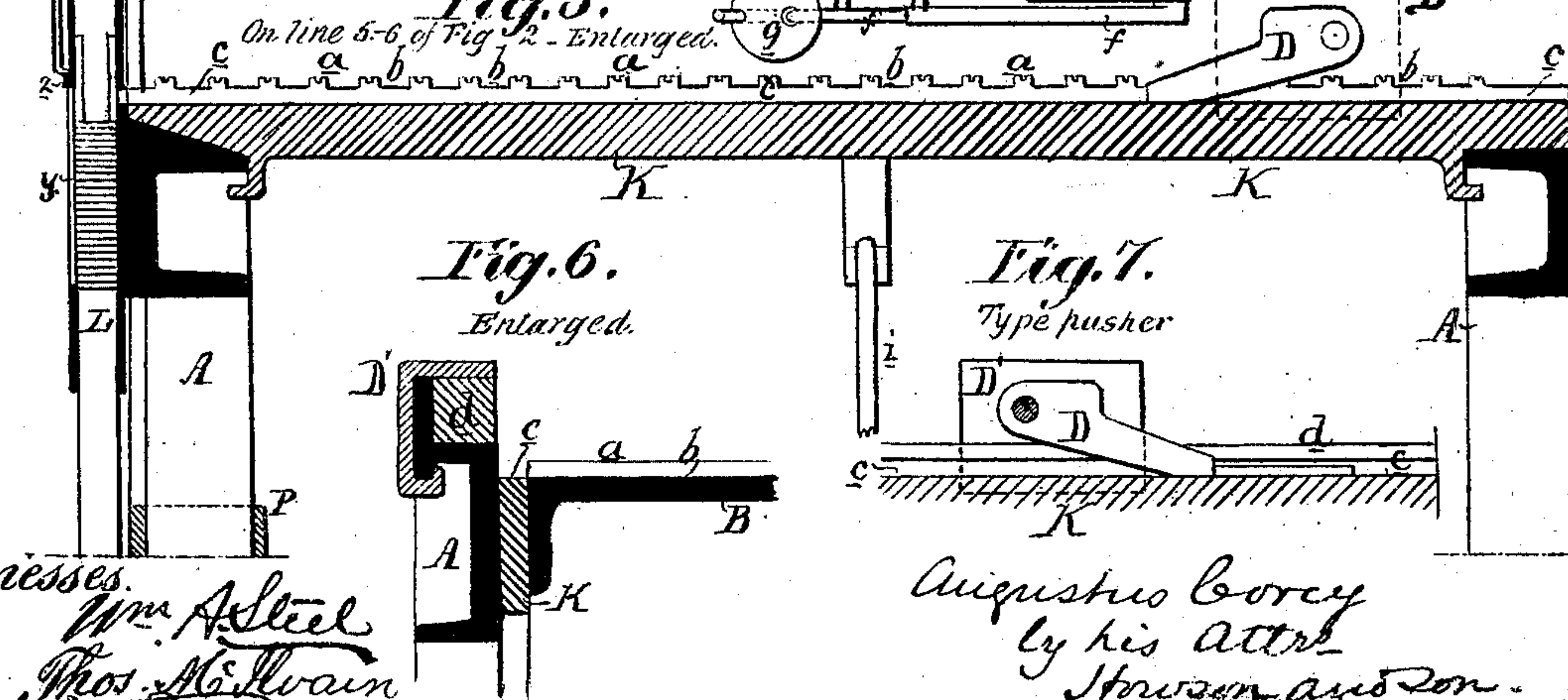
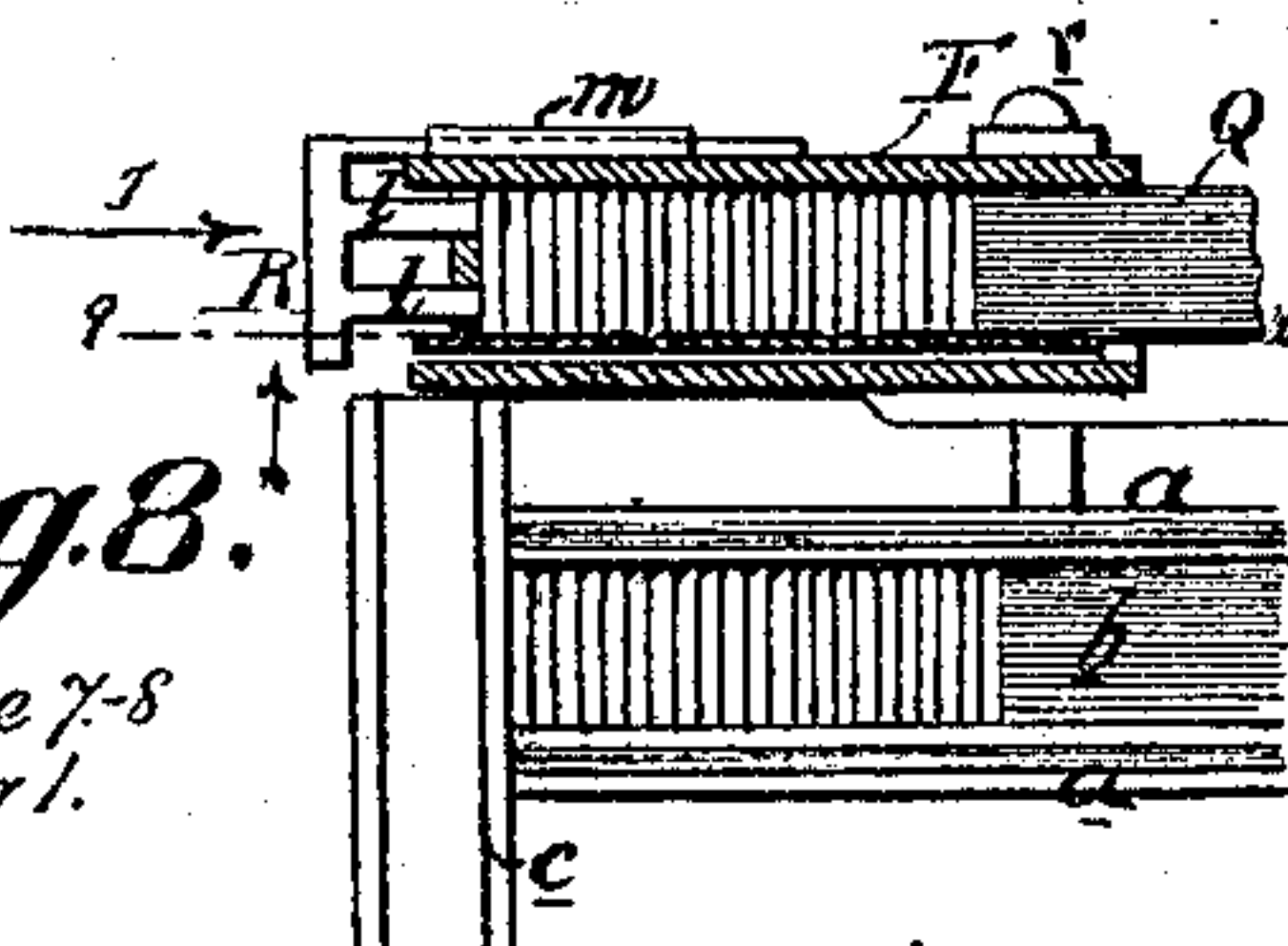


Fig. 8.
On line 7-8 of Fig. 1.



Witnesses.
Wm. A. Steel
Thos. McIlwain

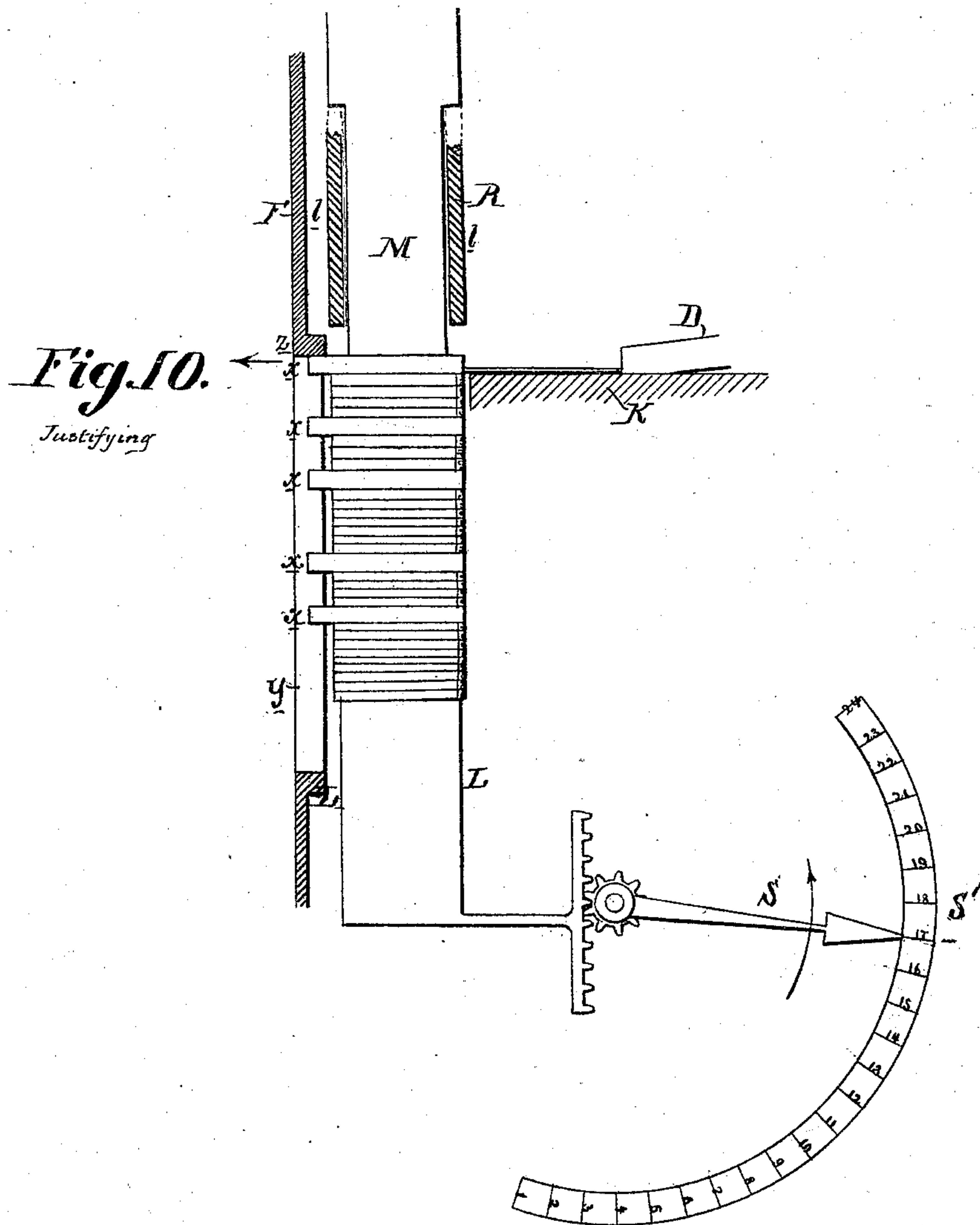
Augustus Corey
by his Attor-
Sturgeson and Son.

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Type-Setting Machines.

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Witnesses,
Wm. A. Steel
Thos. McIlwain

Augustus Corey
by his Attys
Howson and Son

UNITED STATES PATENT OFFICE.

AUGUSTUS COREY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO ALEXANDER R. HARPER.

IMPROVEMENT IN TYPE-SETTING MACHINES.

Specification forming part of Letters Patent No. 130,485, dated August 13, 1872.

SPECIFICATION.

I, AUGUSTUS COREY, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improved Type-Setting Machine, of which the following is a specification:

IMPROVED TYPE-SETTING MACHINE.

Nature and Object of the Invention.

My invention consists of certain improvements (too fully explained hereafter to need preliminary description) in type-setting machinery; the main objects of the said improvements being to enable type to be rapidly set and formed into lines, and at the same time "justified" or properly spaced between the words, so as to form lines of an even and proper length.

Description of the Accompanying Drawing.

Figure 1 is a front view of my improved type-setting machine; Fig. 2, a transverse section on the line 1 2, Fig. 1; Fig. 3, a plan view; Fig. 4, a sectional plan on the line 3 4, Fig. 1; Fig. 5, a sectional elevation on the line 5 6, Fig. 2, drawn to an enlarged scale; Fig. 6, an enlarged view of part of Fig. 2; Fig. 7, a detached view of the type-pusher; Fig. 8, a detached sectional plan on the line 7 8, Fig. 1; Fig. 9, a detached sectional elevation of the type-box on the line 9 10, Fig. 8, looking in the direction of the arrow; and Fig. 10, Sheet 2, a diagram illustrating the method of "justifying" or of properly spacing the type by means of the machine, so as to form lines of an even length.

General Description.

The frame of the machine consists of a table, A, having a flat top, B, upon which are secured any suitable number of parallel ribs, *a*, the spaces *b* between which form receptacles for the type, the latter being arranged transversely in the said receptacles, as plainly shown in Fig. 8. The ribs *a* are also grooved to form receptacles for "capital" type, which are placed longitudinally or end to end in the said grooves, and at right angles to the type in the receptacles *b*. A groove, *c*, extends across the whole of the type-receptacles at the front end of the same, and in this groove is

arranged to slide a pusher-bar, D, by which the type, as they are successively introduced into the groove from the receptacles, are thrust forward into a type-box, F, more particularly referred to hereafter. The pusher-bar D is pivoted to a block, D', which embraces and slides upon a flanged guide, *d*, on the edge of the table, and the said block is connected, by a rod, *e*, to the arm *f* of a transverse rock-shaft, G, hung to the under portion of the table, and provided with an arm, *f*¹, connected to the arm *f* by a brace, *f*², and adapted for the retention of an adjustable weight, *g*. The shaft G has also at its opposite or rear end another arm, *f*³, connected to the arm *f*¹ by a rod, *f*⁴, and connected also by a rod, *h*, to a lever, H, hung to a cross-bar, *h*^{*}, at the rear of the table; the said lever being in turn connected by a rod, *h*['], to a treadle, J, which is hung to a rock-shaft, I, adapted to suitable bearings in the lower portion of the table. The pusher-bar D is operated or thrust forward, through the medium of the above devices, by means of the weight *g*, the pressure of the foot upon the treadle serving merely to draw back the said pusher-bar. The groove *c*, in which the pusher-bar slides, has a movable bottom, consisting of a rising and falling bar, K, (Figs. 2, 5, and 6,) guided at each end, and so operated by a rod, *i*, and arm *i*['] on the rock-shaft I, that when the pusher-bar is drawn back the said bar shall be raised so as to be flush with the surface of the table or bottoms of the type-receptacles, but so that it shall be depressed during the movement of the said pusher-bar. The latter is pivoted, as before mentioned, to the block D', so that it may yield and permit the bar K to be thus raised and lowered. The type-box F, before referred to, is arranged at one end of the table, and has at one side, directly opposite the end of the groove *c*, an opening for the admission of the type, which are thrust forward by the pusher-rod. The space within the box is of just sufficient length and width to contain a type, and each type as it is admitted is received between two vertical sliding bars, L and M, arranged within the box, the bar L serving as a supporter for the type which are thrust into the box one above the other to form a line, and the said bar being, with the type already

admitted, thrust downward by the upper bar M, after the introduction of each new type. The bar M is limited in its downward movement by a shoulder, *j*, which strikes the top of the box, and which only permits the said bar to thrust down the line to an extent equal to the thickness of one type, in order to afford room for the next type introduced by the pusher-bar D. (See Fig. 9.) The bar M is attached by a hook or otherwise, so as to be readily disconnected to and operated by a sliding frame, P, adapted to a fixed portion of the table A, and receiving its motion from the treadle J, through the medium of a lever, K, and connecting-rod K'. (See Figs. 1, 2, 4, and 5.)

Each line of type, as it is set up within the box F, is raised, by means of the supporting bar L, to a position between a block, Q, within the said box and a forked bar, R, adapted to guides *m* on the outside of the box, and arranged to slide toward or from the said block Q. (See Figs. 8 and 9.) The forks *ll* of the bar R pass through openings cut in the front of the box, and can be caused to bear against the line of type so as to push the latter back into the box in order to afford space for the formation of a new line, the block Q yielding and sliding back also when this pressure is brought to bear against the type. The lower end of the type-depressing bar M is cut away on each side, as best observed in Fig. 5 and in the diagram, Fig. 10, in order to permit the passage around and to the rear of the same of the forked arms *ll* of the bar R, the object of which will be hereafter described.

An indicating or registering device, S, consisting of a graduated arc or plate and an indicating lever, is arranged beneath the type-supporting bar L in such a position as to be operated by the same in order to indicate the length of the line set up, and thus facilitate the operation of "justifying," as hereafter described.

The operation of the machine is as follows: The several receptacles upon the table A, and the grooves in the ribs *b*, are filled with type, and with blanks or spaces to be interposed between the type, and to be used in "justifying," &c. The type which it is desired to feed into the box F is drawn forward by hand, out of its receptacle *b*, into the groove *c*, or is lifted out of the receptacle *a* and placed in said groove in advance of the pusher-bar D, the movable bottom of the said groove being, when the type is thus introduced, elevated, as shown in Fig. 6, so as to permit the type to pass readily onto the same, but being depressed the instant the pusher-bar advances, so as to permit the said type to drop below the surface of the table. The said groove also is of only sufficient width to receive a single type, so that the one which follows shall be merely brought up to the edge of the groove without overhanging the same, and without incurring the risk, therefore, of being struck by the advancing pusher-bar. The type hav-

ing been thus introduced into the groove, the pressure of the foot of the operator is removed from the treadle J, when, by means of the weight *g* and the devices described, the pusher-bar will be suddenly thrust forward and will push the type before it into the box F, between the bars M and L. The treadle J is then forced down in order to withdraw the pusher-bar to its original position and elevate the movable bottom K of the groove *c*, and at the same time to push the type downward in the box F by means of the bar M, operated, as before described, by the treadle. As soon as this has been accomplished another type is introduced into the groove *c*, and thrust forward by the pusher-bar into the type-box above the one before admitted. This second type is also thrust downward by the bar M, which is again raised in order to permit the introduction of a third type, and the operation is thus continued by feeding in type and spaces until a line of the desired length has been set up. After thus completing a line, the pusher-bar is drawn back, and the whole line is lifted, by means of the supporter L, until brought to a position opposite the block Q, as shown in Fig. 9, the bar M, after being disconnected from the frame P, being raised out of the way by the pressure of the type against its lower end. The whole line of type is then pushed back into the box (in the direction indicated by the arrows 1 in Figs. 9 and 10) by means of the forked bar R.

When but a short line of type is set up and the bar M is not raised by the same to a position above the bar R, the forked ends *ll* of the latter pass around or on either side of the reduced portion of the said bar M, so as not to be obstructed by the latter when pushing back a line of type. (See Fig. 10.) After pushing back one line of type the parts are restored to their original positions, and another line is set up, raised, and pushed back as before, the operation being thus continued until the desired number of lines have been completed, when the machine is stopped and the set-up matter removed from the box.

It will be observed, on reference to Figs. 8 and 9, that the type-box F is attached to the frame or table A by a single bolt, *r*, close to its rear end, and that it rests upon and is supported at its front end by a bracket, *r'*, projecting from the table A. This method of connection enables the type-box to be tilted or inclined backward, as indicated by dotted lines in Fig. 9, for convenience of access to the line of type which is being set up should any accident occur. A vertical slot, *y*, in the edge of the box opposite the line-forming space, enables access to be thus obtained to the type when necessary. The top B of the table may, if desired, be inclined sufficiently to permit the type to fall by their own weight into the groove *c*, but in such case each receptacle would have to be furnished with a valve or gate operated by a key under the control of the operator.

The operation of "justifying" or of properly spacing the words so as to form lines of an even or proper length is performed by the machine as follows, reference being had to the diagram, Fig. 10, and it being supposed that lines of exactly two inches in length are to be set up: The indicator S, which I prefer to make vertically adjustable upon the frame or table A, is so set that its pointer shall remain at rest at the point 1 until a line two inches long has been set up, and so that as soon as the line attains this length the type-supporter L shall commence to turn the pointer in the direction of its arrow, and continues to turn it as the line is increased in length and the type-supporter descends. In setting up, the line blanks or "em-quad" spaces x (to be afterward withdrawn) are introduced between the words in place of or in addition to the usual spaces. These spaces x may be about one-eighth or four-thirty-seconds of an inch in thickness, and are what are commonly known by printers as "em-quads," (long primer.) The arc of the indicator is so marked off that each graduation shall represent the distance to which the pointer will be turned by the introduction into the line of a type of one-quarter the thickness of a space x or "em-quad," after the setting up of a line of two inches in length. A space, x , therefore, introduced into the line after the latter attains a length of two inches will depress the type-supporter sufficiently to turn the pointer to the extent of four graduations. This being understood, it will be evident that the five spaces x , shown in the diagram, would, if introduced into the line after the latter had attained a length of two inches, so depress the type-supporter as to turn the pointer to the extent of twenty graduations. This is borne in mind by the operator, who continues to set up type and increase the line in length over two inches, until the index points to one of the graduations in the neighborhood of the twentieth. In the diagram the index is represented as pointing to the seventeenth graduation, which, being three short of the twentieth, indicates to the operator that, after the withdrawal of the five "em-quads" or spaces x , the line of type will be three thirty-seconds of an inch short of two inches, and that in order to "justify" or bring the line to a proper length he will have to introduce a space or spaces of a thickness equal to three thirty-seconds of an inch. Three of what are known among printers as "4-em spaces," each equal to one-quarter of an "em-quad" or space x , would answer the purpose. This calculation having been made by means of the indicator, the operator proceeds to withdraw the spaces x from between the type and to introduce in their stead thin or "4-em" spaces required to fill out the line. The extra spaces x are of somewhat greater length than the type, and also somewhat narrower, (although of greater thickness,) so that they may project beyond the type through a slot, y , in

the rear of the box, as shown, the said slot being made too narrow to permit any of the type to escape through or project into the same. In order to remove the spaces x the type-supporter and line of type are raised until the uppermost space is brought in contact with a stop, z , on the box, as shown in the diagram. This stop is so arranged that the space x , when arrested by the same, shall be directly opposite the groove c , so that it can be forced outward from between the type either by the pusher-bar D or by the thinner space which is to take its place. This is the readiest way of ejecting the extra spaces x ; but when made of a greater length than the type, as above described, they can, if desired, be seized between the thumb and finger, and be thus drawn out without raising the line.

It is not absolutely necessary that the extra spaces should be longer than the type, as they may be of the same length, or even shorter; nor is it necessary that the said extra spaces shall be "em-quads," one-eighth of an inch in thickness, as thicker or thinner spaces may be used, providing that they bear a certain definite relation to the graduations of the indicator, and that the exact distance which the pointer will be moved by the introduction into the line of one or more of the said spaces is known to the operator.

It will be evident that the devices for operating the pointer by the downward movement of the type-supporter can be variously modified, and that lines of any desired length can be "justified" by the machine in the manner above described.

The devices for operating the several parts of the machine may also be modified by substituting a second treadle for the weight g , but I prefer to use the latter.

Claims.

1. In a type-setting machine, the combination, substantially as described, of two sets of receptacles, a and b , for the type, the receptacles a consisting of grooves formed in the ribs which intervene between the receptacles b .
2. The bar K, operated substantially in the manner described, and forming a movable bottom for the groove c .
3. The combination of the groove c and its movable bottom with the pusher-rod D, pivoted to a sliding box or frame, D', substantially as specified.
4. The combination of the treadle J and weight g , or of two treadles, J, and the devices described, or their equivalents, for raising and lowering the bar K and bar M of the type-box, substantially as herein set forth.
5. The sliding bar M attached to a weighted frame, and operated by said frame and the devices connected therewith, substantially as described.
6. The combination of the slide P and the detachable bar M, arranged to slide in the type-box, and serving as a medium for holding

back in the box the lines of type already set up.

7. The combination, substantially as described, of the bar R, having forked ends *l l*, with the reduced lower end of the plunger-bar M.

8. The method of justifying, by means of thick temporary detachable spaces *x*, an index graduated in respect to the size of said spaces, as described, and an indicator, S, all operating together, as set forth.

9. The slot *y* in the back of the type-box, in combination with the narrow spaces *x*, for the purpose specified.

10. The stop *z*, formed in the type-box, on a line with or nearly on a line with the groove *c*, as described, in combination with the spaces *x*, longer than the type.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AUGUSTUS COREY.

Witnesses:

WM. A. STEEL,

JOHN K. RUPERTUS.