

G. SEBOLD.

MACHINE FOR PLACING FRICTION MATCHES IN FRAMES FOR DIPPING.

No. 78,837.

Patented June 9, 1868.

Fig. 1

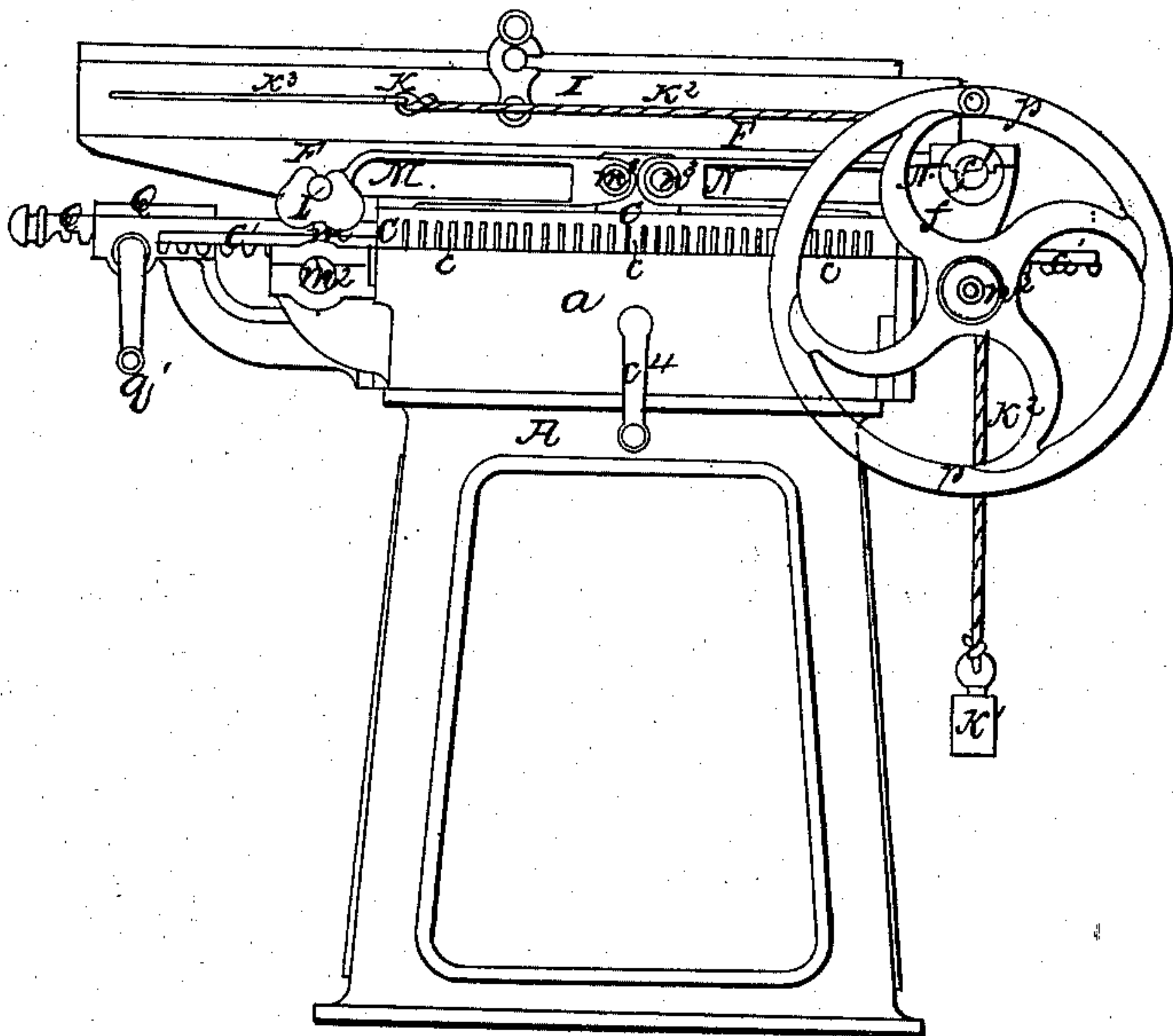
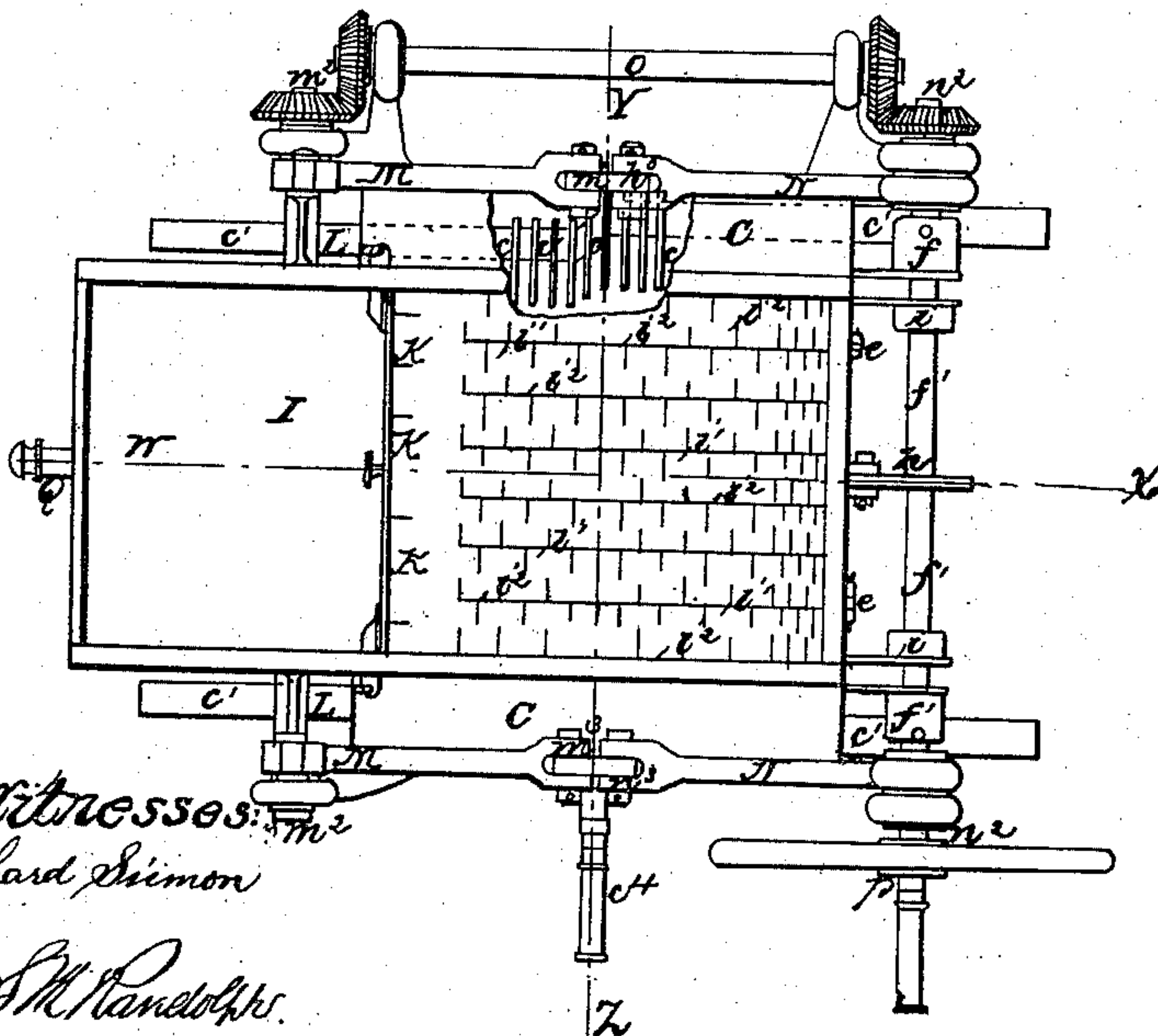


Fig. 2



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Fig. 3

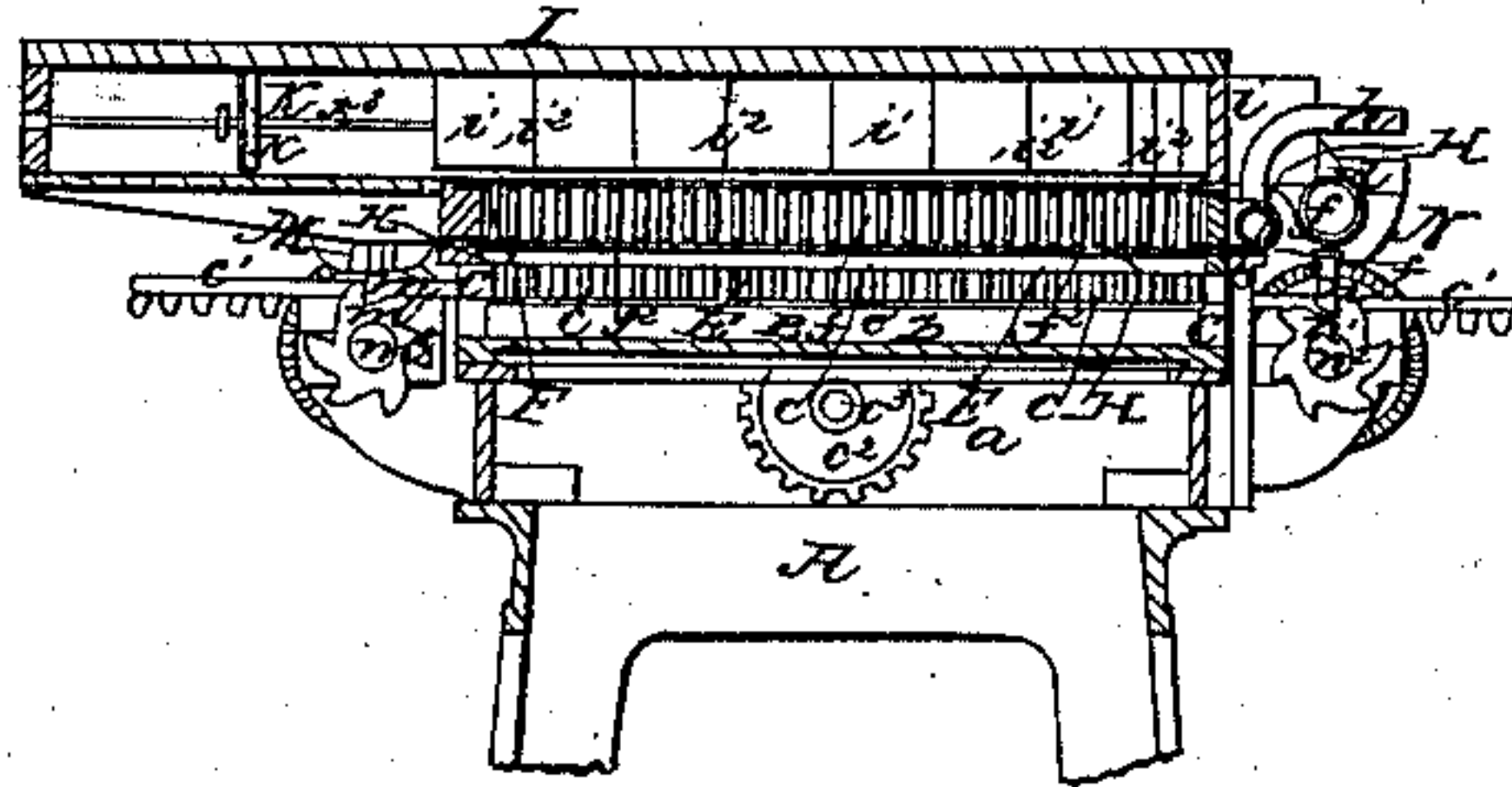


Fig. 4.

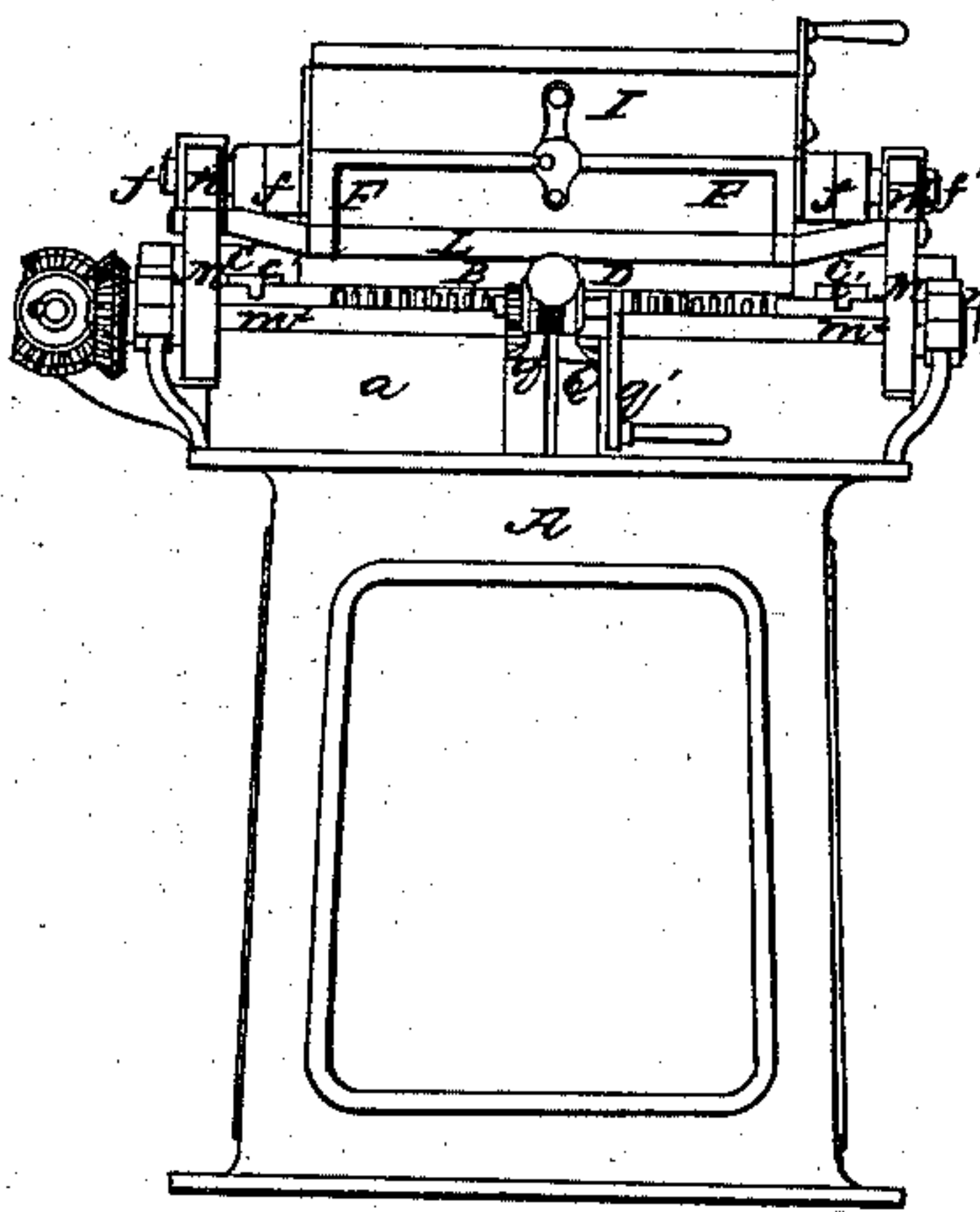


Fig. 5

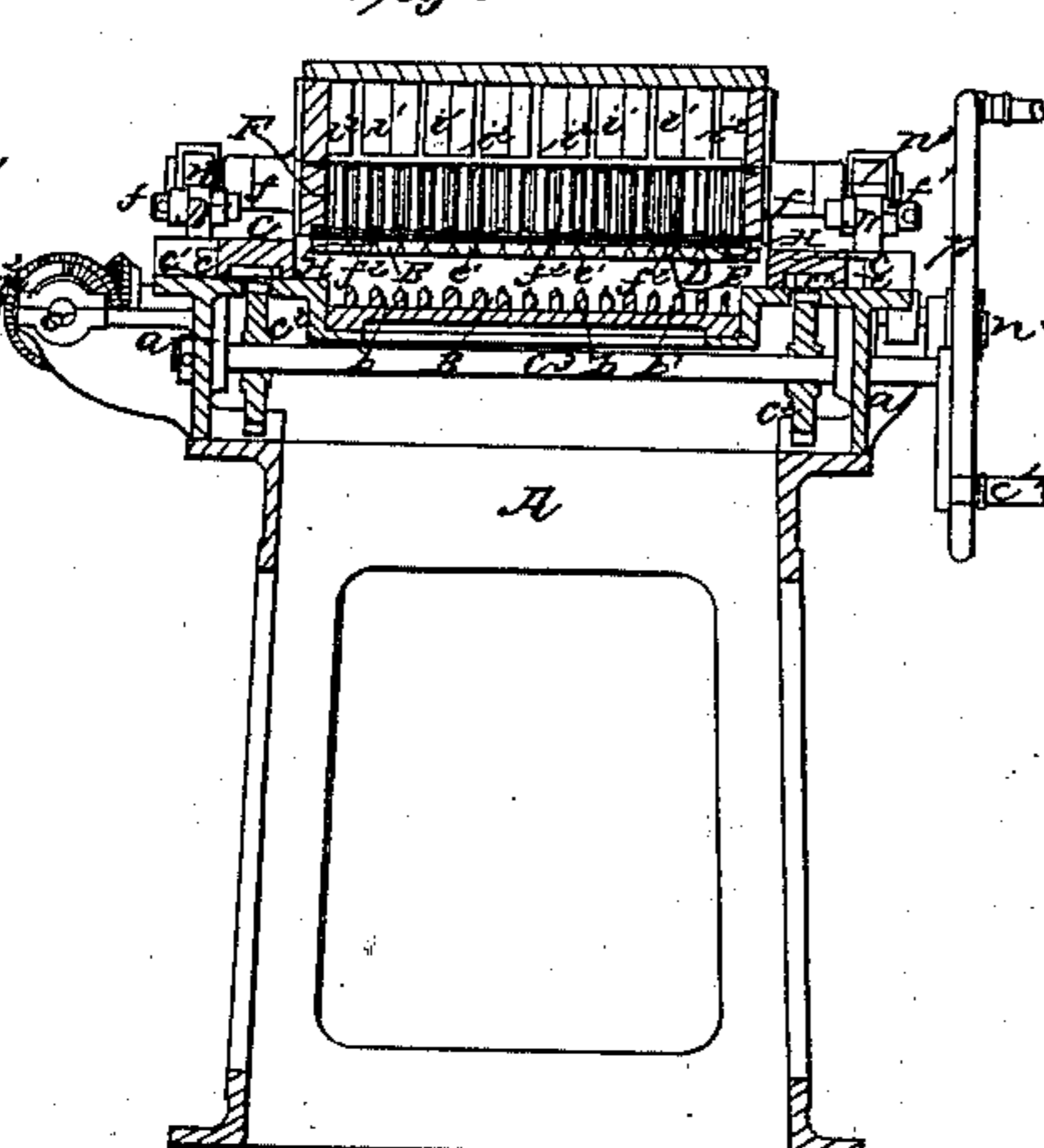


Fig. 6

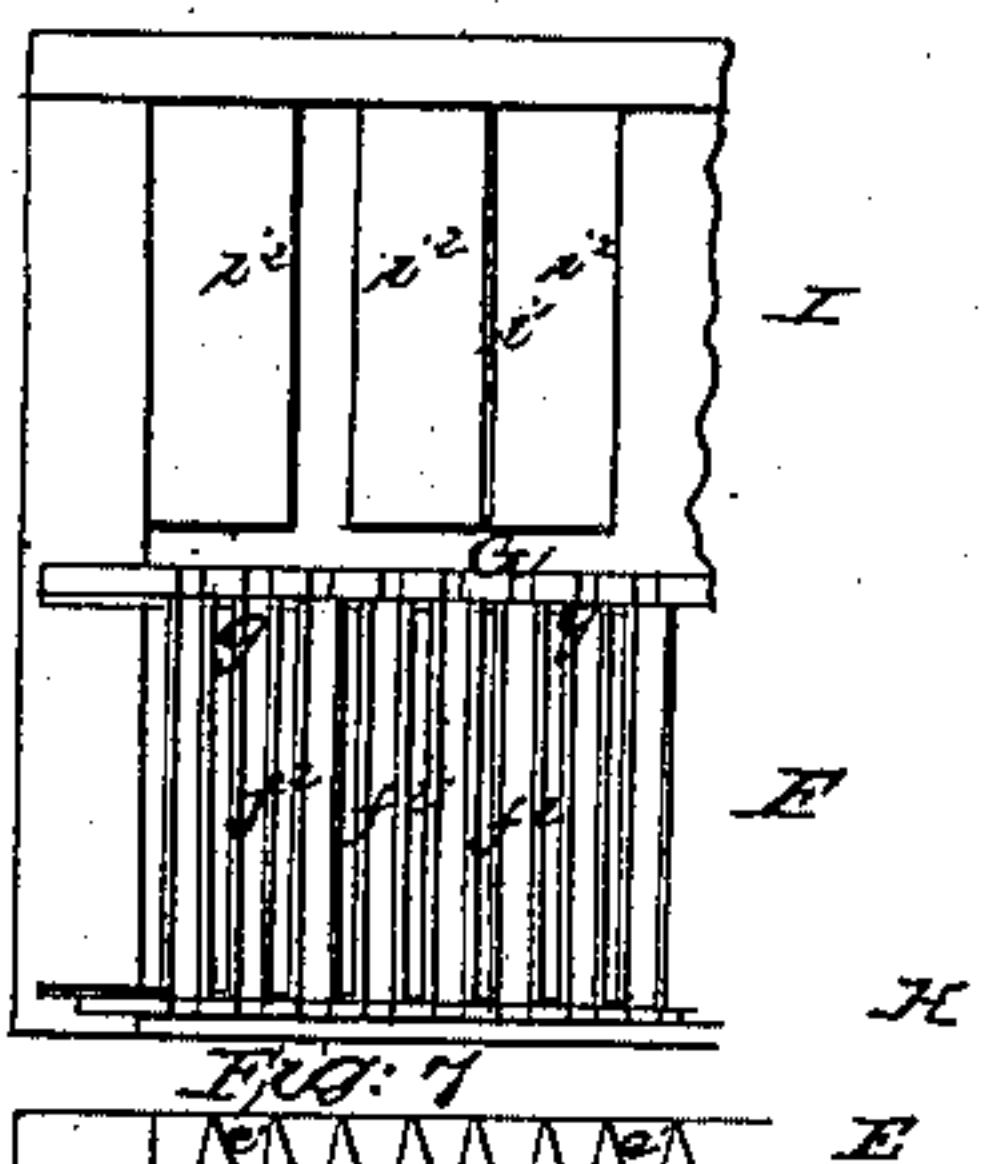


Fig. 9

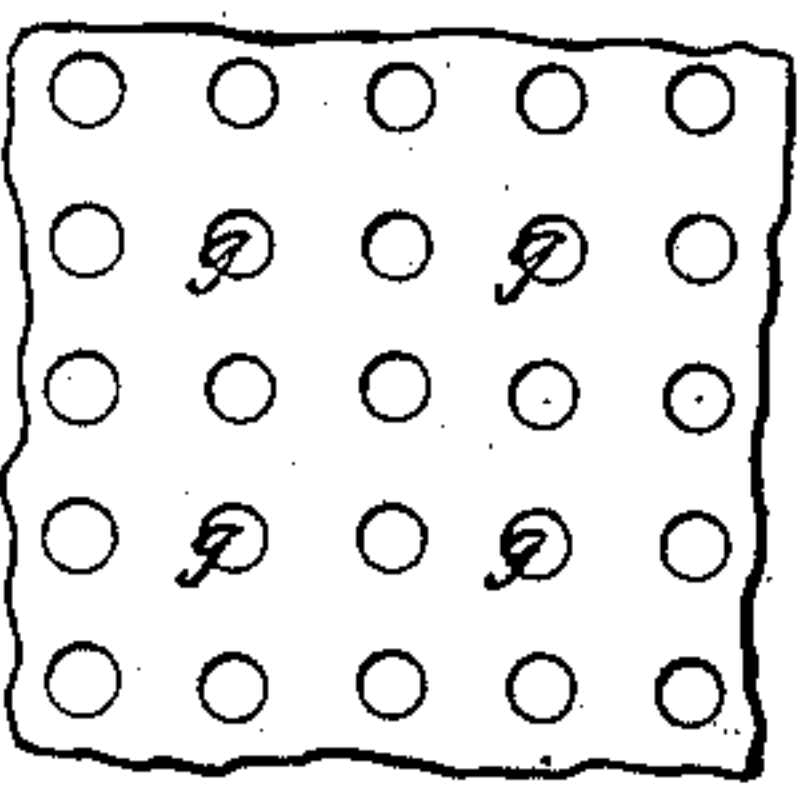


Fig. 10

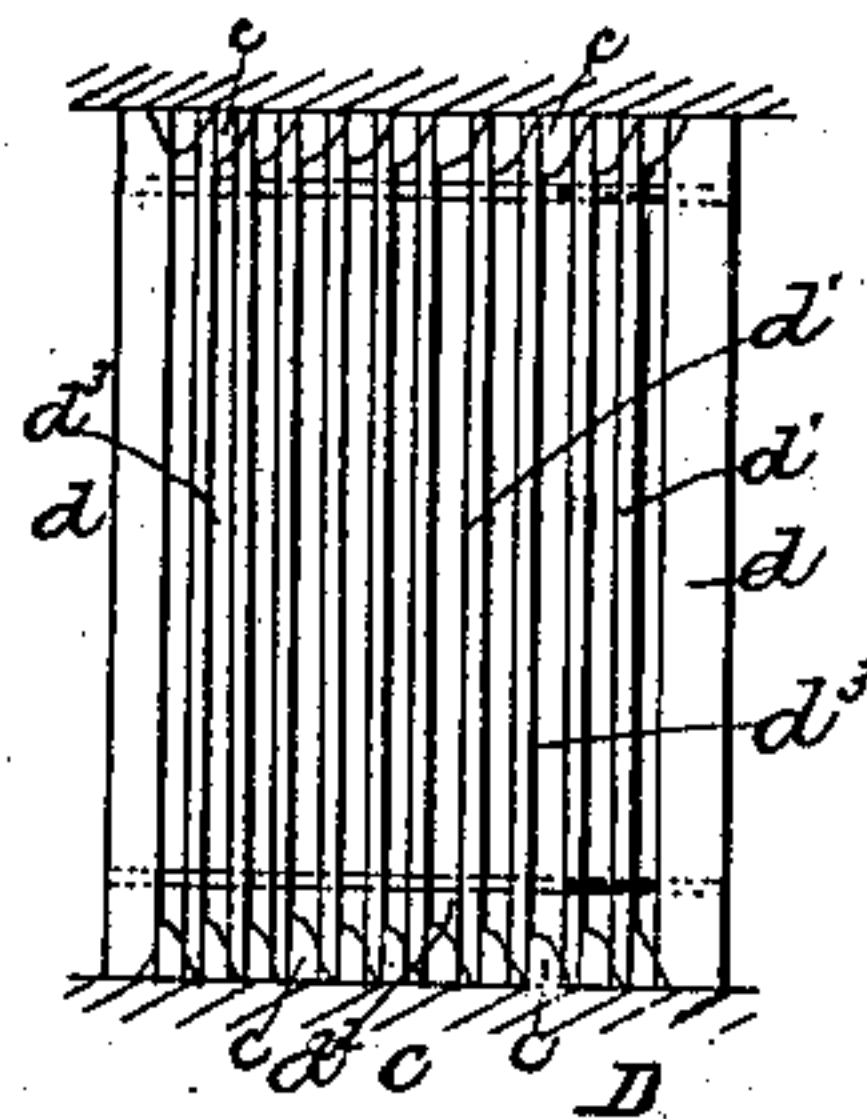


Fig. 8



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United States Patent Office.

GEORG SEBOLD, OF DURLACH, GERMANY, ASSIGNOR TO JOHN F. ZISEMANN AND HEINORE RASHCOL, OF ST. LOUIS, MISSOURI.

Letters Patent No. 78,837, dated June 9, 1868.

IMPROVEMENT IN MACHINES FOR PLACING FRICTION-MATCHES IN FRAMES FOR DIPPING.

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, GEORG SEBOLD, of the city of Durlach, in the Grand-Duchy of Baden, Germany, have made certain new and useful Improvements in Machines for Framing Match-Sticks or Splints; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

It is well known that match-sticks or splints, after having been cut to proper size, and preparatory to being dipped into the sulphur, phosphorus, or other easily-inflammable composition, are usually set in frames, and that this process has hitherto been solely or almost solely done by manual labor.

The object of my said invention is to greatly lessen the labor, and decrease the time required in said operation; and the operation of my said machine, in fulfilling said object, is to receive the said splints, properly sized, in large quantities, and (under the application of power of whatever kind,) set them properly in frames, and secure them therein.

To accomplish said objects, the nature of my invention is in the application of certain principal devices, as follows.

Firstly, a receiving-box, into which properly-sized splints are placed in large quantities, and connected herewith, certain shaking-devices, to properly distribute the splints in said receiving-box.

Secondly, a guide-tube box, into the tubes of which the splints are passed singly; and this by the aid of another series of shaking-devices.

Thirdly, a series of retaining and sustaining-plates, which act with the splint-frame, to hold the splints in said frame until, by the action of,

Fourth, the devices or compressors, the splints are compressed in the frame, and thus finally secured.

In connection with and accessory to said principal devices, I have arranged certain detail devices, as will hereinafter more fully appear.

To enable those skilled in these arts to make and use my said machine, I will now fully describe the construction and operation thereof, having reference herein to the drawings, of which—

Figure 1 is a side elevation,

Figure 2 is a top plan, with the cover removed,

Figure 3 is a sectional elevation, in part, along the line W X. of the plan; all of said figures being on Sheet No. 1; and

Figure 4 is a front end elevation,

Figure 5 is a sectional elevation along the line Y Z of the plan; and

Figures 6, 7, 8, 9, 10 are detail views, hereinafter more fully described; said figures being on Sheet No. 2.

I place the working parts of my said machine upon a metallic (usually cast-iron) frame or stand, A. The said stand bears the cast foundation-rim *a*, this being firmly secured to A by bolts and flanges in the usual manner. Upon said rim *a*, and in a recess thereof, as fairly shown in fig. 5, I secure the channel-plate B. This plate is shown in an enlarged section in fig. 8. On the bottom of the channels hereof the splints have their lower support, resting thereon while standing on end, and the ridges *b* of said plate giving a lateral vertical support, partly acting to retain the splints in vertical position in the spaces *b'*.

Upon said channel-plate B, or over the same, and between the guide-ways C, which are permanently secured to the rim *a*, I place the splint-frame D, wherein, by the action of other parts of this machine, the splints are to be placed and retained, preparatorily to their being dipped, as heretofore stated. The said frame D, as more fully shown in the enlarged detail plan, fig. 10, has strong end slats, *d*, fitting accurately between the guide-ways C. Between said end slats *d* are the small slats *d'*, strung upon the rods *d''*, and similarly fitted between the ways C.

After the frame D has been inserted, the slats *d'* are held at proper distances apart, to receive the splints

in the spaces d^3 , between said slats, by the vertical spacing-slats c . These are supported and guided in the ways C . In order that the spaces c may readily enter between the slats d^1 , the said slats d^1 are chamfered at ends, and the spaces c have rounded ends, as shown in fig. 10.

After the spaces d^3 of the frame D have been properly filled with splints, (the splints standing upon the channel-plate B , and supported on the one vertical side by the longitudinal ridges b , and on the other vertical edge by the transverse slats d^1 of the frame D), it becomes necessary to withdraw the spaces c . This I accomplish by the racks c^1 , moving in guides in the ways C . The said racks have their upper flat parts bent, as shown in plan, fig. 2, (where the overlying parts are supposed removed.)

The spaces c being guided in their transverse motion in the slots of the ways C , and the same being placed over the racks c^1 , the spaces are thus, by the alternate forward and return motion of said racks, through the action of the crook of the racks, successively forced out between the slats of the frame D , or drawn back. To accomplish said reciprocating motion of the racks c^1 , I have arranged the spur-gear wheels c^2 on the shaft c^3 , all turned by the hand-crank c^4 . The shaft c^3 has proper bearings in the foundation-rims a of the machine-body.

Above the splint-frame D , I arrange the guide-slat frame E , the frame whereof is hinged at e to the rim-body of the machine, as indicated in the plan, fig. 2. Within the said frame I arrange, running longitudinally, the conically-pointed slats e^1 , as indicated in the detail section, fig. 7. When in place on its bed in the machine, said frame E lies horizontally, and acts to guide the match-splints to the spaces d^3 of the slat-frame D . When the frame D has been filled, the guide-frame E may be readily raised to a vertical position, then turning upon its said hinges e .

Above said frame E , I arrange the guide-tube box F . The sides hereof are usually of wood, and hinged at the rear end, by the hinges f , to the axle f^1 , and rests on the body of the machine. The upper and lower plate of said box proper are usually formed of composition-metal, arranged to receive the vertical tubes f^2 , said tubes being of such diameter that at least two splints, of the usual size, may pass vertically through the same. In order, however, that the splints shall pass, one at a time, through said tube, I have placed over the top plate of the box F , proper, the sieve G . This is also usually made of brass, having the holes g of such size that but one splint can pass at one interval of time. The holes g of the sieve G lie centrally over the tubes f^2 , thus permitting splints to pass through vertically. Below the bottom plate of the box F proper I arrange the check-sieve H , having holes corresponding to the bore of the tubes f^2 . Said sieve H moves between guides formed by the sides of the box F . In order to insure a proper filling of each tube f^2 with a splint at each charge of the machine, it is necessary to close the passage beyond said tubes f^2 . This is done by moving the sieve-plate H a distance equal to the diameter of the tube-bore, by the hand-bar h , which being supported in a bearing, h^1 , on the rear end of F , acts upon a slotted bar secured to H , as shown in fig. 3.

Immediately upon the box F , I arrange the receiving-box I , usually of wooden sides, having the hinges i connected with the axle f^1 , before mentioned. Said box has a wooden cover, which can be easily disconnected when required. Running longitudinally within said box are the partition-plates (usually sheet iron,) i^1 ; and connected herewith, and connected with the longitudinal sides of I , are the transverse plates i^2 . It will be seen that there is a passage between said transverse plates, longitudinally, by reference to the plan, fig. 2. The box I receives the match-sticks or splints in large quantities, the same being placed in a vertical (or nearly vertical) position herefor, being then mainly supported upon the axle f^1 . When the box I is in this position, the splints are placed into the same, lying nearly or quite horizontal. In order to retain the splints in their relative position to the box, I arrange the pressure-slide K , having plate-ribs, k , similar to i^2 . The slide K being pressed against the packing of splints in I , the proper pressure is added by the weights k^1 , acting through ropes k^2 . To adjust K properly, its ends are moved in the slot k^3 , in the sides of I .

In order that the charge of splints placed in I may be properly distributed under the action of the pressure-slide K , and that the feed of splints to the guide-tube box F , and the feed herefrom to the splint-frame D may be properly effected, I have arranged, in connection with said boxes I and F , the shaking-devices now to be described. Moreover, the detail construction of said shaker-devices is such that the boxes I and F may be raised to a vertical position, and that this motion is properly guided to insure a return of said boxes I and F to the exact relative position to the frame D , when said boxes are placed on the bed on the machine.

When said boxes I and F are laid horizontally in position for communication with parts below, the forward end thereof is supported by the transverse bar L , secured to the lower edge of F , as indicated in fig. 4. The end journals of F rest upon the shaking-lever M . The forward end hereof has the tappet m , operated upon by the ratchet-like wheel m^1 , upon the shaft m^2 . The rear end of the lever M is journalled upon a bearing, m^3 ; hence, in the vibratory motion of the lever M , bar L , and box F , said parts are held subject to the guide formed by the connection of M with m^3 .

Similarly, the axle f^1 , upon which the boxes I and F are secured by hinges, as hereinbefore recited, rests, by its bearings, upon the shaking-levers N , these having at their rear end the tappet n , operated by the ratchet-like wheel n^1 , upon the shaft n^2 . The forward end of N is pivoted at n^3 , and the vibratory motion to be caused by the action of n^1 on n , is thus again guided. Moreover, the connection of said boxes I and F , respectively, by the levers M and N , with the bearings m^3 and n^3 , respectively, (these being fixed in their relative positions to the lower parts of the machine,) insures the proper relative position of the boxes I and F , with respect to the guide-frame E , splint-frame F , and channel-plate B , which, in the operation of my said machine, is a matter of vital importance.

In order to communicate motion to the shafts m^2 and n^2 , I connect the same by the longitudinal shaft o , and the necessary mitre or bevel-gear wheels, substantially as indicated, and place the hand-wheel p upon the shaft n^2 , or operate said shaft n^2 by steam or other power, in any of the usual methods.

As was heretofore stated, in order to facilitate the passage of the splints between the slats d^1 of the splint-frame D, said slats are spaced apart by the spacers c . Whenever said operation of filling has been completed, and the spacers c have been withdrawn, the slats d^1 must be pressed together to retain the splints, so that the filled frame may be handled in dipping, and so forth. This compression I accomplish by the compressor-rack Q, which presses against the outer slat of D, being forced forward by the pinion q , and the operation thereof, through the handle q' .

The connection of the several parts now explained, the bearings of shafts, and similar detail features, will fully appear from the figures, the figs. 1 to 5, inclusive, being in about one-eighth full size of machine.

The construction here described is not absolutely necessary to the nature of my invention. Thus, the tubes of the box F might be made conical, being of an upper diameter equal to the holes of the sieve G. In this case the sieve G could be omitted. Similarly other details might be varied, all said variations being included in the nature of my said invention.

The operation of my said machine is as follows: The receiving-box I being thrown up in a nearly vertical position, the splints are laid therein. In order that the splint-frame D may be conveniently inserted, the parts F and E are also turned up into a vertical position. By means of a proper brush, the channel-plate B has been cleansed of dust or splinters caused by previous workings. The splint-frame D is then laid between the ways C, and by one turn of the crank c^1 the spacers c are made to properly space the slats of the frame D. Thereupon the guide-slat frame E is turned down over the frame D. The parts E, D, and B, now in position, form, by the arrangement of their respective slats and ridges, a series of vertically-sided square or rectangular spaces, which are to be filled with splints.

Supposing, by the action of the hand-lever h , the sieve H to be in the check position before described, the boxes F and I are now turned to their position horizontally. Thereupon, by the operation of the shaking-devices through the hand-wheel p , the splints will pass singly from I, through the sieve G, into the tubes f^2 of the guide-tube box F, being now prevented from further motion by the check-sieve H. It will be well to then again raise the parts I and F into vertical position, and then lower F alone upon its bed. The check-sieve H is then moved by the hand-bar h , to open passage, and the splints drop into the rectangular spaces formed by the parts E, D, and B, until they rest evenly upon the channel-plate B, and their lower edges thus being even, they are properly placed for dipping. It will be well, thereupon, to close the check-sieve H, to place F in position for a new charge. The spacers c are now withdrawn by a return movement of the crank c^1 . The guide-slat frame E and box F are now again turned vertically. Then, by the action of the handle q' , the compressor is made to secure the splints between the slats of the frame D, and a peg or rail put into the rods d^2 , prevents the slats from receding. The splints being thus secured, the frame is lifted off, and the operation may be repeated as heretofore.

The frames are usually of such size as to receive two thousand splints at one charge, and the time required by one operator for each charge is one minute, usually, making a daily total, of splints framed, of twelve hundred thousand, this being the work of about twenty operators, when working solely by hand. Moreover, owing to the position of the splints upon the channel-plate B, they are, with the ends to be dipped, in one plane, and do not need to be lined, as now is usually the case.

Having thus fully described my said machine, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The receiving or feed-box I, arranged with longitudinal plate-ridges i^1 , having transverse projecting slats i^2 , substantially as set forth.
2. The pressure-slide K, actuated by ropes and weigues, in combination with the feed-box I, substantially as and for the purpose set forth.
3. The guide-tube box F, and its tubes f^2 , the sieve G, and check-sieve H, substantially as and for the purposes set forth.
4. The boxes I and F, in combination with the axle f^1 , the shaking-lever N, and pivot n^2 , substantially as set forth.
5. The guide-slat frame E, having longitudinal slats e' , in combination with the splint-frame D, having transverse slats d^1 , and the channel-plate B, substantially as and for the purposes set forth.
6. The splint-frame D, arranged with slats d^1 , chamfered at ends, substantially as set forth.
7. The spacers c , in combination with the slats d^1 of the frame D, constructed and operating substantially as set forth.
8. The compressor-device Q, acting upon the slats of the frame D, substantially as and for the purpose set forth.
9. The supporting-bar L, in combination with the shaking-lever M and shaking-wheel m^1 , acting substantially as set forth.

In testimony of which invention, I hereunto set my hand, in presence of

GEORG SEBOLD.

Witnesses:

GEORGE F. KETTELL,
ROSINE HEMERLE.