A. J. French.

Mach. for Lining Percussion Caps.

No. 68725 Patented Sept. 10. 1867

Fig: 1

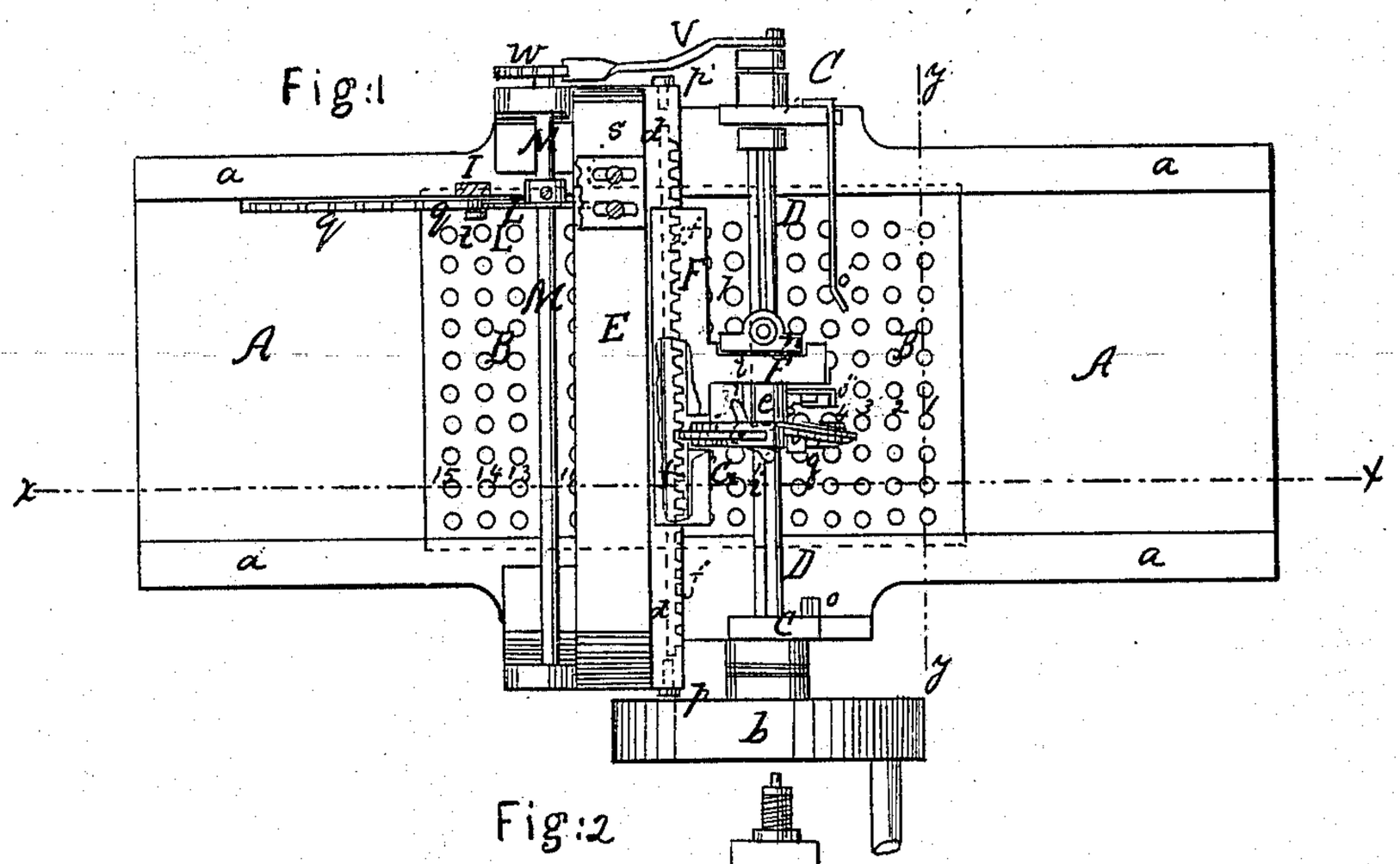


Fig: 2

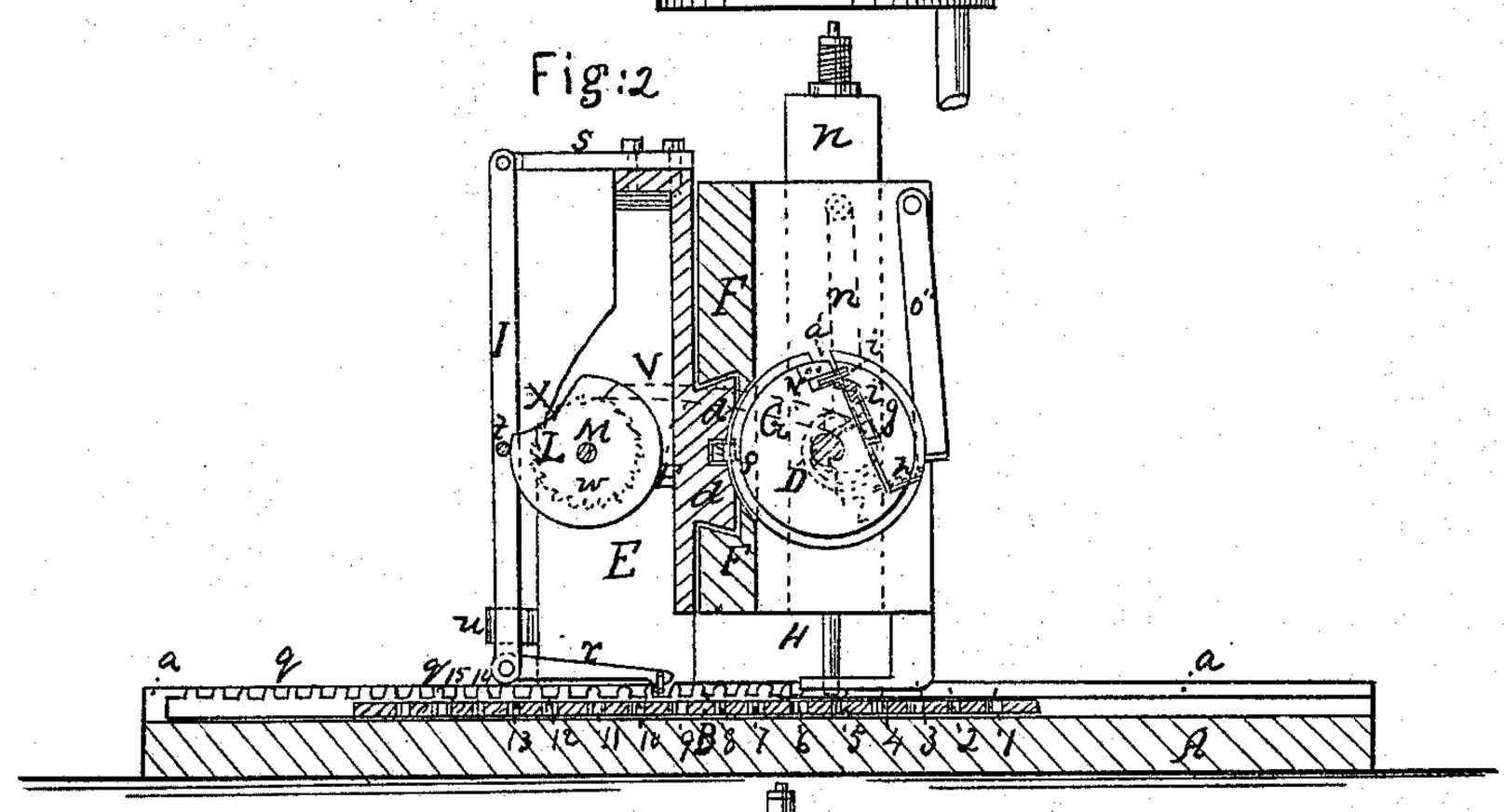


Fig: 3

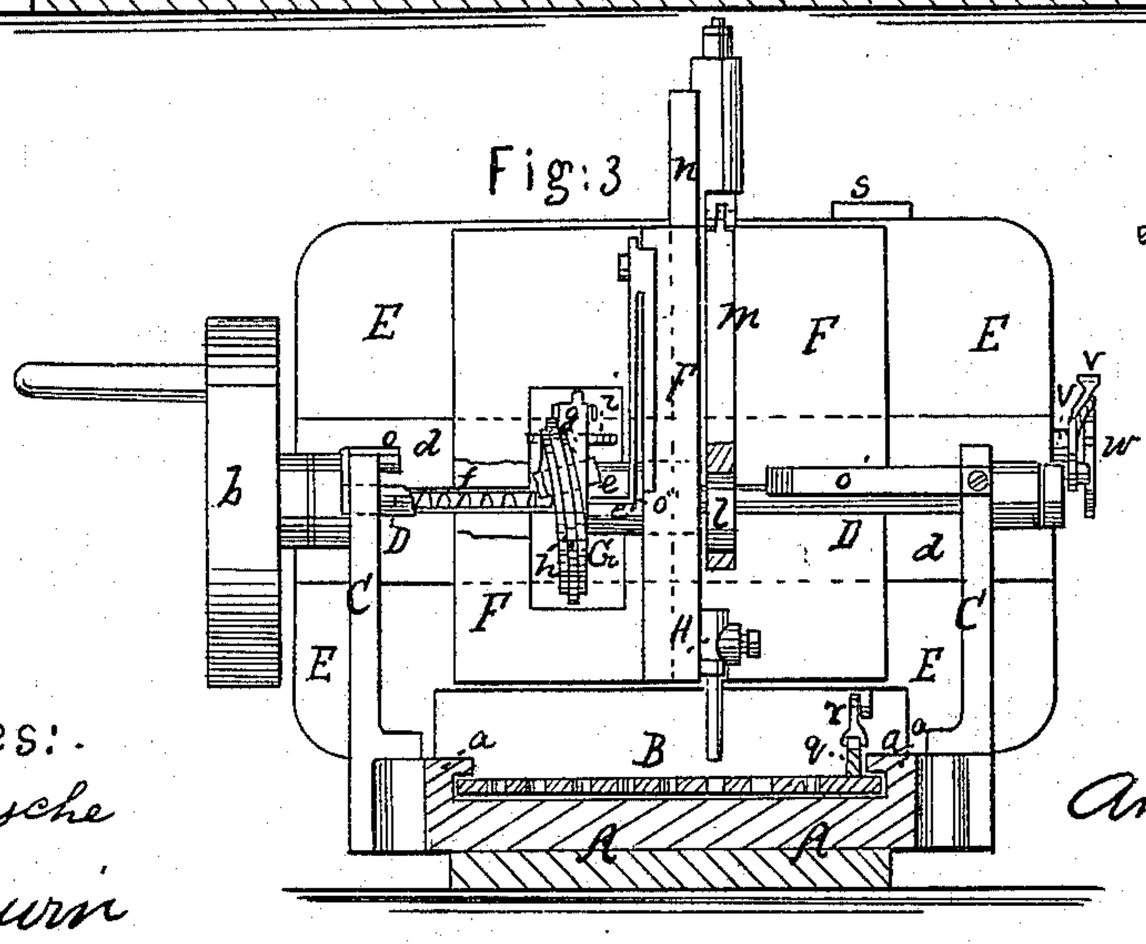
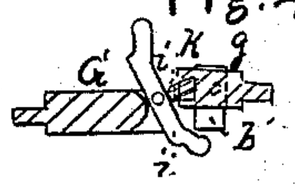


Fig: 4



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ANDREW J. FRENCH, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE WATERBURY BRASS COMPANY.

Letters Patent No. 68,725, *dated September* 10, 1867.

IMPROVEMENT IN MACHINE FOR LINING PERCUSSION-CAPS.

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, ANDREW J. FRENCH, of Waterbury, in the county of New Haven, and State of Connecticut, have invented a new and improved Machine for Lining Percussion-Caps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings forming part of this specification.

The object of this invention is to construct a machine whereby percussion-caps may be lined with tin-foil in a rapid and satisfactory manner, the machine being simple and compact, and cannot easily get out of order.

The invention consists in the use of a horizontal sliding plate, which is provided with holes which are arranged in rows, and in which holes the caps are placed. A punch is brought down into each hole, lining all the caps in succession, the punch moving on a stationary guide across the said horizontal plate, so as to come over each hole in one row of holes in the plate. When one row has been lined, the plate is moved so that the next row is brought under the punch, which moves along this row, lining each cap in the same. All the movements are automatic, and all the parts are moved at the proper time and in the proper direction by simply revolving the driving-shaft. The devices for moving the punch back and forth across the plate, and also the device for feeding the plate under the punch, constitute the main features of my invention. In the annexed drawing my invention is illustrated—

Figure 1 being a plan or top view, partly in section, of my improved machine for lining percussion-caps.

Figure 2 is a longitudinal vertical section of the same, the plane of section being indicated by the line *x x*, fig. 1.

Figure 3 is a vertical cross-section of the same, taken on a plane indicated by the line *y y*, fig. 1.

Figure 4 is a detail view to be hereinafter referred to.

Similar letters of reference indicate like parts.

A represents a bed-plate, made of cast iron or any other suitable material. On its sides are arranged projecting metal linings, *a*, in which are grooves for guiding a metal plate, B, so that the latter can move from end to end of the machine. The plate D is perforated with holes which are arranged in rows, as shown in fig. 1, said rows being numbered from 1 to 15 respectively in the drawings. The holes in each of these rows are arranged exactly in line with the holes in the other rows, as shown. C C are two upright posts or supports, in which are arranged boxes for the horizontal shaft D, which is arranged across the plate B and above the same, as shown. Rotary motion is imparted to the shaft D by a belt running over a pulley, *b*, or otherwise. E is a stationary frame, cast with or securely attached to the bed A, being arranged parallel with the shaft D, and near to the same, as shown in the drawings. To the face of this frame E, between the same and the shaft, is attached a dove-tail tenon, *d*, extending the whole length of the said frame. This tenon fits into a corresponding groove in a sliding frame, F, which is mounted on a sleeve, *e*, on shaft D. The sleeve *e* is provided with a feather, which fits into a groove arranged along and in the shaft D, as shown in figs. 1 and 2, so that the sleeve must revolve with the shaft and within the frame F, the latter being held in position by the tenon *d*, but the sleeve may also slide on the shaft, and being provided with shoulders on each side of the frame F, the latter must slide with the sleeve. On the sleeve *e* is firmly secured a disk, G, the rim of which fits between the teeth of a rack, *f*, which is arranged on the frame E. One portion, *g*, of the rim of this disk G is hinged in such a manner that its end can be moved to either side of the disk, thereby making the rim of the disk spiral or screw-shaped. The part *g*, which may constitute more or less than a quarter of the circumference of the disk G, as may be desired, is pivoted to the body of the disk by means of a pin, *h*, (shown in dotted lines in fig. 2,) and can be turned on the said pin, so that its other non-pivoted end may be swung either to one or the other side of the disk, In the disk G is pivoted, opposite to the free end of the swinging portion *g*, a plate, *i*, which is provided with a pin, K, which fits into the part *g*. Both ends of the plate *i* are projecting beyond the face of the disk, as shown in fig. 4, which is a detail sectional view of this portion of the disk. As the plate *i* is turned on its pivot it swings the rim *g*, by means of the pin K, to one side of the disk. From the above it is obvious that for changing the thread of the screw, formed by the disk G and rim *g*, it is only necessary to strike one end of the plate *i*, and so swing the said plate around its pivot. The swinging piece *g* is prevented from being turned too much by stops *a' a'* arranged on either face of disk G, as shown, and the piece *g* is steadied, guided, and strengthened

by the use of a dove-tail tenon, *b'*, which is pivoted to the disk G, and fits in a groove in *g*, and turns on its pivot as the piece *g* swings to one side. On the horizontal sliding frame F is arranged a vertically sliding punch, H, which receives reciprocating motion from an eccentric, *l*, on shaft D, to which a connecting-rod, *m*, is secured, the upper end of which is attached to a frame, *n*, which holds the punch. The said frame *n* is slotted so as to move up and down without coming in contact with the shaft D. The proportions of the parts are such that the punch is moved across the plate B by means of the worm G engaging between the teeth of the bar *f* just as far as one hole in each row is from the other, and after having arrived over a hole the punch is moved down into the hole, and lines the cap therein, some tin-foil being, for that purpose, fed below the punch. The thread of the worm G is changed, when the punch arrives at the end of a row, by means of stops *o o'*, with which the extremity of the plate *i* comes in contact, and whereby the part *g* is shifted. The punch would then be moved across the plate B again, but in the opposite direction. As soon as the last hole in a row is made the plate B is moved forward by a mechanism hereinafter to be described, so as to bring the next row below the punch. But if the punch would move directly back after having lined the last cap in a row, the first cap in the next row would be omitted. For the purpose of avoiding this inconvenience, I have made the rack *f* in the form of a bar which fits in a groove in the tenon *d*, as shown. At each end the groove is closed by stops *p p'*, which are made in the form of heads of screws or otherwise, and the bar *f* is as much shorter than the groove as the distance is from hole to hole in each row, the bar *f* being thus enabled to slide in the groove. When the punch is, for instance, moving on the shaft D towards the pulley *b*, the rack will, by the shape of the thread of the worm, be always pressed against the stop *p'* on that end from which the punch has started. As soon as the punch arrives at that end of the row which is nearest the pulley *b*, the thread of the worm G will be changed by the stationary stop *o* at that end of the machine, but at the next revolution of the shaft D the punch will not move back yet, but the worm G will, by means of its reversed thread, draw the bar *f* towards the stop *p*, which is on the same end of the frame E on which the punch is standing. During the revolution of the shaft D which was required to shift the bar *f*, the plate B has been moved forward so as to bring the next row of caps under the punch, and as soon as the rack is shifted the punch is forced down into the first cap in the new row. Then the punch moves on the shaft D again, and is forced successively into each cap into the row until it arrives at the other end of the row, when it will again be held during the shifting of the plate B and rack *f*, and be forced into the cap at the end of the next row, when it will begin to slide back again, and so forth, until all the caps in the plate B have been lined. The revolutions of the shaft D are then stopped, the plate B refilled with caps and moved back on the bed A until the row No. 15 is below the punch, when the operations will again begin as before. The stops *o o'* may be arranged in any desired manner, either stationary, as *o*, or flexible, as *o'*. The latter is represented in the drawing as being a rod with an inclined surface, which presses, as the punch comes near it, against a pivoted bar, *o''*, on the frame F, said bar *o''* having a pin which strikes against the plate *i* as soon as *o''* is moved in by *o'*. A spring throws *o''* into the original position again as soon as it is released from *o'*. But any other suitable stop arrangement may be employed, a stationary one being the simplest form, as shown at *o*.

I will now proceed to describe the device for feeding the plate B forward, so as to bring each row of caps under the punch at the proper time and in proper order.

To one side of the plate B is secured a toothed bar, *q*, the teeth of which are engaged by a pawl, *r*, which is arranged on a swinging bar, I. The latter is hinged at its upper end to a slotted bar, S, which is secured to the stationary frame E by means of screws, as is shown in figs. 1 and 2. On one side of the bar I is arranged a projecting pin, *t*, which is by means of a spring, *u*, pressing against the bar I, pressed against the periphery of a disk, L, which is mounted on a horizontal shaft, M, as shown.

The shaft M is mounted in boxes which are arranged in arms extending from the frame E, and receives intermittent rotary motion from a pawl, V, attached to an eccentric on the end of the shaft D, which pawl moves a ratchet-wheel, *w*, on the end of shaft M. The said ratchet-wheel has as many teeth as there are holes in each row on the plate B, so that as it is moved one tooth during each revolution of the shaft D, it makes one revolution, while the punch moves from one end to the other of the plate B. The simple revolution of the shaft M has no effect upon the pawl *r* or plate B, but as one revolution is completed the pin *t* on the bar I is pressed by the spring *u* into a recess or depression, X, which is arranged on the periphery of the disk L. Thereby the pawl is thrown into a notch in the bar *q*, and when at the end of the recess the pin *t* is thrown against the real periphery of the disk L, the pawl is drawn back and pulls the bar *q* and plate B with it, so that a new row of caps is brought under the punch, as soon as one row has been finished. Although this device for feeding the plate B is new, and part of my invention, I do not wish to confine myself to its use, as many other devices may be arranged on this machine which will work equally well, while the device for feeding the frame F can hardly be simplified.

What I claim as new, and desire to secure by Letters Patent, is—

1. The reversible worm G with its sleeve *e* working upon the grooved shaft D, and provided with an oscillating dog, *g*, substantially as set forth.

2. The device for feeding the frame F, consisting of the sleeve *e*, worm G, ratchet-bar *f*, shaft D, all made and operating substantially as herein shown and described.

3. The sliding toothed bar *f* in combination with the reversible worm G and stops *o o'*, for the purpose of retaining the punch in position so as to line the first cap in a new row, all as set forth.

4. The device for feeding the plate B, consisting of the recessed disk L on shaft M, and of the pawl *r* on swinging frame I, all made and operating substantially as herein shown and described.

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