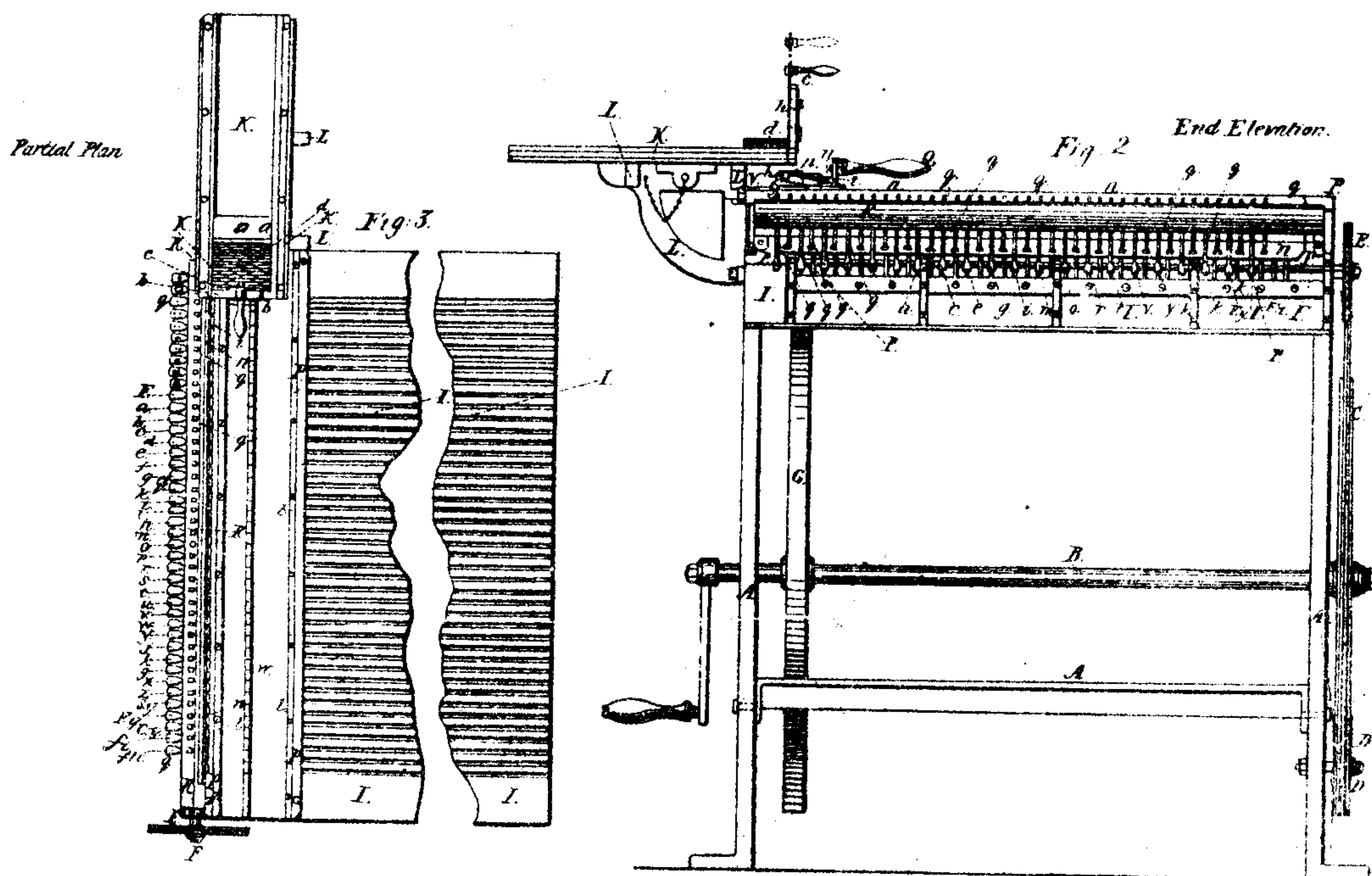
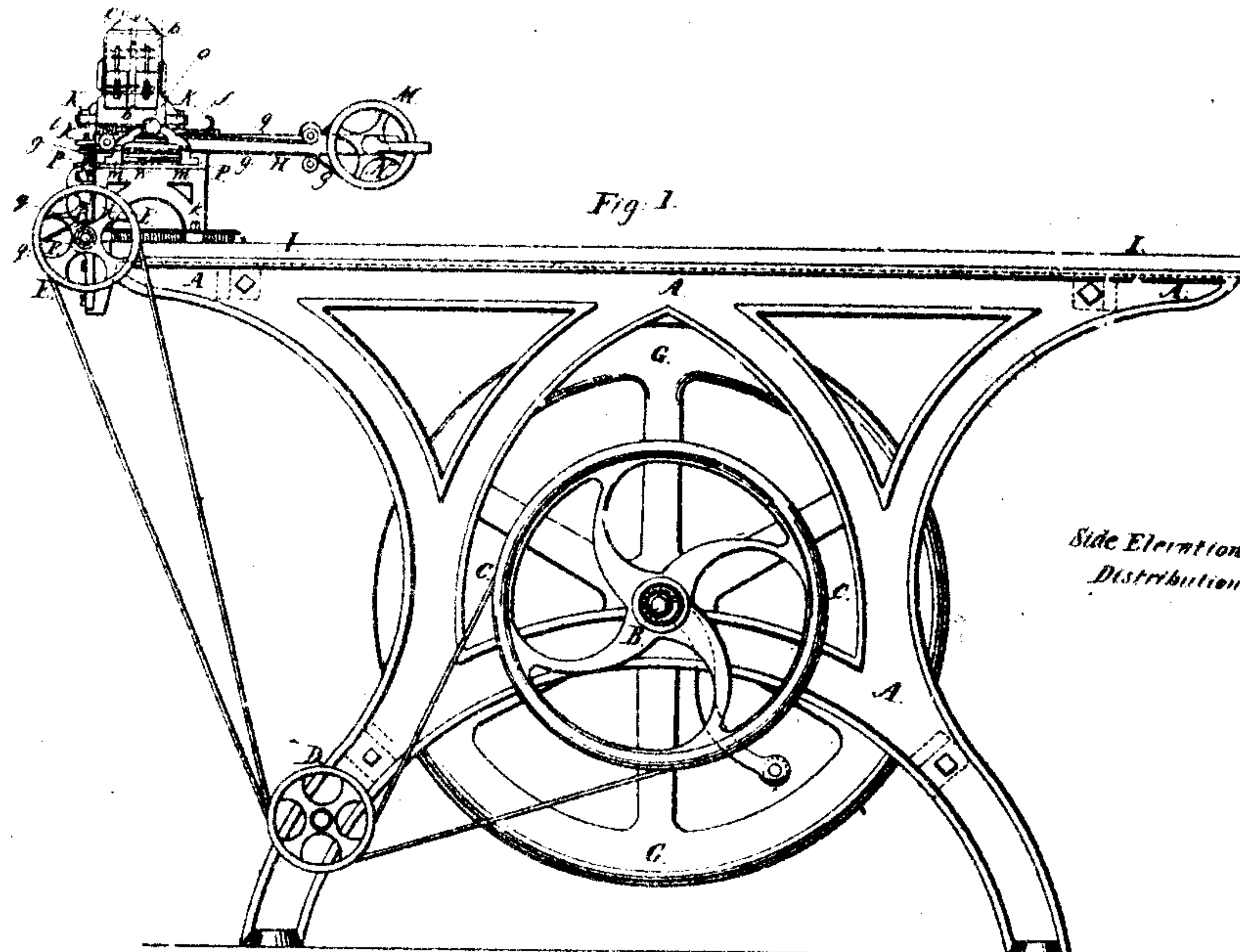


No. 3,257.

PATENTED SEPT. 9, 1843.

F. ROSENBORG.
MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS—SHEET 1.



Witnesses
J. M. H. H.
F. M. H. H.

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No. 3,257.

PATENTED SEPT. 9, 1843.

F. ROSENBORG.
MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS—SHEET 2.

Fig. 4 Part of Fig. 3 enlarged

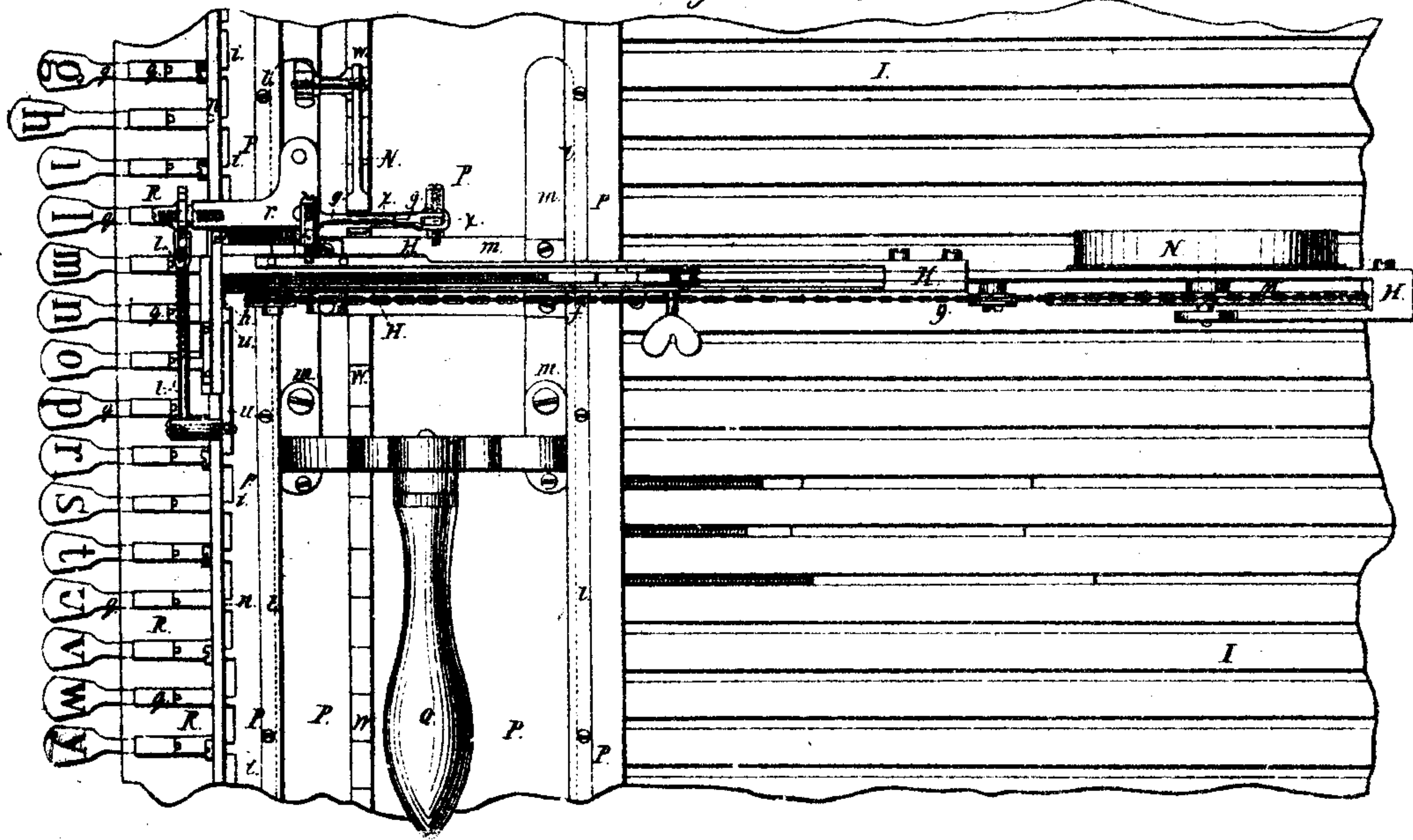
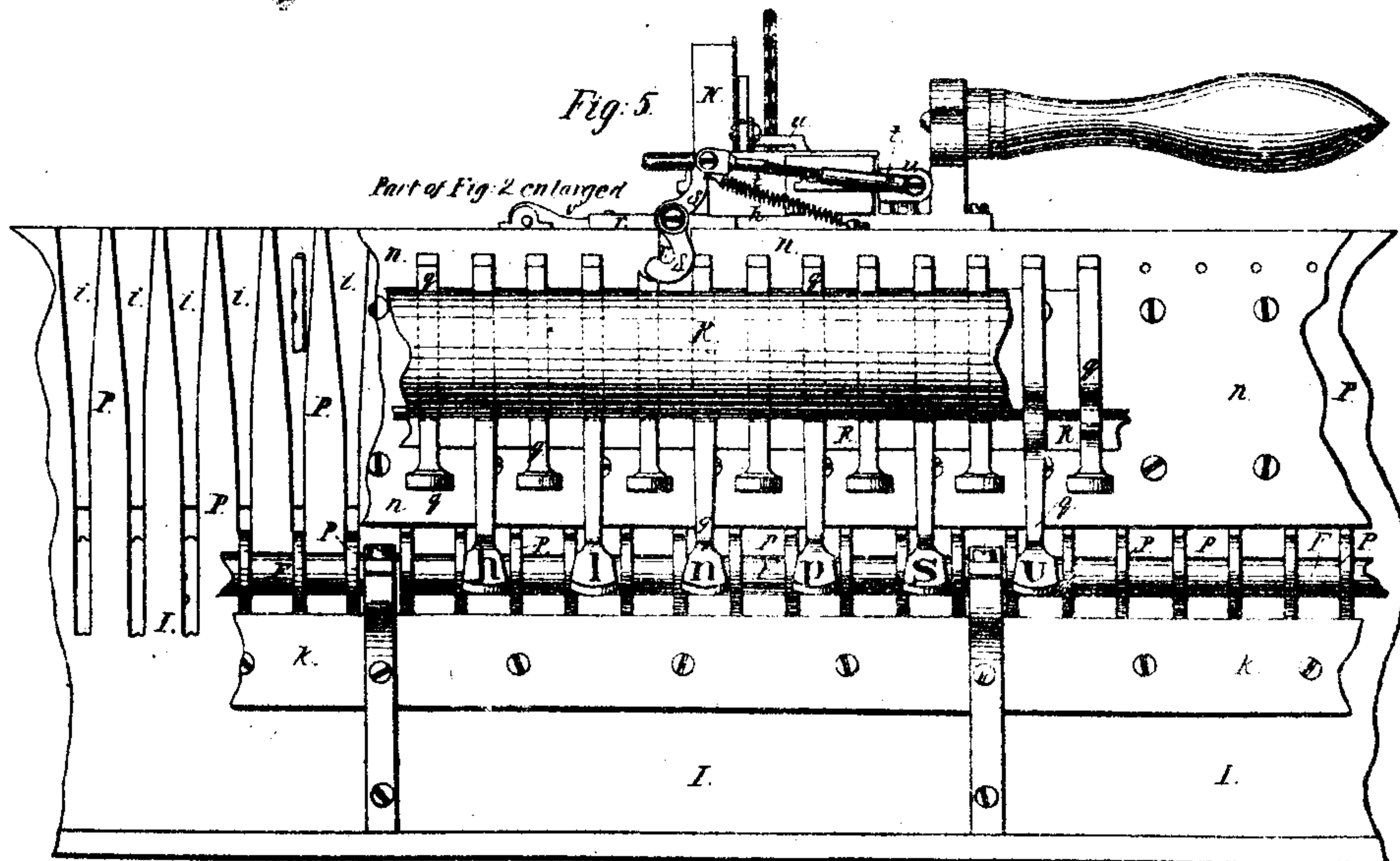


Fig. 5

Part of Fig. 2 enlarged



Figs. 2 and 3 are drawn to a scale of
a quarter of an inch to an inch.

Figs. 4 and 5 are drawn
full size.

Witnesses.
J. M. Moffatt
Fred. H. B. Den

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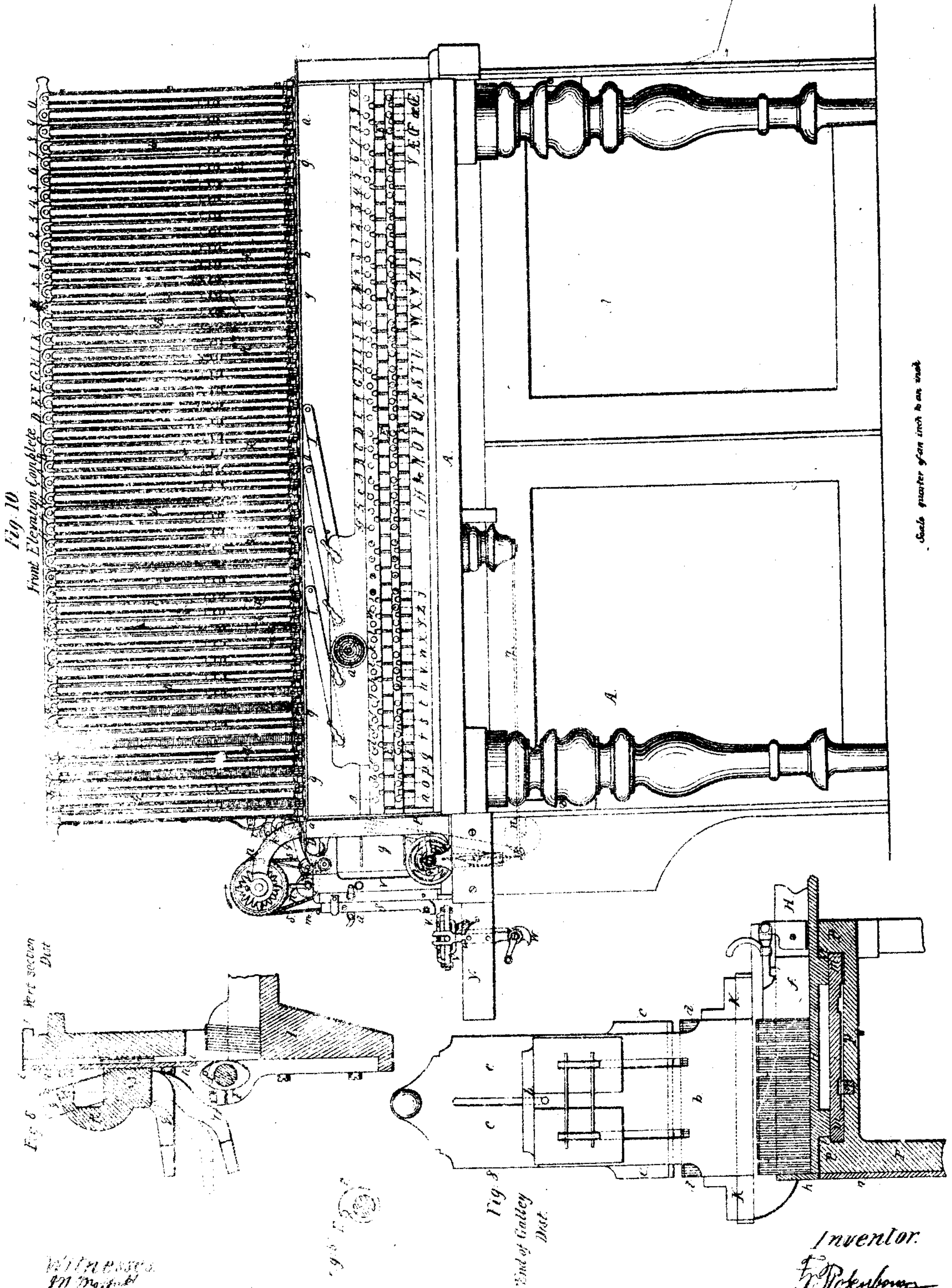
F. Rosenberg

No. 3,257.

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MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS—SHEET 3.



Scale greater than in work

Wm. P. Rogers
Jm. Moffat
J. H. Alden

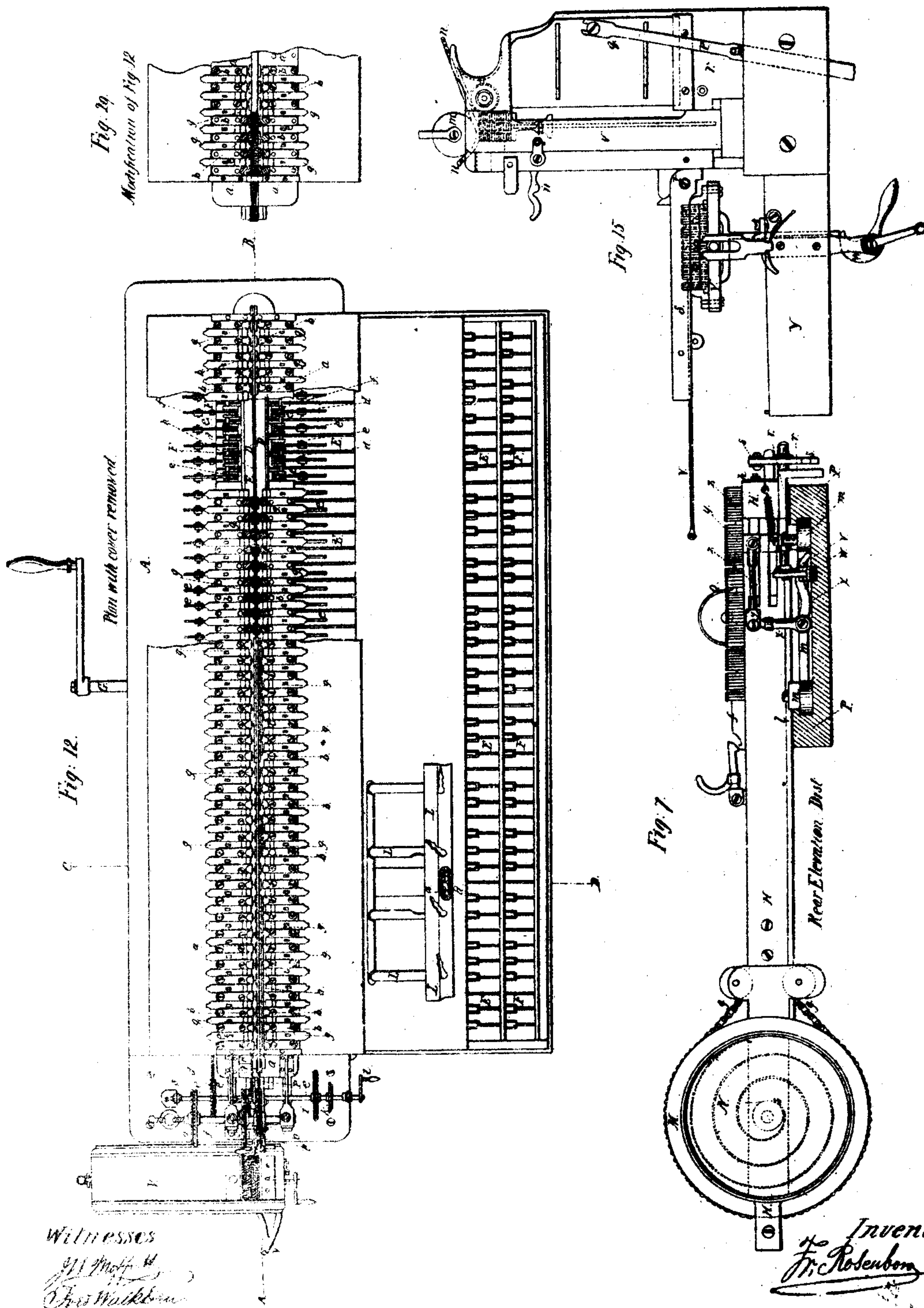
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No. 3,257.

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F. ROSENBERG.
MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS—SHEET 4.



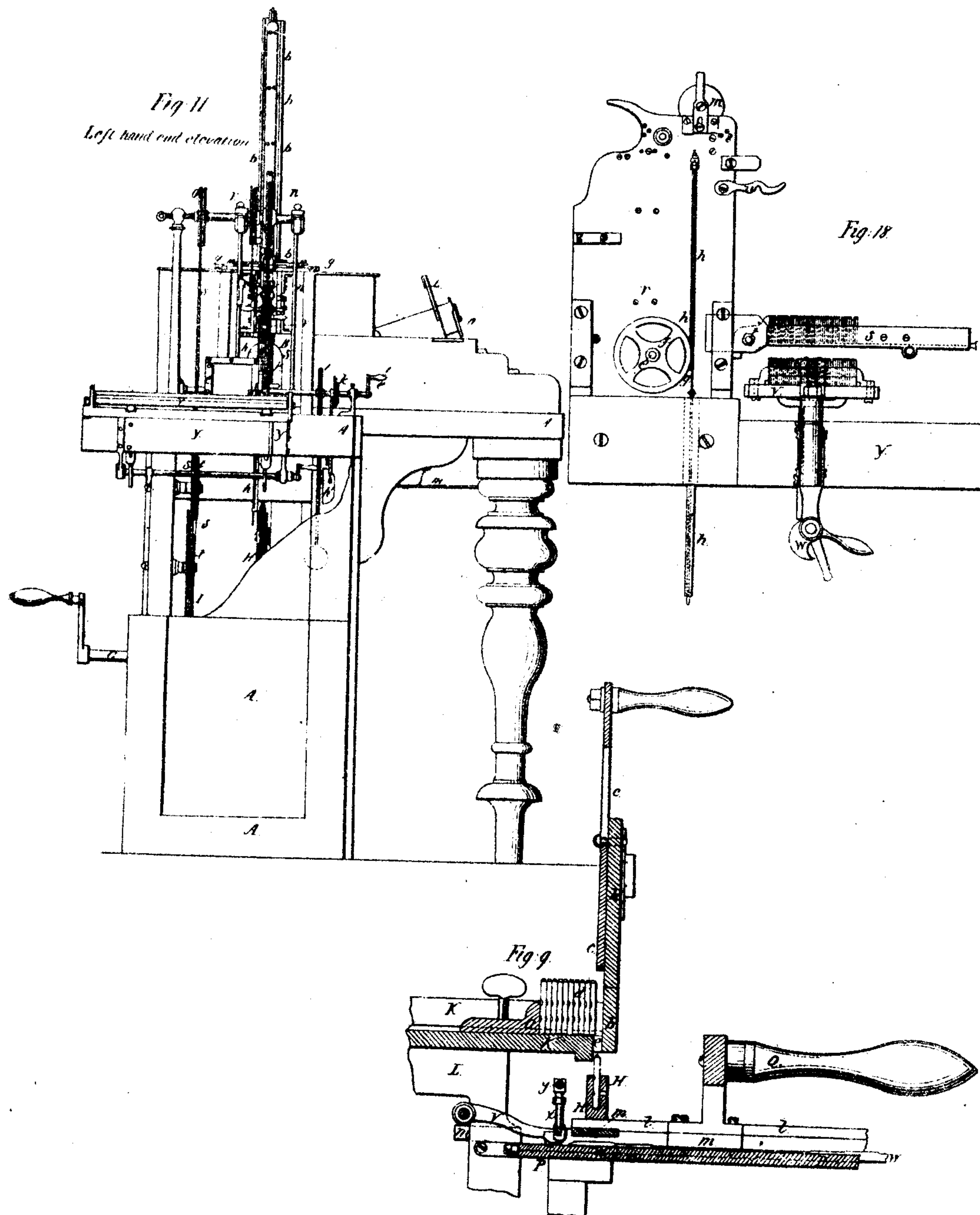
No. 3,257.

PATENTED SEPT. 9, 1843.

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MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS—SHEET 5.



Witnesses.
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Geo. H. H.

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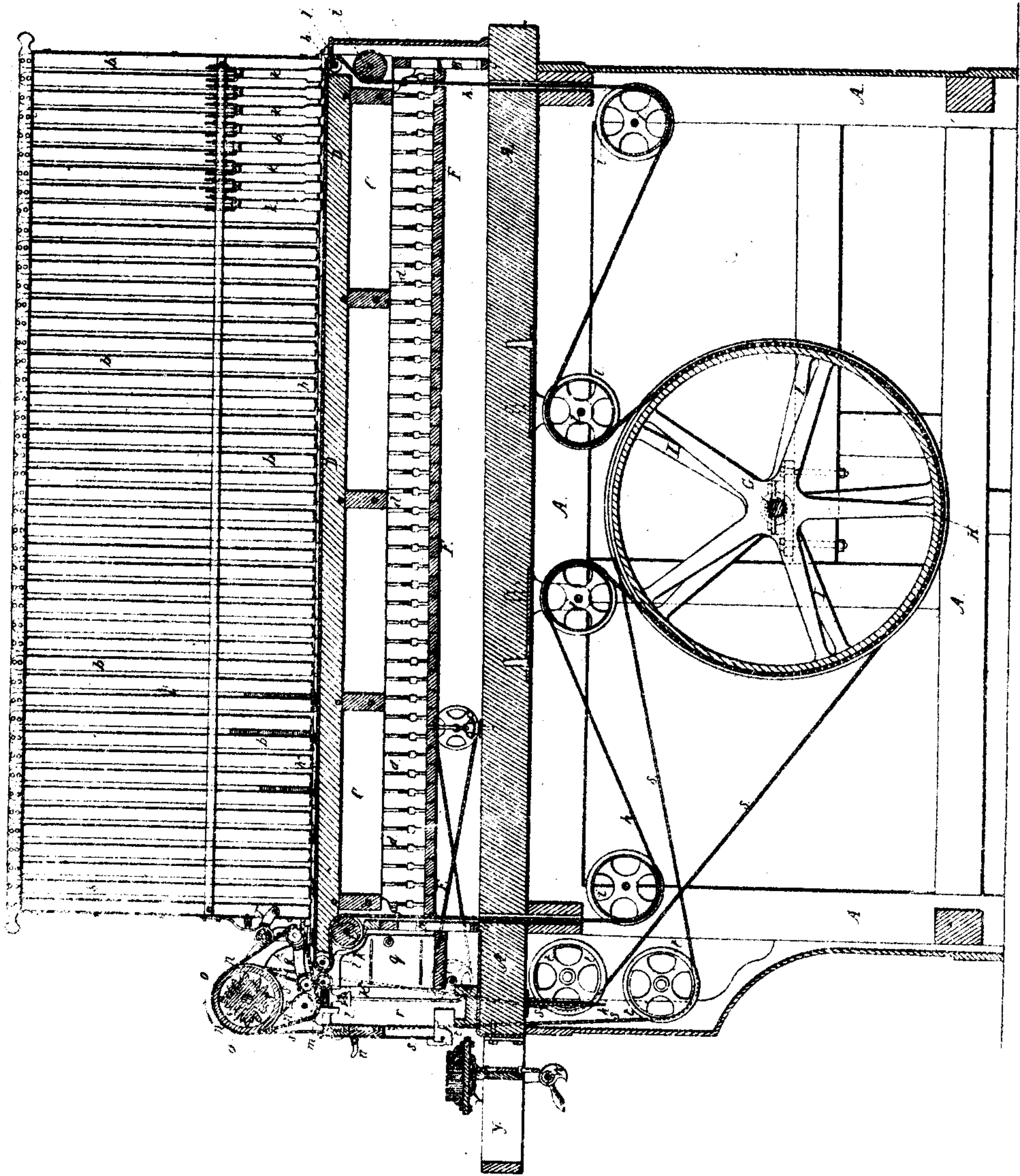
PATENTED SEPT. 9, 1843.

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MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS—SHEET 8.

Fig. 13. Vertical long section on line A B of Fig. 12.
Scale quarter of an inch to an inch.



Witnesses
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MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS—SHEET 8.

Figs. 23

Modifications of m. Fig. 22.

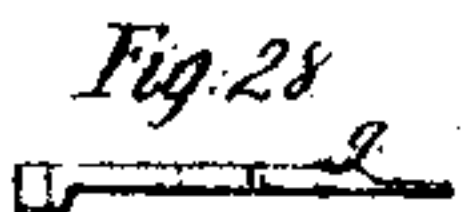
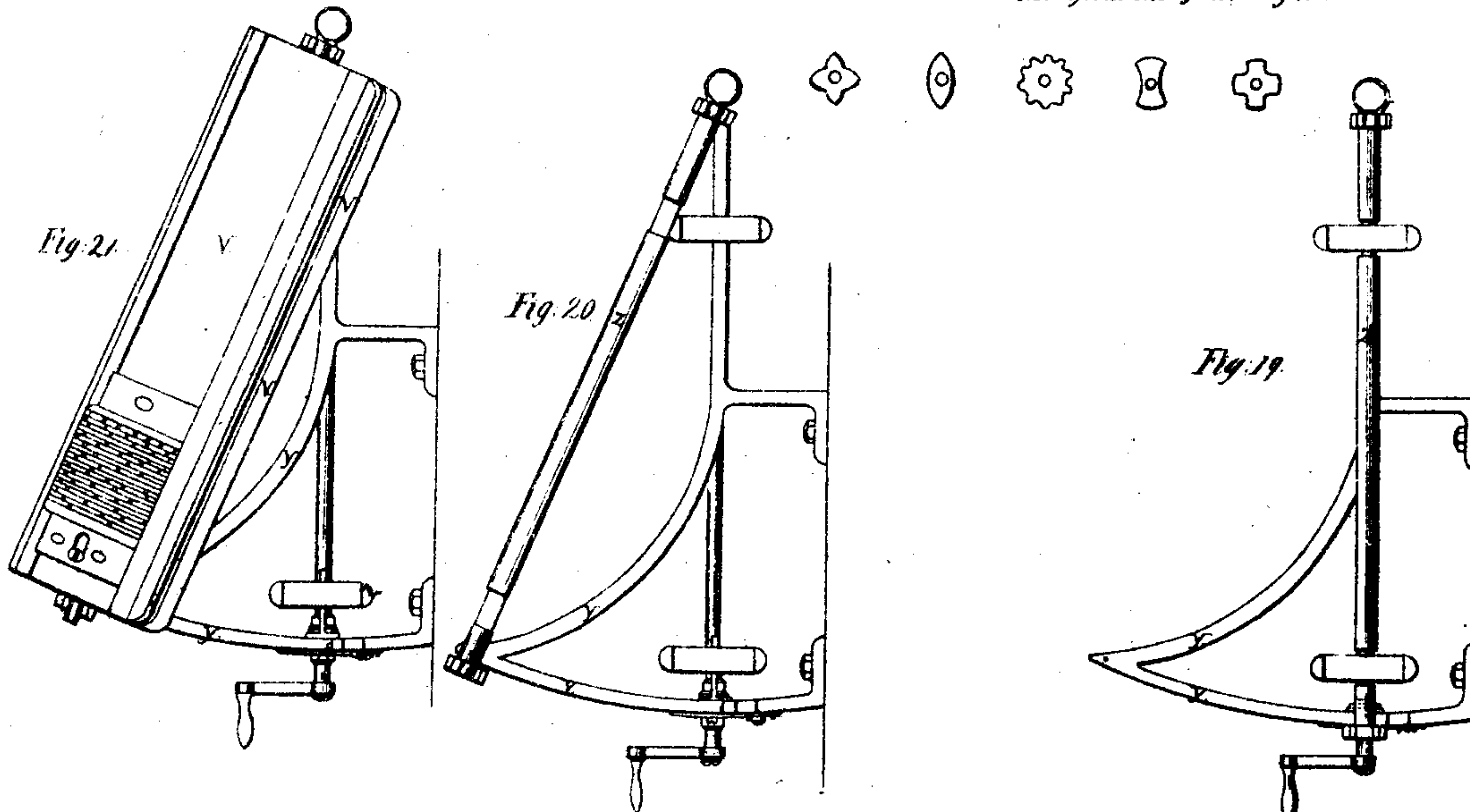


Fig. 22
Modification.

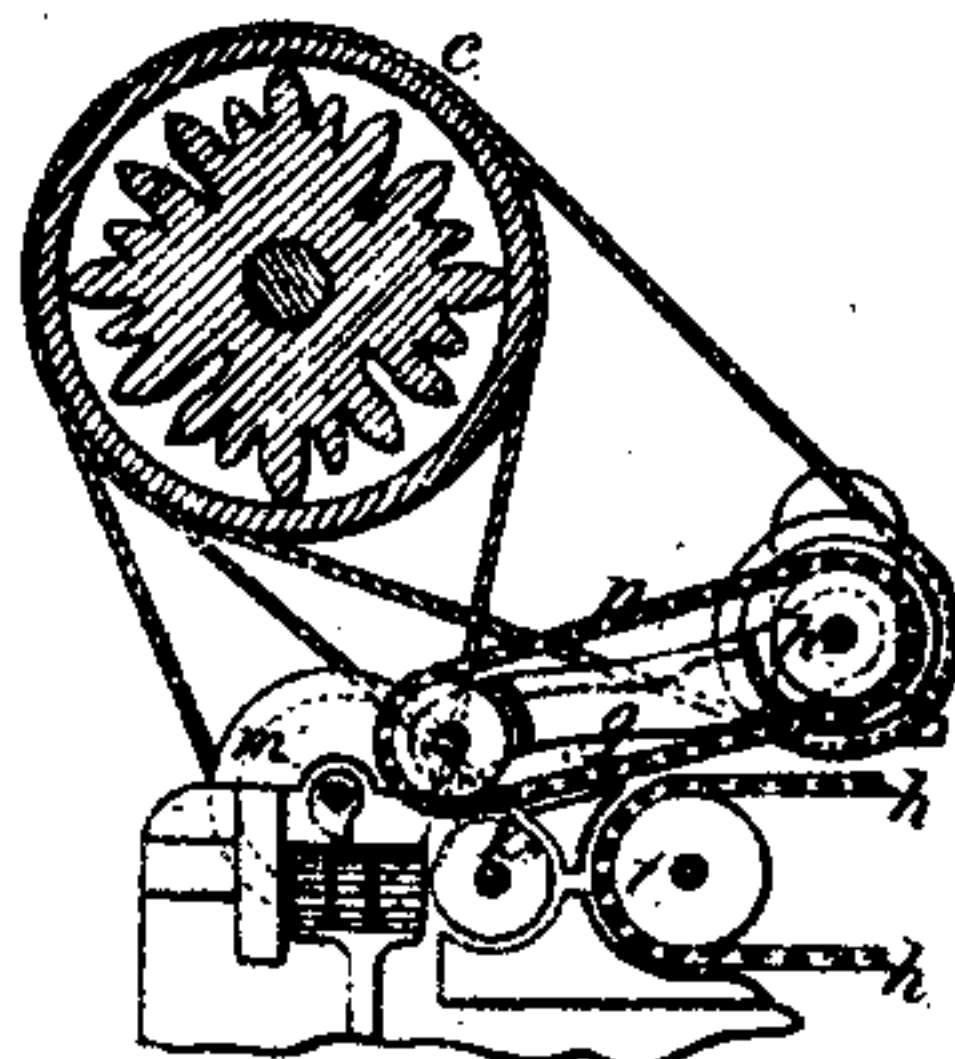
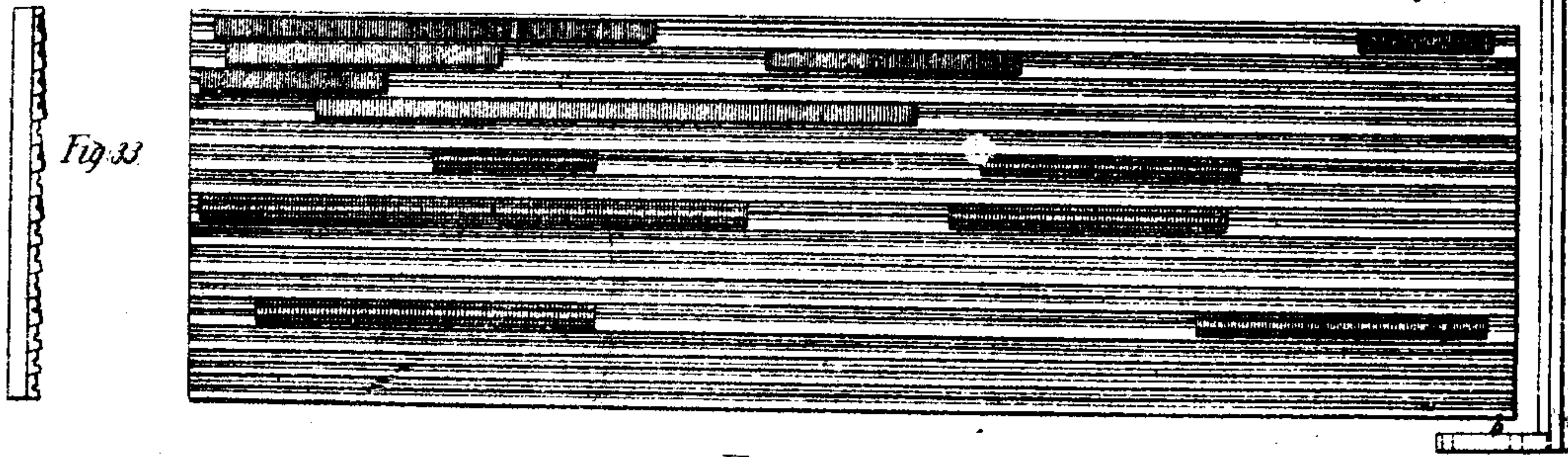
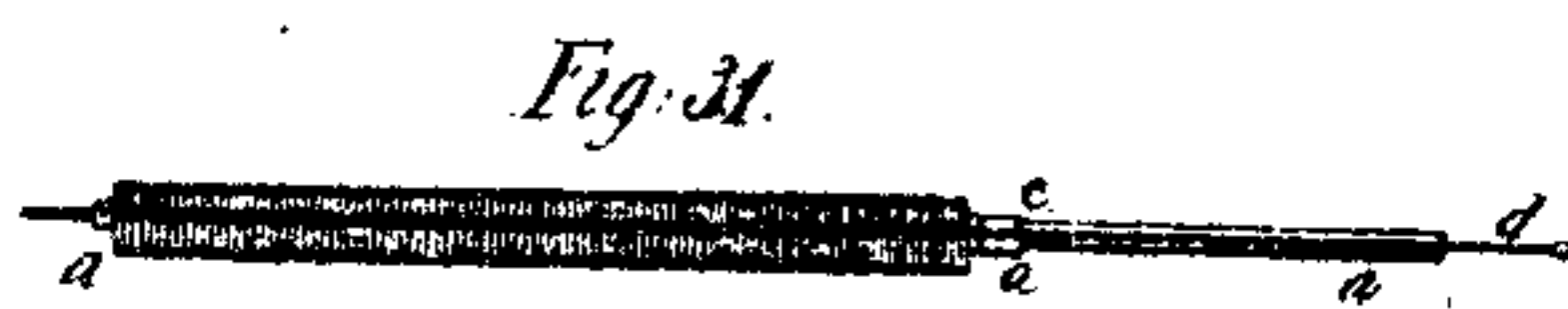
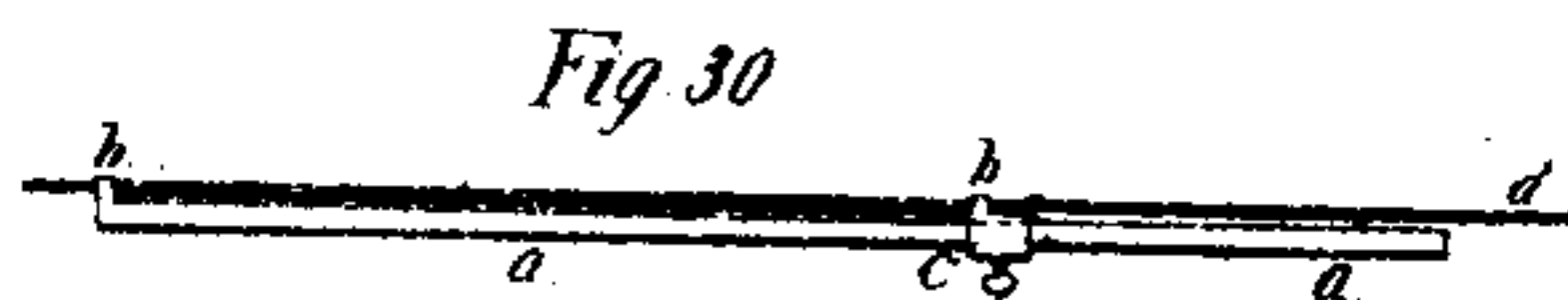


Fig. 25
Type channels
or grooves.



Witnesses
Wm. H. Fish
Frederick L. Deane



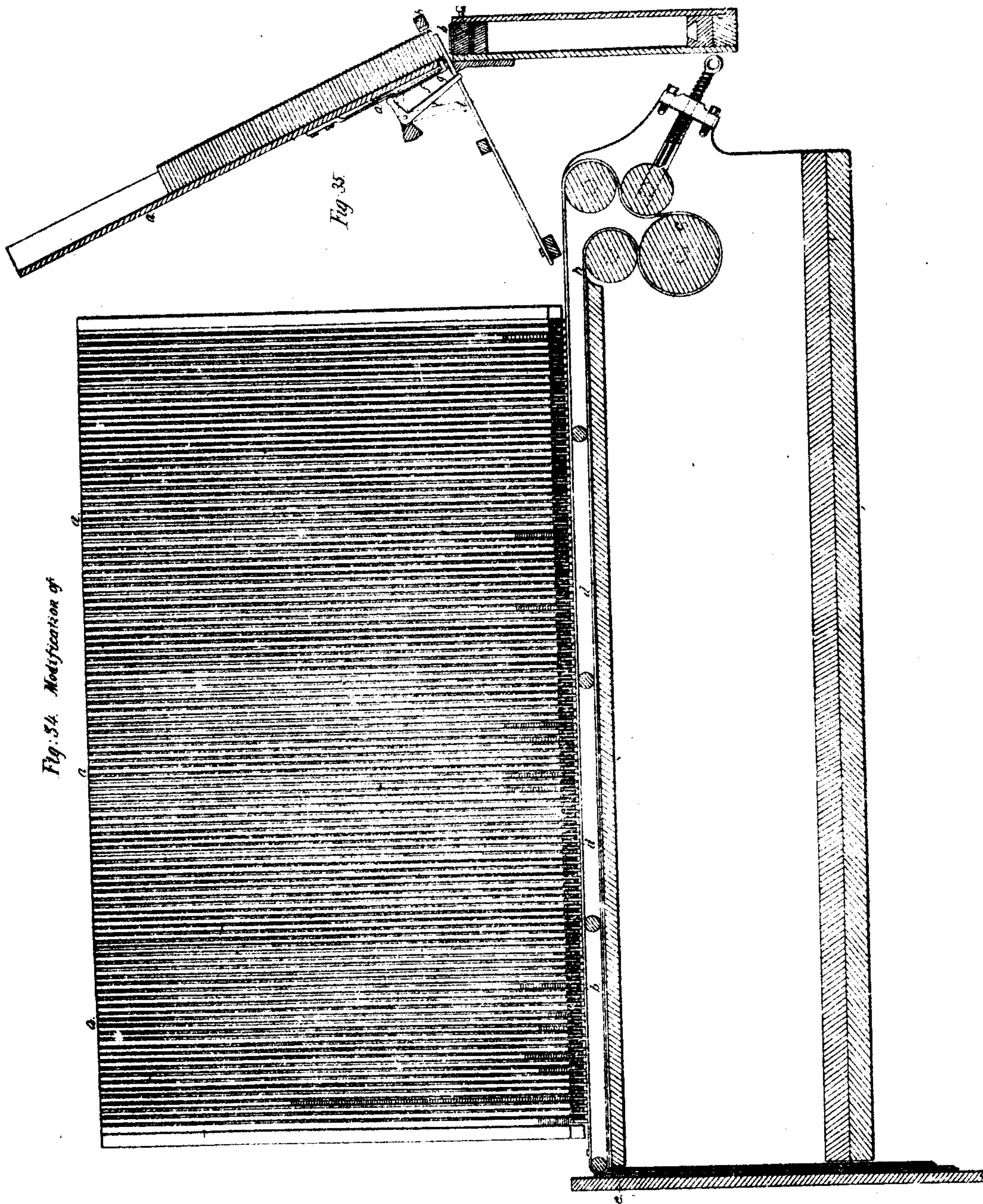
Inventor
F. Rosenberg

No. 3,257.

PATENTED SEPT. 9, 1843.

F. ROSENBORG.
MACHINE FOR DISTRIBUTING AND SETTING TYPE.

9 SHEETS-SHEET 9



Witnesses.
W. Muffatt
Edw. Wallgren

Inventor.
F. Rosenberg

UNITED STATES PATENT OFFICE.

FREDERICK ROSENBORG, OF KINGSTON-UPON-HULL, GREAT BRITAIN.

MACHINE FOR DISTRIBUTING AND SETTING UP TYPE.

Specification of Letters Patent No. 3,257, dated September 9, 1843.

To all whom it may concern:

Be it known that I, FREDERICK ROSENBORG, a subject of the King of Sweden, and now residing in the borough of Kingston-upon-Hull, in the Kingdom of Great Britain, gentleman, have invented or discovered a new and useful invention of Improvements in Arranging and Setting up Types for Printing; and I do hereby declare that the following is a full and exact description thereof.

My improvements in arranging and setting up types for printing consist in the construction and employment of peculiar combinations of mechanism hereafter explained, the first of which is for arranging the types, that is, performing that operation commonly called "distributing" them in a peculiar manner so that they are arranged for the second operation the several letters of any "composition" after they have been used for printing are separated and arranged according to their several characters in distinct columns, ready for insertion into the second or composing or setting up combination of mechanism or machine, which second machine is also peculiarly constructed as will be hereinafter explained constitutes my second improvement and by means of these improvements the several types are first arranged and then selected and brought into lines forming words and sentences.

In the accompanying drawings Figure 1 represents a side elevation of the arranging or distributing machine, Fig. 2 an end elevation of the same, and Fig. 3 a partial horizontal view as seen from above. A A A are the standards and framework supporting the mechanism. B is the main horizontal rotary shaft carrying a pulley C from whence (passing over guide pulleys D D) an endless band is conducted up to a pulley E upon the end of another horizontal shaft E F in front of the machine and by means of which endless band that shaft is made to revolve. Rotary motion may be given to the main shaft B by a winch or other means and there is a fly wheel G fixed upon the main shaft for regulating the motions. Fig. 4 is a horizontal representation of a portion of the top of the machine as shown in Fig. 3, but drawn upon an enlarged scale (that is full size) exhibiting the principal working parts. Fig. 5 is a view of part of the front of the machine as at Fig. 2, but also drawn

full size. Fig. 6 represents in vertical section a portion of the machine near the pulley E in Fig. 1 likewise drawn full size, and Fig. 7 is an elevation of the back part of what I denominate the sliding frame seen extending horizontally upon the top of the machine at H H H in Figs. 1, 2, 4 and 5.

In order to arrange or distribute, that is, select the types and place all those of one letter or character in a distinct column or row in its own particular groove of the horizontal plate shown at I I I in Figs. 3 and 4 I bring a page or other convenient quantity of the types or matter from the printing press in a galley and place that galley in the machine as at K in Figs. 2 and 3. This galley is supported by a bracket L at the left hand side of the machine and is made fast thereto by a pin passed through an ear fixed to the under part of the galley. A small sliding piece or block *a* is brought up by hand against the end of the page of types for the purpose of keeping the types together and forcing them forward. At the front end of the galley there is affixed an upright piece *b* in which a sliding plate *c* works vertically; the under edge of this sliding plate is covered with leather or some other soft substance to prevent it from injuring the types. The end of the galley is shown in the two detached Figs. 8 and 9, with a portion of the apparatus called the sliding frame H beneath, Fig. 8 being a front view of the upright *b* and Fig. 9 a longitudinal section of the same. a portion of the page of types to be distributed is represented at *d* in Fig. 9 and in Figs. 2 and 3. These types stand in lines as when in use on the table of the printing press they are to be slid forward in the galley by pushing up the block *a* in order to bring the lines of types in succession over a long slot or opening *e* (see Fig. 9) which opening is cut across the bottom of the galley at its end at which time the slider *c* must be raised as in Figs. 8 and 9. The slider *c* being then depressed the front line of types will be forced down through the opening *e* out of the galley and into the groove of the sliding frame H placed beneath to receive them. Here the types are held and constantly pressed forward along the groove in the frame H by a small sliding pusher *f*. This pusher *f* is by a pin connected to an endless chain *g* attached to the periphery of a pulley M the

axle of which pulley is made fast to the inner end of a convolute spring contained in the box N affixed to the side of the sliding frame H. Hence it will be perceived that
 5 by the power of the spring continually acting the chain *g* will be made to carry the pusher *f* forward and to force the types up against a stop plate *h* at the end of the groove of the sliding frame H. The first
 10 type in the line will thus be brought immediately over one of the apertures *i*, *i*, *i*. Figs. 3 and 4 formed by vertical grooves in the face of a horizontal plate P P P fixed upon standards *k* and extending across the
 15 machine transversely over the front part of the grooved plate I. This plate P has two rebated ledges *l*, *l*, forming a groove in which the carriage *m*, *m*, of the frame H containing the line of types may be slid
 20 to and fro across the machine. For the convenience of moving this sliding frame H on the plate P a handle Q is affixed to the carriage by which the workman shifts laterally the position of the sliding frame for the
 25 purpose of bringing the front type of the line held in the groove over any one of the apertures *i* as may be required. The form of these vertical grooves *i*, *i*, *i*, are partially seen exposed to view in the perpendicular
 30 face or front of the plate P at Fig. 5. They are made wide at top to admit the type freely but contracted toward the lower part to nearly the size of the type in order to conduct it accurately to the bottom of the
 35 groove and these grooves are severally cut to different depths according to the thickness of the bodies of the respective types intended to be slid down them. The grooves *i* are covered except at their lower
 40 parts by a face plate *n*, *n*, as shown in Figs. 2 and 5. The shaft F is mounted in brackets affixed to the vertical part or front edge of the plate I and carries a series of cams or eccentrics *p* *p* *p* best seen in Figs. 5 and 6
 45 a different construction of which is shown at Fig. 6* each of these cams works in the lower or open part of one of the vertical grooves *i*, *i*, *i*, for the purpose of pushing back any type that may have passed down
 50 its groove and for forcing the type into the horizontal groove of the plate I which will be best seen in Fig. 4 and in the detached section Fig. 6.

In front of the machine a semicylindrical
 55 bar R R is affixed which carries the axle of a series of bent levers or keys *q*, *q*, *q*, each of which keys has reference to a certain letter or type as marked thereon in Figs. 3 and 4 and a rack or notches cut in the said bar
 60 forms the guides in which these levers or keys work. On the side near the end of the carriage *m* of the sliding frame a piece *r*, is affixed having a perpendicular descending arm and to the front end of this piece
 65 against the descending arm is appended a

bent lever *s* hanging upon a fulcrum pin inserted therein as seen best in Fig. 5*. To the upper end of this bent lever a rod *t*, is attached to a joint and the reverse end of this rod *t* is connected in a similar way to a horizontal slider *u* acting at the back of the stop
 70 plate *h*, as seen in Fig. 4. A little in advance of the piece *r*, there is also affixed to the carriage *m*, a stud upon which is mounted a bent lever *v*. The end of this lever *v*, as the carriage *m*, *m*, slides to and fro in the groove of the plate P, P, works upon the
 75 upper edge of an indented rib *w*, *w*, extended along the plate. This rib *w*, is formed on its upper edge with certain elevations corresponding in height to the thickness of the bodies of the respective types to which such elevations relate and the end of the said lever *v*, acts upward against the tail of a
 80 crank lever *x*, mounted upon a stud fixed in the side of the carriage *m*, as seen in Figs. 4 and 7. The vertical arm of this crank lever *x*, is connected by a joint pin to a rod *y*, which rod at its reverse end is in like manner attached to a slider *z*, as seen in Figs.
 85 4 and 7. 90

Let it now be supposed that a line of types has been forced down from the end of the galley K by the depression of the slider *a* as described above and that the said line of types
 95 is situate in the groove of the sliding frame H as shown in Fig. 4, the workman reads the line of types so situate and finding the first type of the line to be the letter (*h*) he applies a finger of his left hand under the
 100 lever or key marked (*h*) and lifts that key as shown in Fig. 4 by doing which the upper part of the lever comes against the face plate *n* and forms a stop to the sliding
 105 frame H. The right hand of the workman having hold of the handle now slides the carriage and frame H toward the left until the vertical part of the piece *r* strikes against the side of the projected key *h* by which the progress of the frame H is arrested.
 110 The same movement brings also against the stop the lower end of the pendant lever *s* and thereby causes it to move the slider *u* forward and to push the first type of the line sideways out of the groove in
 115 the frame H into a small recess formed opposite to the end of the slider *u*. But before this type can be so detached from the groove of the frame the recess must be formed to receive it and this is done by the
 120 end of the lever *v* having passed onto an elevation of the rib *w* which has raised it and thereby lifted the crank lever *x* and drawn back the slider *z* to such a distance as shall leave a sufficient recess for the body of the
 125 type to be passed into the capacity of this recess depending upon the height of that part of the rib *w* which is here acting upon the lever *v* and this is so formed as to correspond in its height to the thickness of the
 130

particular type or letter to which it belongs. The type thus brought into the situation described now slides down the vertical groove *i* in the face of the plate *P* and is conducted in an erect position to the bottom of the groove as described and shown in Fig. 5. While this is going on the shaft *F* is kept constantly revolving by the means before explained and the cam or eccentric *p* coming around forces the type back from the vertical groove *i* into the horizontal groove of the plate *I*. Supposing the next letter of the line of types to be (*o*) the workman having slid back the carriage and frame *H* toward the right now lifts the key (*o*) and brings the piece *r* as before up to the stop when the type is in the same way delivered into one of the vertical grooves *i* and then by its rotary cam pushed back into its horizontal groove in the plate *I*. By these means all the types of the line are in succession brought up and stopped by the key answering to its letter or character and thus the letters of the same character are successively distributed and introduced into their own proper groove in the horizontal plate and by that means are "arranged" in columns ready to be placed in the composing machine and to be operated upon in the manner about to be explained.

It is only necessary further to say that on inserting every fresh line of types into the groove of the sliding frame *H* the pusher must be brought back which will wind the convolute spring in the box up to tension and thereby the spring will possess the power of turning the pulley and working the chain so as to force the pusher forward and keep the types up against the stop plate *h* as long as any remain in the groove of the slide.

The machine for composing, that is setting up types in the order of words lines and pages, is shown in the followings figures of the drawings. Fig. 10 is a front elevation of the machine complete and in working order. Fig. 11 is an elevation of the same as it would appear if viewed at the left hand end of the machine. Fig. 12 is a horizontal view of the same as seen from above, a portion of the cover being removed for the purpose of exposing parts of the works beneath. Fig. 13 is a vertical section taken longitudinally through about the middle of the machine on the dotted line *A, B* of Fig. 12 parallel to the front; and Fig. 14 is a vertical section taken transversely on the line *C, D* of the same figure.

The framework of the machine is represented at *A A A* upon which are fixed two horizontal standards *B B* and upon these are mounted two parallel longitudinal plates *C C* placed edgewise with their upright framings carrying a horizontal longitudinal bar *D* having a groove along the

middle of its upper surface in which groove the types are slid when the machinery is in operation. On the upper edges of this bar *D* two flat longitudinal plates *a, a* are affixed which carry the two upright rack frames *b, b* that contain the types intended to be operated upon. These types are arranged in vertical columns each compartment of the rack being respectively filled with a column of types of a certain letter or character the columns of types descending by their own gravity as the single types are severally driven out of the column at its lower end by the operations of the machinery about to be explained.

The rack frames *b, b* are formed by a series of upright grooved rails seen detached on an enlarged scale in Figs. 24, 25 and 26. Fig. 24 is a view of the top of one of these grooved rails. Fig. 25 is a side view; and Fig. 26 is a view of the bottom end. Upon referring to Fig. 13 it will be seen that a space about the thickness and length of the type in each column is cut away at the bottom of the grooves formed by the rails *b b* in order to allow the types to be pushed out onto the endless belt or chain. The height of these spaces in the grooves must correspond with the thickness of each type so that not more than one type may be pushed out of the column at one time. When a number of these rails are ranged together side by side so as to form the rack frame shown in Fig. 13 a number of compartments are formed in width rather more than the length of a type so that when a column of type is placed in one of these compartments the types descend as above mentioned by their own gravity. Two series of keys *E E E* and *F F F* are arranged horizontally in front of the machine as seen in Figs. 10 and 12. These keys severally hang as levers upon fulcrum rods *e, e* extending along the machine as shown in Fig. 14 and the inner extremities of these keys are severally connected by upright rods *d, d* to one of the small *T* formed levers *e* hanging upon fulcrum rods in brackets *f* affixed to the longitudinal plates *C, C*. The upper end of the cross of each *T*-formed lever *e* acts through a slot in a horizontal sliding pusher *g*. These pushers which are shown on a half sized scale at Figs. 27 and 28 move transversely to and from the several columns of types upon the plates *a a*. It will hence be perceived that on the compositor striking one of the keys with his finger, the depression of the front part of the key will cause the rod *d* at its reverse end to rise and to vibrate the small lever *e* thereby forcing inward the upper end of its cross and consequently sliding the pusher *g* against the lowest type in the column corresponding to that key. The type thus acted upon will by these means be pushed out of

its column in the rack into the longitudinal groove cut in the bar D where it is to be slidder along into the receiver where the types are formed into lines by the following means.

5 An axle G mounted in the lower part of the framework seen in Figs. 13 and 14 carries two pulleys H and I and also a fly wheel J. Over the pulley H an endless belt or chain h' , h , h is passed, and also over a series of carrier pulleys i , i , i , i , i , i , i , i . This belt or chain as the pulleys revolve is made to travel horizontally along the lower part of the groove in the longitudinal bar D, and hence whenever a type is projected as above described from one of the columns into this groove it necessarily falls upon the upper surface of the band or chain and is by the longitudinal progress of the band or chain carried onward to the receiver at the left end of the machine. It will be perceived that there are two series of keys E and F, and also two series of T-formed levers e , e the one series in front of the bar D the other series at the back of the bar and that there are likewise two series of columns of types arranged in the double rack frame b , b consequently by striking the keys E, the front series of levers e and the types of the front columns will be projected into the groove of the longitudinal bar D, and by striking the keys F the back series of levers e and the types of the back columns will be acted upon in a like manner. In the middle of the double rack frame between the front and back columns of type, there are loosely pendant a series of thin strips of tin k , k , k see Figs. 13 and 14, the lower extremities of which extend into the groove of the bar D a little above the upper surface of the belt or chain h . These pendant strips are for the purpose of stops preventing the types being pushed beyond the groove; and there are small pins extending from across the groove on a level with the plates a , a to support one end of each of the types when so projected and prevent its turning over the other ends of the types falling onto the traveling chain or belt h by the progress of which they are drawn off the pins and conducted onward toward the receiver in the proper positions for depositing them correctly in line with the face of each type in the same direction.

55 The several types for forming words and for forming the spaces between the words having thus been successively brought out from the columns of the racks by the means described and deposited upon the traveling endless belt or chain h , h they are conducted onward by the progress of the belt or chain to the carrier pulley i^* and over a transverse triangular guide bar or bridge onto a roller k^* seen near the left hand end of Fig. 13 by which last mentioned roller the

type is deposited upon the top of a T-formed vertical slider l and as the several types in succession come into this situation they are piled one upon another forming a line of types, the slider l receding as the types accumulate thereon. In order that the successive types may thus be accurately deposited upon the top of the slider l a roller m mounted in a bracket is placed over the slider to act as a presser roller. A small endless chain n , n , n also assists this operation which is distended over the roller m and over the pulleys o and p . On the axle of the pulley p a spring lever q hangs loosely carrying a roller at its end which presses the chain down upon the roller k^* and also another spring lever r carrying a roller by its pressure keeps the endless chain n always tightly distended. Rotary motion is given to the endless chain n by an endless band s , s , s , s passed over the pulley o and over carrier pulleys t , t which band is actuated by the pulley I upon the main axle G and the roller k^* receives a simultaneous rotary motion by a small endless band from a pulley u on the same shaft as that of o represented in Figs. 11 and 12.

Another arrangement of this part of the machine is shown on an enlarged scale in the detached Fig. 22 in which the endless chain n , n instead of passing around the pulleys m , o and p as seen in Fig. 13 merely passes around the two pulleys p and p^* . The types are brought onto the T-shaped slider l by the endless chain h in the same manner as that described in reference to Fig. 13 but instead of being forced down to their proper position on the slider l by means of the chain n passing around the pulley m a small snail or wiper m^* is used; this wiper is mounted on the axle of a band pulley and receives a rapid rotary motion from the pulley o by means of a band and thereby forces the line down as each type is brought forward and piled on the slider l by the endless chain h and n . The endless chain n is also actuated by a band from the pulley o passing around a pulley on the axle of p .

Fig. 23 represents various forms of rotary wipers which may be used instead of the snail m^* in Fig. 22.

Thus it will be perceived that as the types are brought onward by the traveling belt or chain h they are successively deposited or piled one upon another on the top of the slider l and that the slider by the accumulation of the types pressed upon by the chain n and roller m or by the cam m^* in Fig. 22 is gradually depressed until a sufficient number of types have been built up upon the slider to form a line of the composition and it is necessary here to observe that a face plate must be placed against the slider l to prevent the line of types dropping out as the composition goes on which

plate is shown at *x* in the front elevation Fig. 10. For the more perfect illustration of this part of the mechanism I would refer to the enlarged Figs. 15, 16, 17 and 18 which represent the receiver detached from the machine in several positions. Figs. 15 and 16 exhibit the receiver and its appendages as seen in Figs. 10 and 13. Fig. 17 is an end or edge view of the same and Fig. 18 a back view.

In order to ascertain when a sufficient number of types have been accumulated upon the slider *l* to form one line of a page of composition a counting or measuring apparatus is attached as shown in the several Figs. 10 to 14. This apparatus consists of a dial plate *a* seen in front of the machine in Fig. 10 (immediately under the rest frame *L* on which the compositor places his copy). Through the center of this dial plate an inclined shaft *b* passes to the back of the machine as seen in Fig. 14. At the hinder part of this shaft there is a pulley *c* carrying an endless chain (shown in Fig. 13) which chain passes around another pulley *d* seen in Fig. 12 fixed upon a transverse shaft *e*. Upon this shaft *e* there is also a similar pulley *f* situate at the back of the receiver (seen best in the detached Fig. 18). To this pulley is affixed the end of a chain *g* the reverse end of which chain is appended to the lower end of a vertical sliding rod *h* constituting the back guide of the T-formed slider *l* on which the line of types are built up as described in reference to Fig. 13 and upon the shaft *e* is also affixed a pulley *i* having a weighted friction band passed over its periphery to retard partially the descent of the slider. The face of the dial *a* is graduated with a scale representing inches and parts of an inch in order to show by the rotation of the index how far the slider has descended when the apparatus is at work and consequently the length of the line of types accumulated on the top of the slider *l* an adjustable index is likewise placed upon the face of the dial as a mark for the workman to regulate the length of each line. A ratchet wheel *k* with an adjustable click or catch (see Figs. 10, 11 and 12) is placed upon the axle *e* for the purpose of acting upon a hammer to strike a small bell *k** as a warning a little time before each line of types is completed upon the slider. Thus one line of types having been built up upon the top of the slider *l* as indicated by the coincidence of the hands upon the dial plate the compositor turns the winch *l* on the shaft *e* for the purpose of lowering the line of types to the bottom of the receiver. In order to transfer this line of types into the adjusting stick after they have been thus lowered the compositor moves a horizontal

lever *m* seen under the keys in Figs. 10, 11 and 14. This lever is connected by a rod *n* with an arm *p* attached to the slider *q* which is a flat plate movable longitudinally on the face of the receiver as shown in Figs. 10, 13, 15 and 16. The receiver is constructed of a flat upright plate *r*, *r* against which the T-formed slider *l* works up and down vertically and in front of it is attached the face plate *s* before mentioned leaving a narrow space between them for the sliders and line of types to pass as shown in Fig. 17. At the end of the receiver *r* is attached by a joint the adjusting stick *s* which is a box formed by two parallel plates turning up and down upon a pin *t* as shown in Figs. 10, 13, 15, 16, 17, and 18. The adjusting stick *s* being placed upright at the end of the receiver *r* as in Figs. 10, 13 and 16 and held fast in that situation by a catch *u* the slider *q* is moved laterally by the lever *p* as before said which forces the line of types out of the receiver into the adjusting stick. The T formed slider *l* may be now raised again to the top of the receiver by turning the winch *l* when it is situate ready for a fresh line of types to be built upon it by the means before explained. The adjusting stick *s* is now to be turned down into the horizontal position shown at Figs. 15 and 18 where an assistant compositor corrects any errors that may be necessary and having done this he raises the galley *v* to the under part of the adjusting stick *s* by turning a handle with an eccentric *w* into the situation shown at Fig. 15 and then draws horizontally a slider *x* by which the types are allowed to descend into the galley as shown in Fig. 18. The galley is mounted upon a horn shaped frame *y* fixed at the end of the machine and is suspended by pivots upon a sliding frame *z* which turns horizontally upon the horn frame by means of a pin joint at its end. These parts are best shown upon an enlarged scale at Figs. 19, 20 and 21, the galley being occasionally drawn aside by the assistant compositor is to be slightly inclined as at Fig. 21 for the purpose of having the lines of type spread out to the required breadth of the page and leads introduced between the lines when required.

Fig. 29 represents a portion of a horizontal view as Fig. 12 in which a slight variation is exhibited. In this instance the endless belt or chain *h* which conducts the types to the receiver is made much broader, that is sufficiently so to receive two types abreast or side by side and a longitudinal bar as a partition between the two types extends along the machine and operates as a stop when the types are severally projected from the racks instead of the pendant strips of tin shown at *k*, *k*, *k*, in Fig. 13.

Figs. 30 and 31 represent in two views an instrument which I denominate a feeding

stick, by means of which a column of types may be lifted from a groove of the distributing machine and inserted in the proper compartment of the rack of the composing machine. In these figures *a a* is a straight rectangular bar having a lip or flange *b* at one end and a slider or clip *c* with a similar lip movable upon the bar *a* which slider is (when the "feeding stick" has been charged with types) made fast upon the bar by a thumb screw and a straight rod *d* is passed through holes in both the clips *b* and *c* which rod must be withdrawn when a column of types is to be taken from one of the grooves of the distributing machine. In taking up a column of types by this apparatus the bar *a* is laid close alongside of the type standing in the groove of the distributing machine, the lip *b* being in contact with one end of the column, then the slider *c* is pressed up to the reverse end of the column and made fast there by a thumb screw. The column of types is thereby clipped tight at its ends and the rod *d* is then introduced to prevent the type falling out. The feeding stick with the types thus held may then be carried to the composing apparatus and slid down one of the perpendicular compartments of the rack when on withdrawing the rod *d* and unscrewing the clip the apparatus may be withdrawn leaving the column of types inserted in the rack ready for use.

When there are a surplus quantity of arranged types more than will fill the grooves of the distributing machine and the columns of the composing rack then I place such surplus of arranged types upon a table shown in horizontal view at Fig. 32 and in the end view Fig. 33 the face of the table is formed with longitudinal ribs slightly inclined to render the faces of the types visible and a groove is cut along the middle of each rib in order to allow the clips of the feeding stick to be introduced when a portion of types from one of these columns is required to be taken up.

Figs. 34 and 35 represent the modification of the above in these figures the types are arranged in the grooves of a rack frame placed in an inclined position in such a manner above the endless band that they may fall by their own gravity onto the said endless band when permitted by the mechanism so to do and be thereby conveyed to the receiver. Fig. 34 represents a front view and Fig. 35 a transverse vertical section of this modification *a, a*. The rack frame in which the types are arranged—*b, b* the endless band which passes over or around several rollers and receives motion from the roller *c* as the endless band travels on the types are delivered onto its upper surface in the following manner: A series of sliding

rods *d* Fig. 35 are connected to the keys of the machine by any simple leverage and the ends of these sliding rods severally stand under and support the respective columns of types as seen in the figure so that the types bear upon them. When any one of these rods is slid back by the action of the key the lowest type in the column falls down upon the endless belt or chain *b* and is carried to the receiver into which it is depressed by a snail or cam in a similar manner to that described in reference to the former figures. As only one type must be allowed to fall when a key is depressed a spring *f* placed behind the plate answering to every column of types is brought into action to retain the next lowest type in its position by which means all the types above it are necessarily held up. At the lower end of the spring *f* is a tooth or projecting part *g* which is inserted in an opening at the lower part of the rack opposite to the end of the type and at the other end of the type there is a bar *h* extending longitudinally across the machine. The face of this bar *h* next the end of the type must be padded with leather to form a soft resistance. When the sliding rod *d* is drawn back by the key it acts upon and draws back one end of a crank lever *i* which projects through an eye in the rod *d* and when one end of this lever is drawn back by this means the other end is pressed against the spring *f* as shown by dots in the figure. This spring is thereby made to force the tooth *g* firmly against the end of the type and hold it fast against the bar *h*. As soon as the pressure is taken off the key the rod *d* projects forward again into its place and supports the column of types as shown in Fig. 35, the upper end of the crank lever *i* having allowed the spring *f* to assume its inactive position.

Having now described my invention and the manner in which the same is carried into effect it is scarcely necessary to point out to any one skilled in mechanics that the form and construction of the machines, admits of considerable variation and many of the operations may be performed by other equivalent mechanical devices. I do not claim as new such parts of the composing machine as have been already described under a former patent obtained by me in England and bearing date the 27th day of November 1840, but

I claim—

1. The peculiar arrangement of mechanism or combination of parts herein described, and constituting a machine for performing the operation called "distributing" the types which we call "arranging" substantially as represented in Figs. 1 to 9 inclusive.

2. I claim the use in the manner set forth,

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of the grooved plates I, I, I, in which the types are arranged in rows or columns—this plate although shown in a horizontal position in the drawings—may be placed in an inclined or perpendicular position.

3. I claim the method shown in Figs. 8 and 9 of lowering the types line by line from the galley into the traveling carriage.

4. I claim the use of a traveling or sliding carriage constructed and combined as above set forth, by means of which each type is consecutively brought over the proper opening through which it descends in its groove in the grooved plate.

5. I claim the use of the inverted rib *w* in combination with those parts of the sliding carriage which form a recess of the proper width to suit the thickness of the type and into which the type is pushed as hereinbefore described and shown in the drawings.

6. I claim the manner of arranging and combining the bent levers or keys *q* whereby the sliding carriage is stopped over the proper aperture through which the type is to descend and which keys at the same time act upon the pusher of the carriage and thereby force the last type out of the line into the recess which is formed of the proper width by the indented rib *w* already mentioned acting upon a spring lever connected to the sliding carriage and which regulates the width of the recess.

7. I claim the method herein described and shown of forcing the types along the grooves of the ground plate by means of the shaft *F* and a series of cams or eccentrics as at *p* whether those cams are used by themselves or in conjunction with levers or pushers for this purpose.

8. I claim the arranging of the types in vertical columns in a rack frame constructed as set forth on one or both sides of a groove passage or way into or onto which groove passage or way the several types are (as they are required) pushed out by any convenient mechanical arrangement from the vertical columns in which they are arranged and then conveyed to the receiver either by means of an endless band or chain as above described or by any other contrivance substantially the same in its construction and operation.

9. I claim the employment, in combination with the lever and tube as described, of an endless band or chain onto which the types are deposited to be conveyed to the receiver whether the said band or chain, lever and tube are used in combination with the other mechanical arrangements above

described or with any other in which it is employed for a like purpose.

10. I claim the manner described of pushing out one single type from any column in the rack frame by means of pushers which are acted upon by levers in connection with the keys so that when any key is depressed it may by any mechanical contrivance push forward the corresponding pusher and thereby force out the type from the column onto the endless band which runs in a longitudinal groove at the back of the column of type by which means the type is conveyed to one end of the machine where it is deposited in the receiver in the manner described.

11. I claim the peculiar construction and arrangement of the parts immediately connected with the receiver into which the types are severally brought by the endless belt, these parts consisting of the carrier pulley *z*, the roller *z**, with their appendages and the T formed slider *l* upon which the types are built up in lines and the mechanism connected with the said slider.

12. I claim the within described manner of forcing or pushing the types down in the line formed on the slider *l* after they are brought to the receiver by the endless belt or chain I claim this whether it is effected by means of the small endless chain or belt *n n* in conjunction with the pulley *m* around which the chain passes as seen in Fig. 13 or by means of a snail cam or other eccentric shown in Figs. 22 and 23 and whether the said cam or eccentric acts itself directly on the type or through the medium of a lever or pusher.

13. I claim the construction and arrangement of the justifying stick and also the mode of removing the line out of the receiver into the same by means of which justifying stick the line is lowered into the galley. I also claim the manner in which the said galley is fixed in the machine as shown in Figs. 19, 20, and 21.

14. I claim that part of the machine called the counting apparatus as annexed to and combined with the setting up machine, whereby the compositor is enabled to ascertain how far the line in the receiver has approached toward completion.

In witness whereof I, the said FREDERICK ROSENBERG, have hereunto set my hand this first day of November 1842.

FR. ROSENBERG.

Witnesses:

J. W. MOFFATT,
FRED WALKER.