

(No Model.)

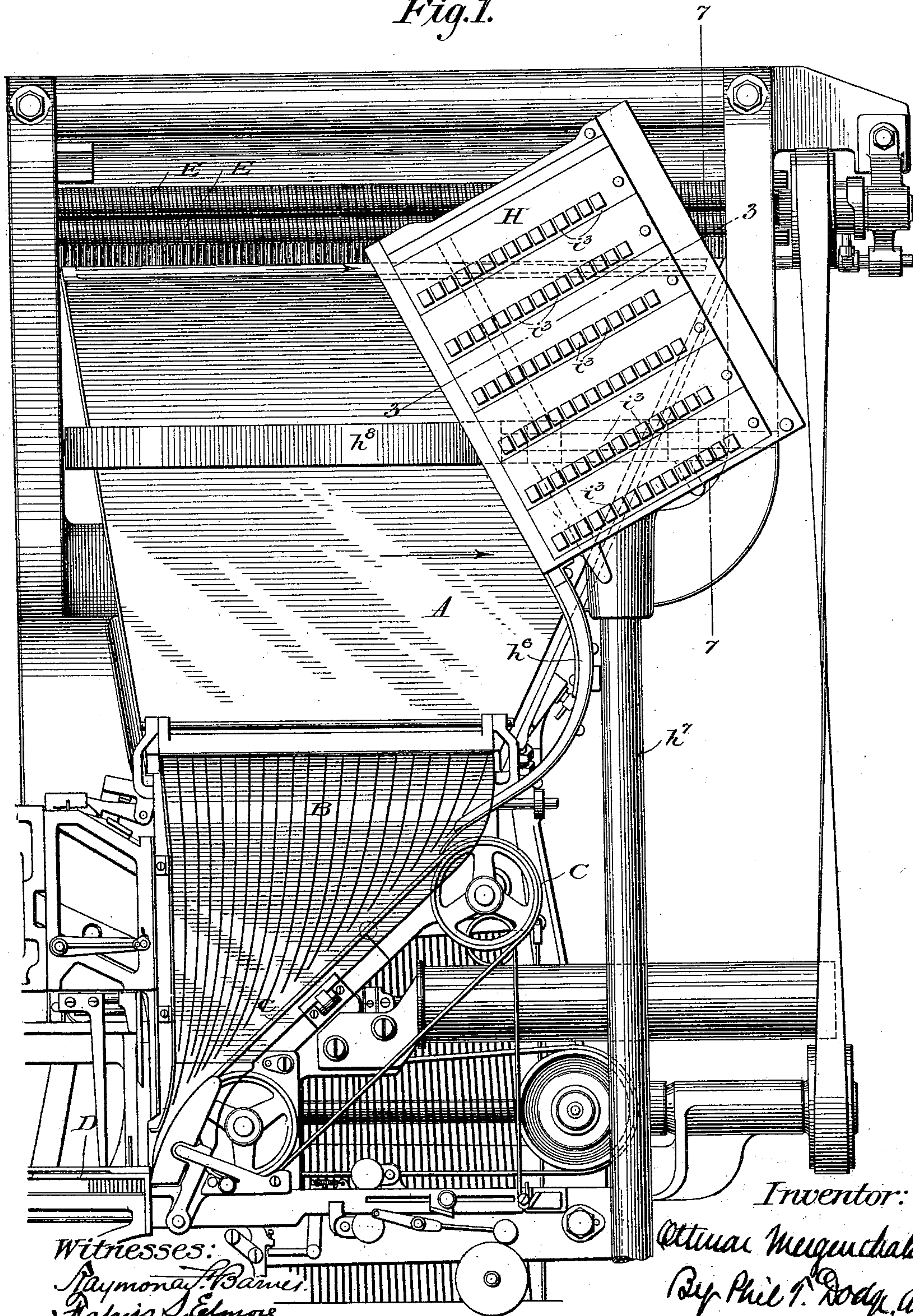
5 Sheets—Sheet 1.

O. MERGENTHALER.
LINOTYPE MACHINE.

No. 543,497.

Patented July 30, 1895.

Fig. 1.



Witnesses:
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Fahis J. Elmore

Inventor:
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By Phil T. Dodge, atty

(No Model.)

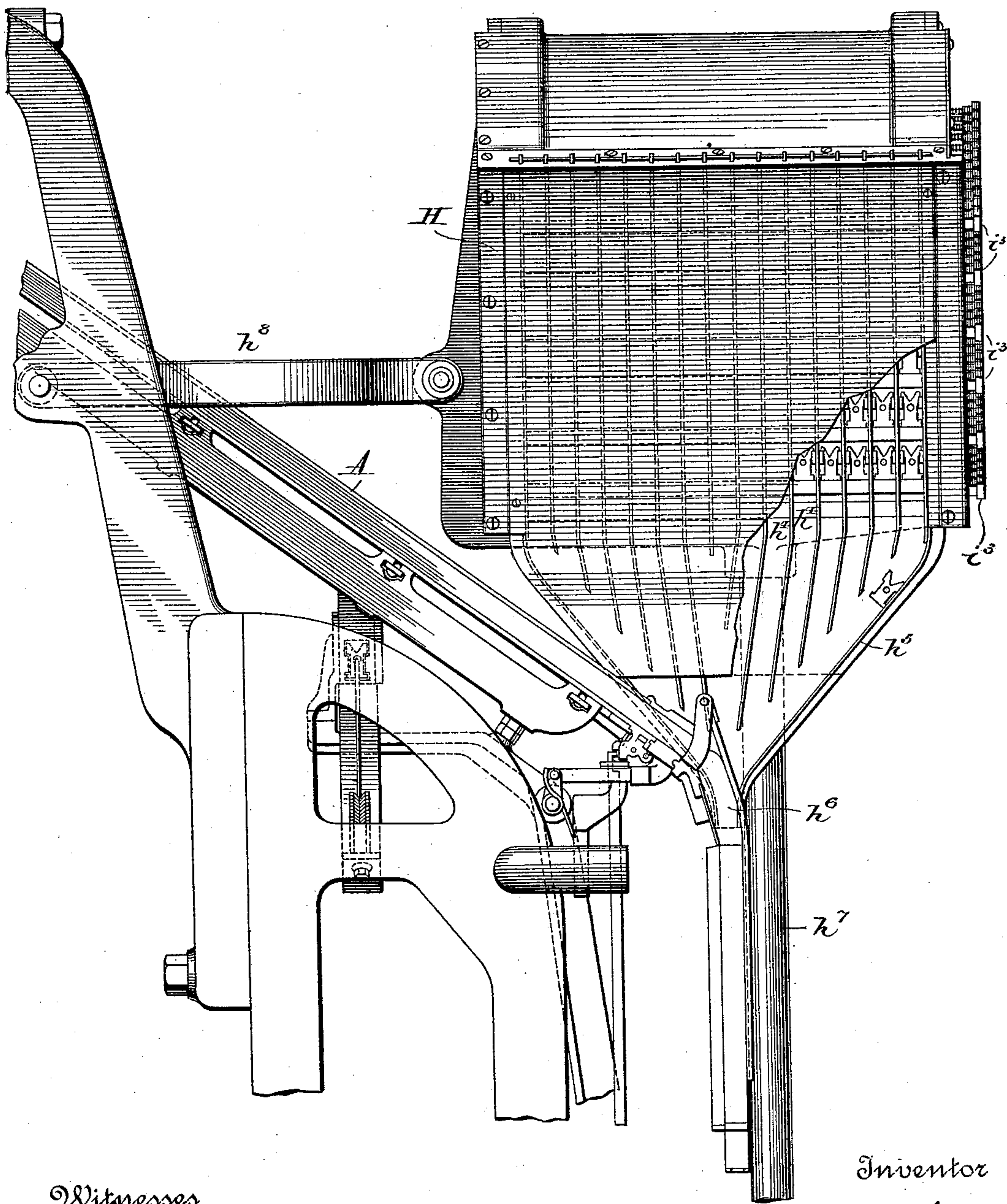
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Fig. 2.



Witnesses

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Fig. 3.
on line 3-3.

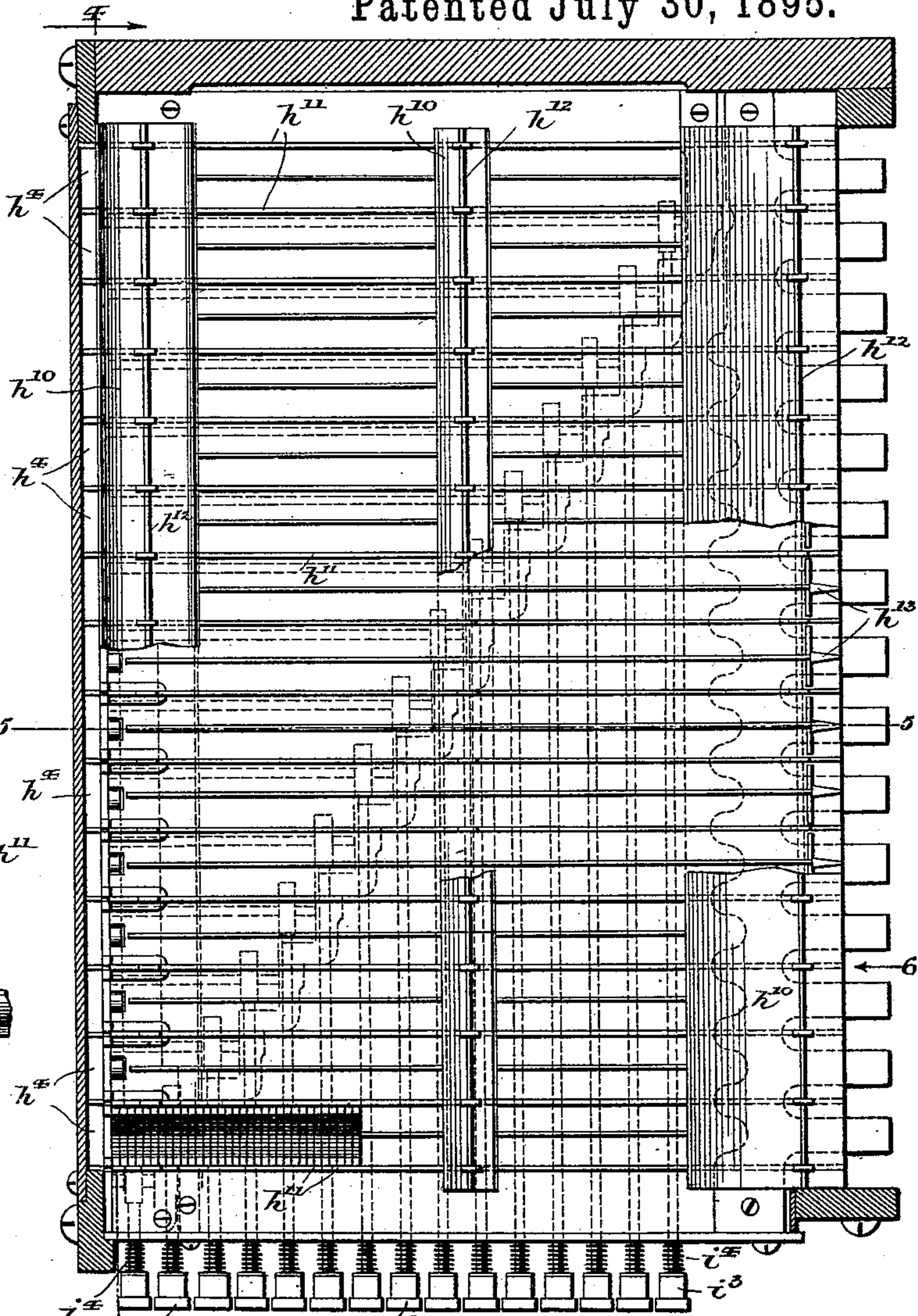


Fig. 6.

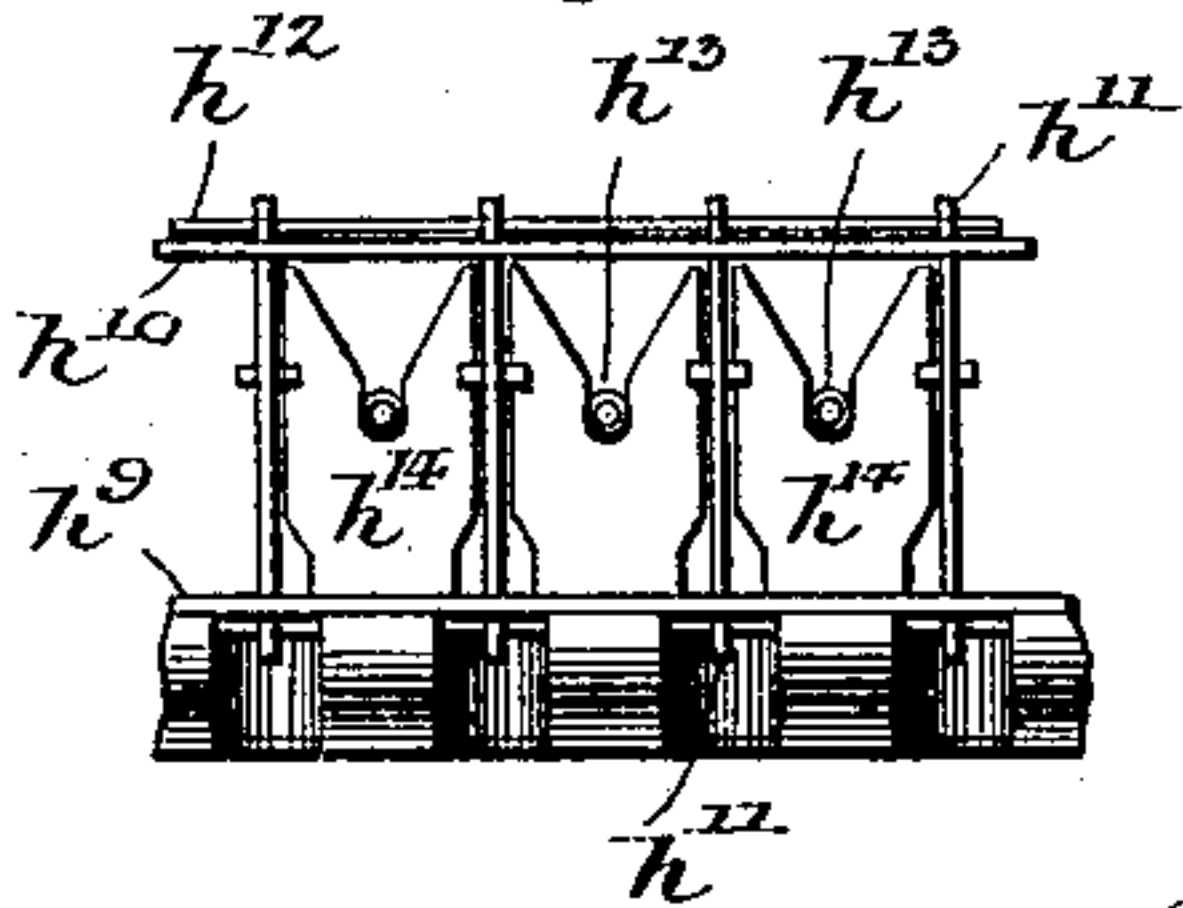


Fig. 4.

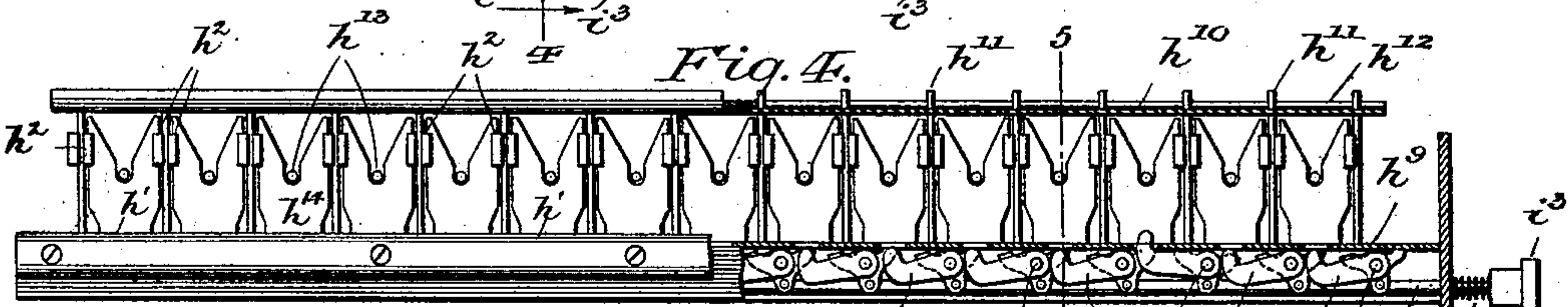
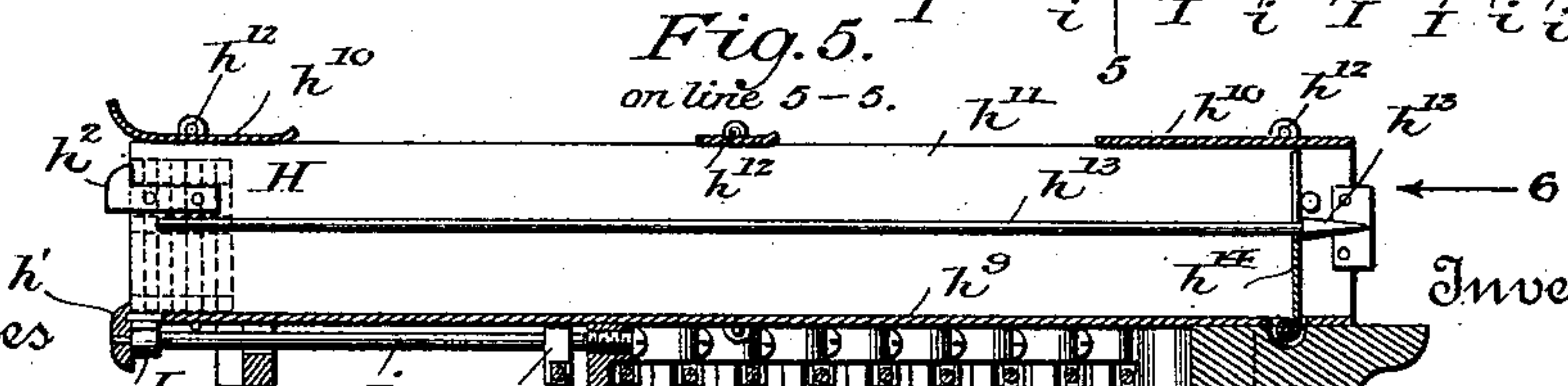


Fig. 5.
on line 5-5.



Witnesses

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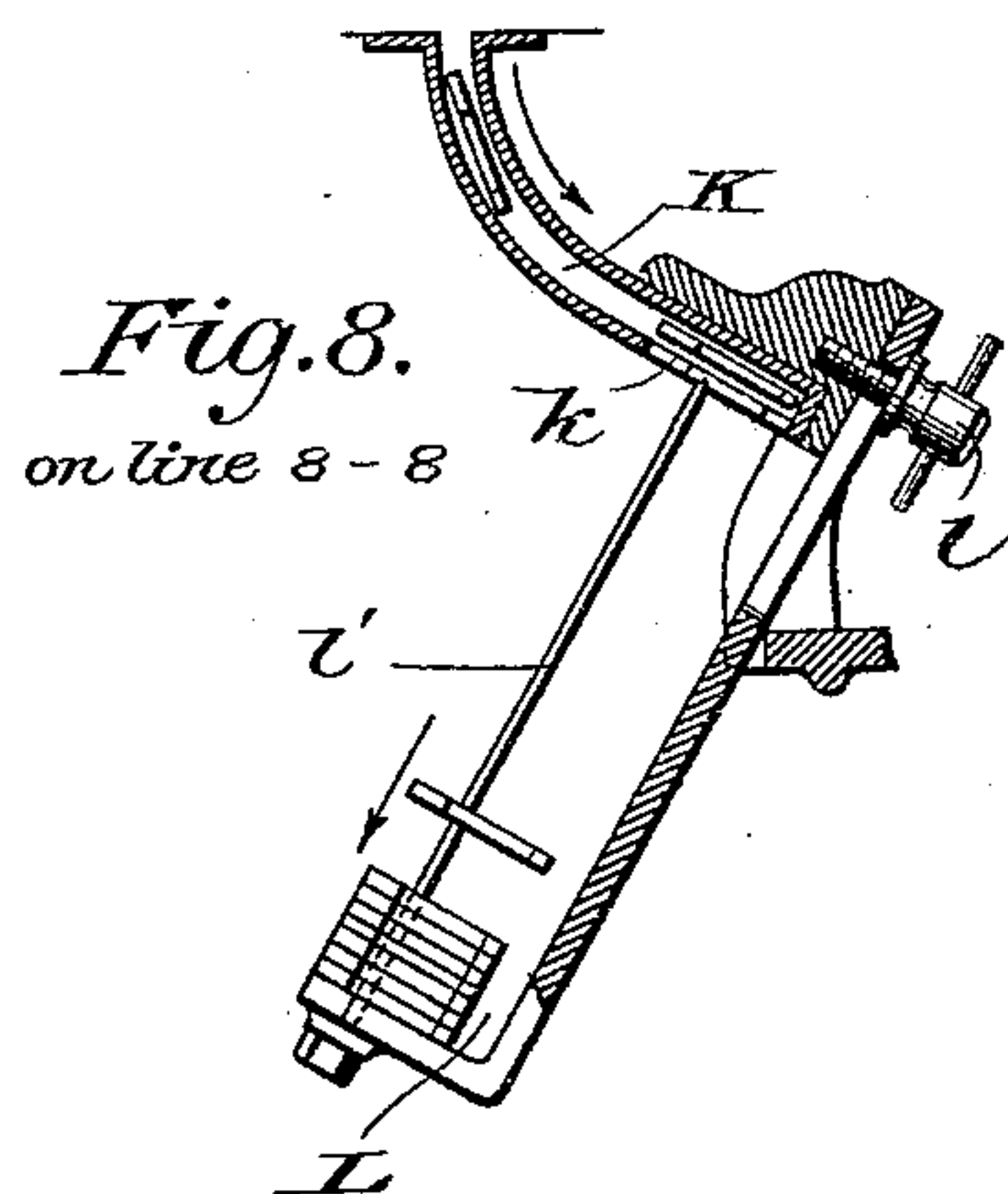
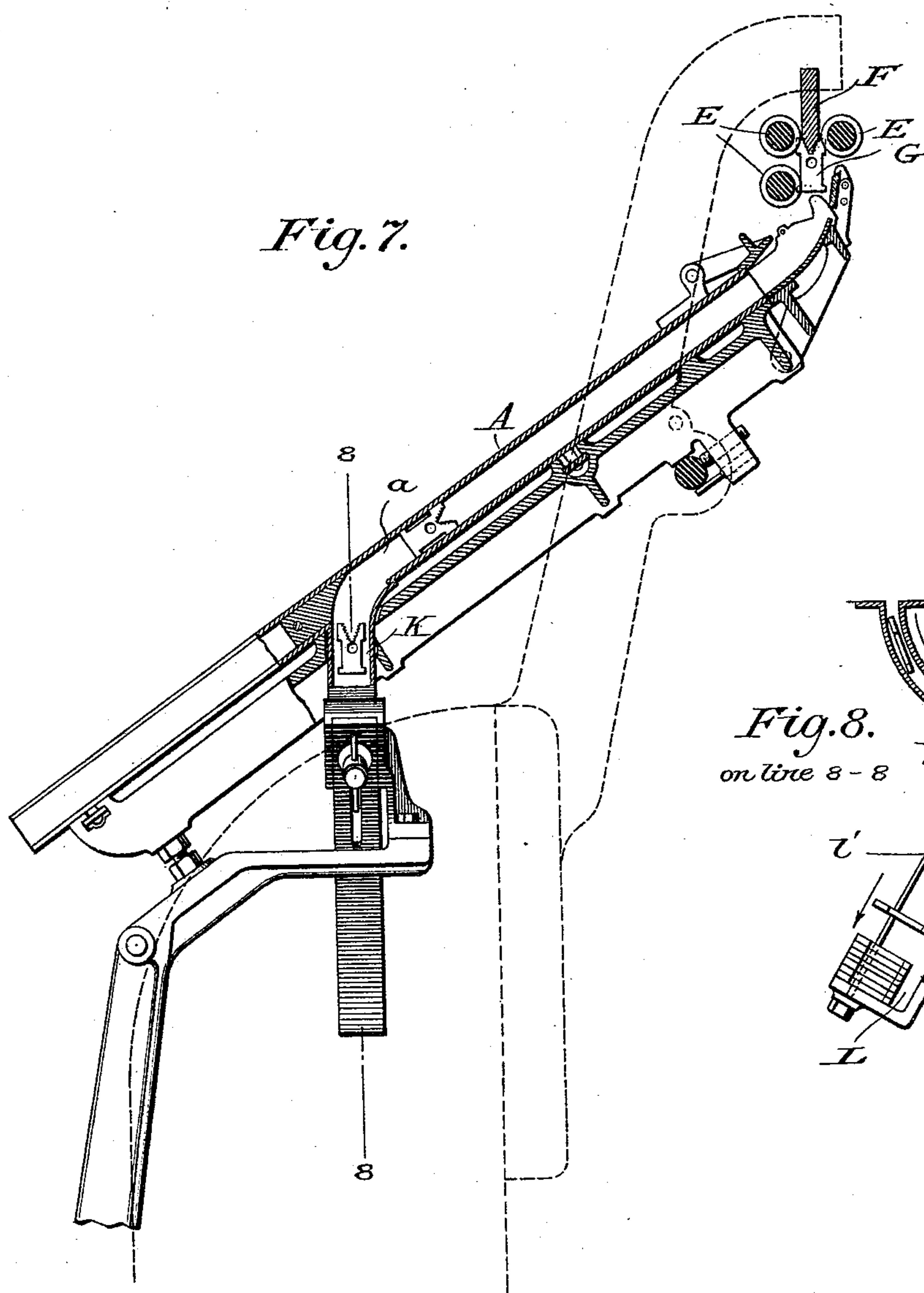
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5 Sheets—Sheet 5.

0. MERGENTHALER.
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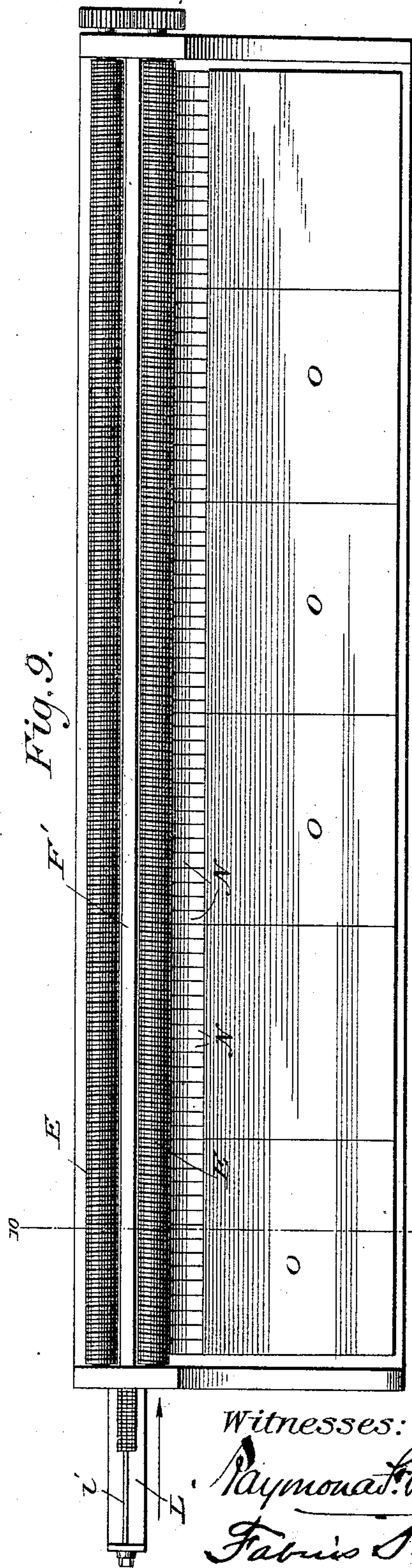


Fig. II.

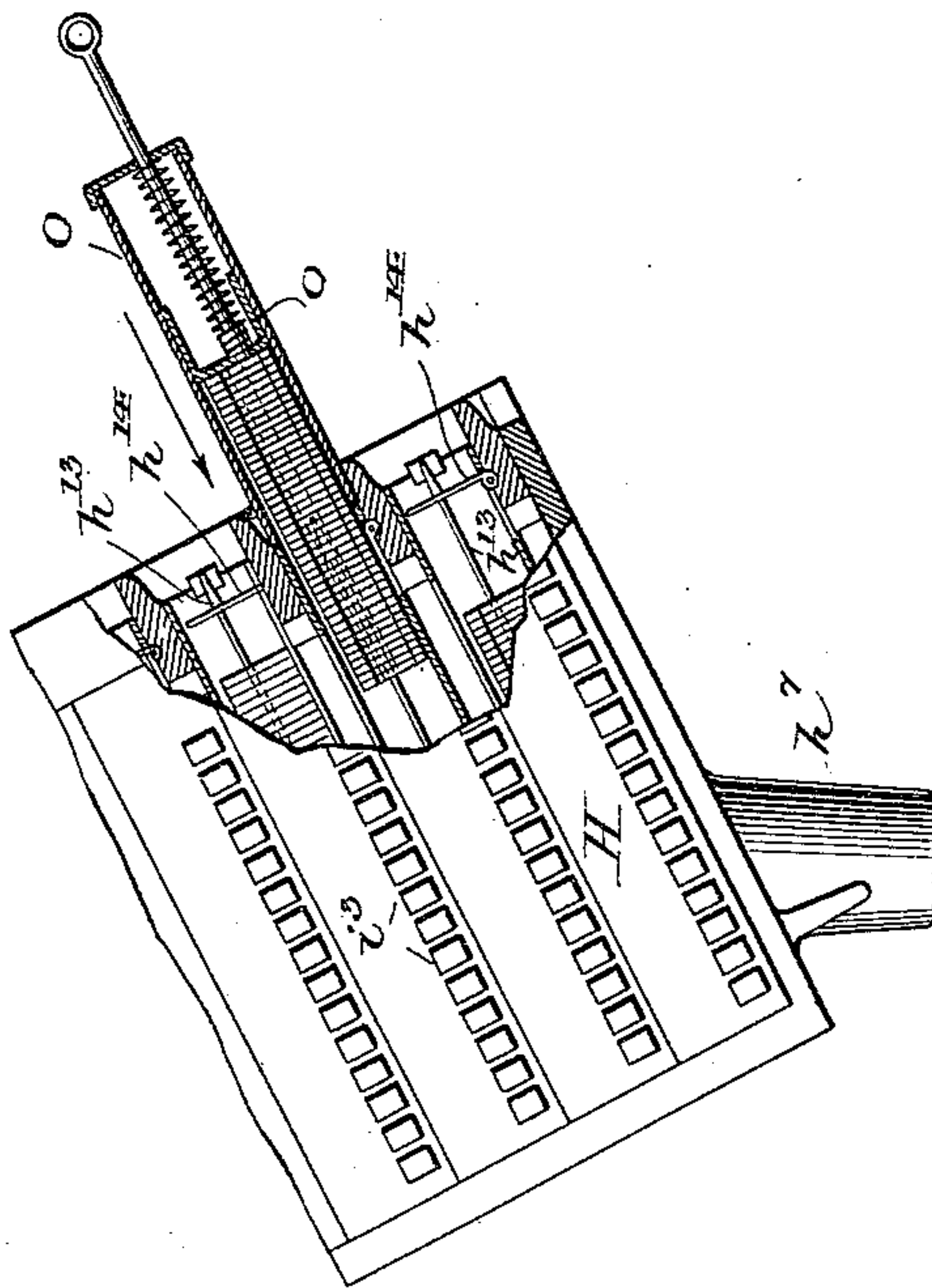
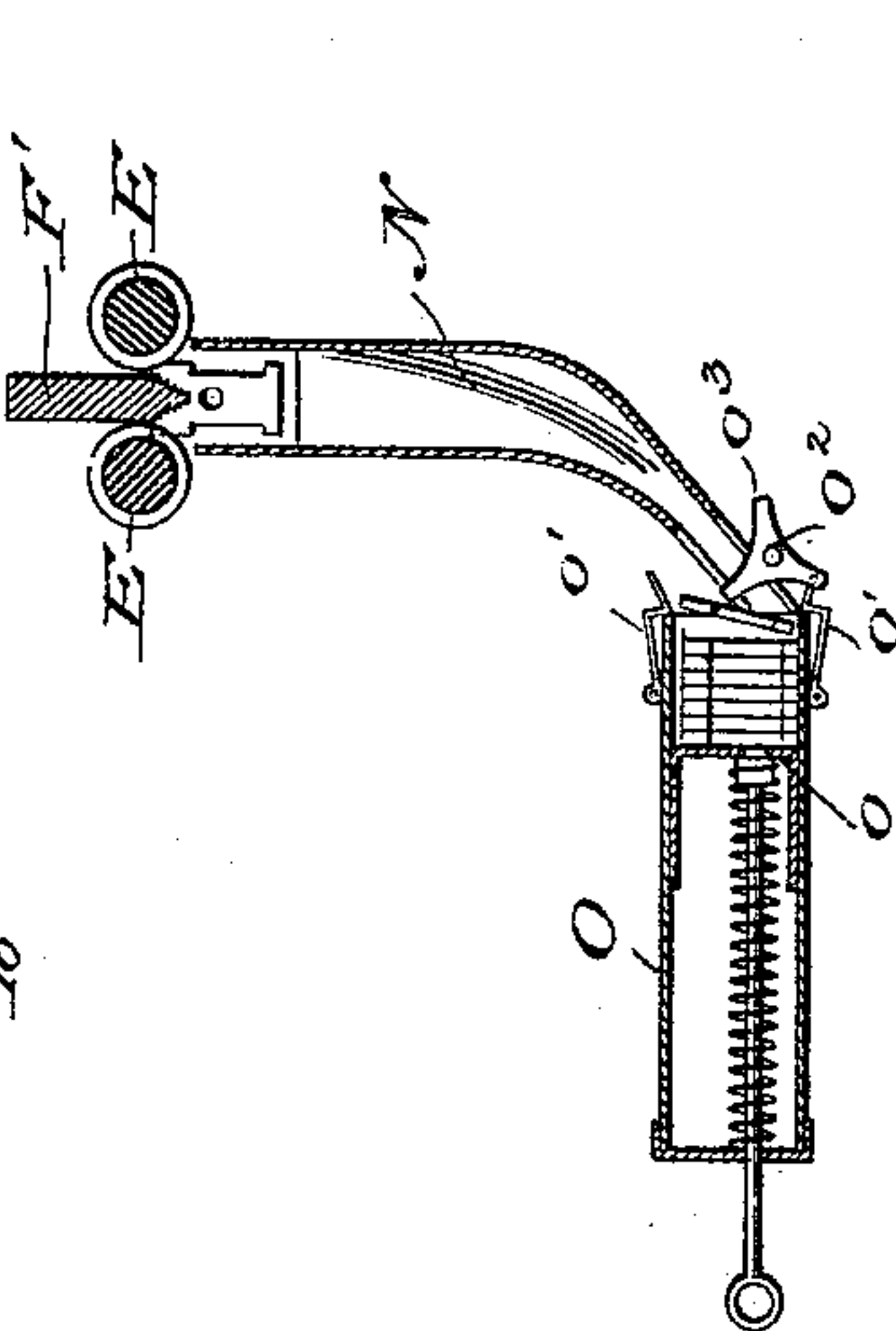


Fig. 10.
on line 10-10.



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UNITED STATES PATENT OFFICE.

OTTMAR MERGENTHALER, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE
MERGENTHALER LINOTYPE COMPANY, OF NEW YORK, N. Y.

LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 543,497, dated July 30, 1895.

Application filed April 12, 1893. Serial No. 470,007. (No model.)

To all whom it may concern:

Be it known that I, OTTMAR MERGENTHALER, of Baltimore, State of Maryland, have invented a new and useful Improvement in Linotype-Machines, of which the following is a specification.

At the present day composing mechanisms, whether intended for composing ordinary printing-type or for assembling lines of matrices from which to cast linotypes, are commonly actuated by finger-keys representing the various characters, the machine being adapted to compose or assemble in line only such characters as are represented in the key-board. In practice it is frequently desirable to use additional characters. The object of my invention is to provide a supplemental or secondary mechanism by means of which these extra characters may be speedily introduced into the line composed by the usual mechanism.

To this end it consists, broadly, in combining with a composing mechanism a secondary or supplemental mechanism adapted to contain extra type or type-matrices and to deliver these matrices one at a time as demanded to the primary mechanism in such manner that the type from the two will be assembled in a common line.

In the accompanying drawings I have represented my invention embodied in the form adapted for use in connection with the well-known Mergenthaler linotype-machine, such as represented in Letters Patent of the United States dated September 16, 1890, No. 436,532; but it will be understood after reading this specification that the invention may be embodied in various forms and modified in detail to suit the requirements of the particular machine with which it is to be employed.

In the drawings I have represented only so much of the Mergenthaler machine as is necessary for an understanding of my improvement, and reference may be had for a detailed description of the remaining portion to the patent above named.

Figure 1 is a front elevation of the magazine, composing mechanism, and distributor of a Mergenthaler machine having my improvement applied thereto. Fig. 2 is a side elevation of the parts shown in the preceding

figure, looking in the direction indicated by the arrow thereon. Fig. 3 is a section through my supplemental magazine on the line 3 3, Fig. 1, looking in the direction indicated by the arrow. Fig. 4 is a vertical cross-section through the base of the magazine on the line 4 4 of Fig. 3, looking in the direction indicated by the arrow, and showing particularly the devices for releasing the matrices. Fig. 5 is a vertical section from front to rear through one of the magazine-channels on the line 5 5 of Fig. 3. Fig. 6 is a view looking into the outer or rear ends of a small number of the magazine-channels in the direction indicated by the arrows bearing like numbers in Figs. 3 and 4. Fig. 7 is a vertical section through the main distributor on the line 7 7 of Fig. 1, showing the manner in which the extra matrices, technically known as "sorts," are delivered. Fig. 8 is a cross-section on the line 8 8 of the preceding figure. Fig. 9 is a top plan view showing a distributing mechanism such as may be employed to arrange the sorts-matrices in tubes for introduction into the supplementary magazines. Fig. 10 is a cross-section of the same on the line 10 10. Fig. 11 is a front elevation of the supplementary magazine, with portions broken away and shown in vertical section, illustrating the manner in which the assorted matrices are returned to said magazine.

Referring to the drawings, A represents the inclined stationary magazine provided with channels in which the type-matrices are contained and from which they are delivered by a finger-key mechanism, one at a time, through the vertical guides or channels B to an inclined carrying-belt C, by which they are transferred, one after another, to the slotted assembling-block D, in which they are set up side by side in a row or line preparatory to their being transferred to the casting mechanism by which the linotype or slug is produced against them.

E E are horizontal screws lying above the upper end of the magazine and serving to carry the matrices along a distributor-bar F, from which the matrices are suspended by teeth in their upper ends engaging longitudinal teeth on the bar, the teeth of the bar and matrices being arranged or permuted in such

manner that each matrix is returned to the upper end of the channel from which it was delivered at the lower end.

The foregoing parts are all constructed and arranged to operate in the ordinary manner and therefore need no further description herein.

In applying my improvement I provide a supplemental magazine or matrix-holder, which is preferably constructed in the form and supported in the manner now to be described. As shown, it consists of a rectangular box or chamber H, arranged in an inclined position and containing a large number of channels or passages extending therethrough from the rear or right under side downward and forward toward the left in an inclined manner. These channels may be formed in any suitable way, provided they are each adapted to receive a row or line of matrices H', standing preferably on end, side by side, so that they will tend to move downward through the channels by gravity. At its lower end each channel is provided with upper and lower shoulders h' and h^2 , as shown in Figs. 2, 3, 4, and 5, adapted to engage, respectively, with the upper shoulders of the matrices and with their lower ends in order to hold them in check and prevent the line from sliding out of the magazine. Each channel has two of the upper shoulders h^2 engaging the ears at opposite sides of the forward matrix of the line, so that when the matrix is lifted it may fall forward between the upper and over the lower shoulder and thus escape from the channel. This delivery of the matrices is effected, as shown in Figs. 3, 4, and 5, by lifting-dogs I, mounted on rock-shafts i and each having an upturned end adapted to ride through the bottom of one of the channels in position to act upon and lift the foremost matrix. The rock-shafts are in turn provided at their rear ends with short crank-arms i' , each connected to a sliding rod i^2 , carried through the front side of the magazine and provided with a push-button i^3 and with an encircling-spring i^4 , by which the rod is pushed outward, so as to hold the corresponding delivery-dog I in a depressed position, as plainly shown in Figs. 3 and 4. It will be seen that the various buttons or finger-pieces are grouped in rows at the front side of the magazine within reach of the operator at the front of the machine, so that the operator reaching upward and pressing inward on the button representing the required sorts character may effect the delivery of the matrix bearing that character from its containing-channel. The supplemental magazine contains in the lower inclined side, as shown in Figs. 2 and 3, upright channels h^4 , extending past the delivery ends of the matrix-channels, so that the matrices delivered into these secondary channels h^4 are permitted to pass downward to the bottom of the magazine, which is constructed with converging sides h^5 , (see Fig. 2,) whereby the matrices are conducted, one after another, into the

central delivery-tube h^6 , Figs. 1 and 2, which is so formed as to guide and deliver the matrices flatwise upon the upper end of the conveyor-belt C, whereby they are carried downward and delivered to the line in course of composition in the same manner that matrices from the main magazine A are delivered.

The supplemental magazine may be conveniently supported in position by a leg h^7 to rest upon the floor and by an arm h^8 connecting it with the distributor-frame of the machine. By disconnecting this arm the supplemental magazine is set free, so that it may be removed, leaving the machine in its original condition. The magazine, as shown in the drawings, is composed of a large number of magazine-channels arranged in horizontal and vertical rows, and it will of course be understood that the delivery-dogs and their operating devices will be arranged in a corresponding manner.

I have shown the magazine as built up in a series of horizontal sections, such as shown in Fig. 4, laid one over another in the external supporting-frame. This construction admits of the sections being built in duplicate and of the magazine being increased in capacity to any desired extent by simply adding sections, one after another, at the top. The sections referred to consist each of top and bottom plates h^9 and h^{10} and the intervening vertical division-plate h^{11} , having their upper and lower edges provided with ears which are projected through holes in the top and bottom plates and secured by transverse wires h^{12} , passed through the series of ears, as plainly shown in Figs. 3, 4, and 6.

The sorts-matrices have their distributing-teeth so constructed that they all continue their course along the distributor-bar F to a point at or near its right-hand end, where they are all delivered, as shown in Fig. 7, through a channel a from the magazine A into a laterally-curved tube K. (See Figs. 7 and 8.) This tube K has at its lower side an opening k , through which the matrices fall sidewise into a receiving device L, in which they are piled up by gravity, one after another, in line, as shown in Fig. 8. This receiving device, which is secured by a screw l , that it may be removed at will, may be made either of the form shown or of any other form which will cause the matrices delivered through the sorts-tube to assemble themselves in line. I prefer to provide each of the sorts-matrices with a hole through the middle, as shown, and to provide a receiving device with a wire or pin l' , having its end presented in such position that the matrices will pass down thereon and thus be strung upon the wire. The sorts-matrices having been thus delivered automatically from the machine after use, may be returned to the supplemental magazine in any suitable manner. In order, however, to facilitate the operations of sorting or classifying the matrices and returning them to the magazine, I propose to make use of a

distributing mechanism, such as shown in Figs. 9, 10, and 11, of practically the same form as that employed on the machine, and consisting of the horizontal distributor-bar 5 F' , having permuted teeth along its lower edge to co-operate with the correspondingly permuted teeth of the sorts-matrices, so as to drop the latter according to the characters which they bear at different points in the length of the distributor. Screws E are arranged to feed the matrices along the distributor and channels N are arranged below the distributor to receive them. These channels N are so twisted or shaped as to cause the 15 matrices to turn over and slide sidewise out of the lower end. The frame of the distributor is adapted to receive below the tube N a series of receiving or charging tubes O , with their upper ends in position to receive the matrices from the tubes N . There will be one of the tubes O opposite each tube end, intended to receive a particular letter or character. Each charging-tube contains a spring-pressed slide or follower o , against which the 25 incoming matrices are assembled, being held by means of retaining-hooks o' .

The distributor contains a shaft o^2 , provided with angular wheels o^3 , by which the descending matrices are delivered into the 30 respective tubes O . Each tube O , after being filled with matrices bearing a particular character, is inserted into or applied against the upper rear end of the corresponding channel in the supplemental magazine and the 35 matrices then pushed forward by the stem of the follower into the magazine in the manner plainly indicated in Fig. 11.

In order to prevent the matrices in the supplemental magazine-channel from falling over 40 on their sides, I propose to place in each channel the longitudinal wire h^{13} , to extend through the holes in the matrices, the upper ends of these wires being made with conical or arrow shaped heads, as represented in Fig. 11, that 45 the matrices may pass freely over them. These wires are sustained at the upper ends in the upper notched end of plates h^{14} , which are adapted to turn forward and downward that the matrices may pass over them into 50 the channels, as shown in Fig. 11. When the plates h^{14} are turned down by the matrices passing over them, the rods h^{13} may slide forward until they contact with the front plate of the magazine. This movement is very slight, 55 and when the hinged plates h^{14} rise to their normal positions they act against the heads h^{13} of the rods and draw them back to their original positions, so as to leave space for the escape of the matrices past their forward ends.

It is to be understood that the wires h^{13} may be omitted or replaced by any other means for preventing the matrices from falling on their 60 sides—such, for instance, as shoulders or ribs along the walls of the channels, as used in other parts of the machine to bear beneath the shoulders at the upper ends of the matrices.

It is to be clearly understood that while I

prefer a magazine in substantially the form herein shown, with matrix delivering or discharging devices of the character represented, 70 my invention is not restricted thereto. The only requirement is that the supplemental magazine should be adapted to contain the sorts-matrices and to deliver the selected matrices into the machine proper so that they may 75 pass into the line being composed; and the skilled mechanic will understand that the typical construction herein set forth may be widely varied within the range of mechanical skill and without departing from the principle 80 of operation hereinbefore explained.

It will be understood that my improvement is applicable not only to machines in which the matrices or intaglio characters are employed, but also to machines in which punches 85 or cameo characters are employed to produce matrix impressions in papier-maché or analogous material, and I have therefore made use of the word "type" in its generic sense in the following claims to include both matrices 90 and punches.

Having thus described my invention, what I claim is—

1. In combination with a composing mechanism and its magazine, a supplemental or 95 independent magazine, adapted to deliver its type to the first named mechanism.

2. In combination with a composing mechanism and its magazine, having a carrier to advance the type toward the composing point, 100 a supplemental magazine, also arranged to deliver its type to the carrier of the first named mechanism.

3. In combination with a linotype machine, containing a series of type a magazine there- 105 for and means for selecting and assembling said type in line, a detachable type-holder or magazine, adapted to deliver its type to the first named mechanism, whereby type from the two magazines may be assembled by the 110 one mechanism, either in a common line, or in different lines, as demanded.

4. The linotype machine provided with the assembling or carrying belt, the main magazine and means for delivering type there- 115 from to the belt in combination with the supplemental magazine, adapted to deliver its type to said belt.

5. In combination with a linotype machine containing a magazine and a composing 120 mechanism, a supplemental magazine, provided with a finger-key mechanism for discharging type therefrom and with means for directing said type to the composing mechanism of the machine. 125

6. In combination with a linotype machine having a composing mechanism including a magazine co-operating therewith, a supplemental magazine containing a series of in- 130 clined channels for the type, means for delivering the type individually from said channels, and converging guides by which the matrices so delivered are directed through a common passage.

7. A magazine consisting of a series of inclined storage channels arranged side by side in rows one row above another and each provided at the lower end with means for retaining the matrices and discharging them one at a time in combination with guide channels or conductors through which the discharged matrices are delivered at a common point, said guide channels extending from the upper storage channels past the ends of the storage channels thereunder whereby several storage channels are caused to deliver matrices through a common guide channel.

8. In a type magazine, an inclined channel provided with fixed type retaining shoulders at the front, in combination with a lifting dog arranged to act beneath the lower end of the type, whereby the forward type is lifted clear of the shoulders.

9. In a type magazine the inclined type channels each having fixed top and bottom shoulders at the lower end in combination with the lifting dogs arranged to act beneath the lower ends of the type, rock shafts carrying the dogs, a series of finger keys located at one side of the magazine and connections from the keys to the respective rock shafts, substantially as shown.

10. In a type magazine the series of channels inclined downward toward the delivery end and each provided with fixed retaining shoulders in combination with the lifting dogs lying transversely under the lower ends of the channels, the parallel rock shafts carrying said dogs and provided with crank arms, the finger buttons and their rods connected to the cranks and the retracting springs substantially as shown.

11. In a type magazine, an inclined type channel, provided with type retaining lips or shoulders and a longitudinal wire or rod adapted to extend through the type to maintain them in an upright position therein.

12. In combination with the perforated type, the inclined type receiving channel, means to retain the forward type, and a floating wire, within the channel, and acting to retain the type in an upright position.

13. In a type magazine the type channel therein, in combination with the floating wire and the hinged plate co-operating with the upper end of the wire.

14. In combination with the linotype machine having an outlet for sorts matrices, a series of perforated matrices and a receiver having a wire or rod on which said matrices are delivered.

15. A linotype machine provided with a distributor to deliver matrices in combination with a rod or wire to which the matrices are delivered from the distributor, and by which they are suspended side by side.

16. In combination with a linotype machine, having a type magazine a composing mechanism, and a distributor, a supplementary magazine, provided with finger keys, and adapted to deliver sorts matrices to the composing mechanism out of the machine, sorts matrices adapted to leave the distributor at a common point, a secondary distributor for the sorts matrices, and tubes adapted to receive the matrices from the secondary distributor and deliver them to the supplementary magazine.

17. The distributor consisting of the toothed bar F means for feeding the matrices along said bar, and the tubes N arranged to turn the falling matrices and deliver them side-wise, substantially as described.

In testimony whereof I hereunto set my hand this 30th day of March, 1893, in the presence of two attesting witnesses.

OTTMAR MERGENTHALER.

Witnesses:

THOS. M. DOBBIN,
WILLIAM H. BERRY.