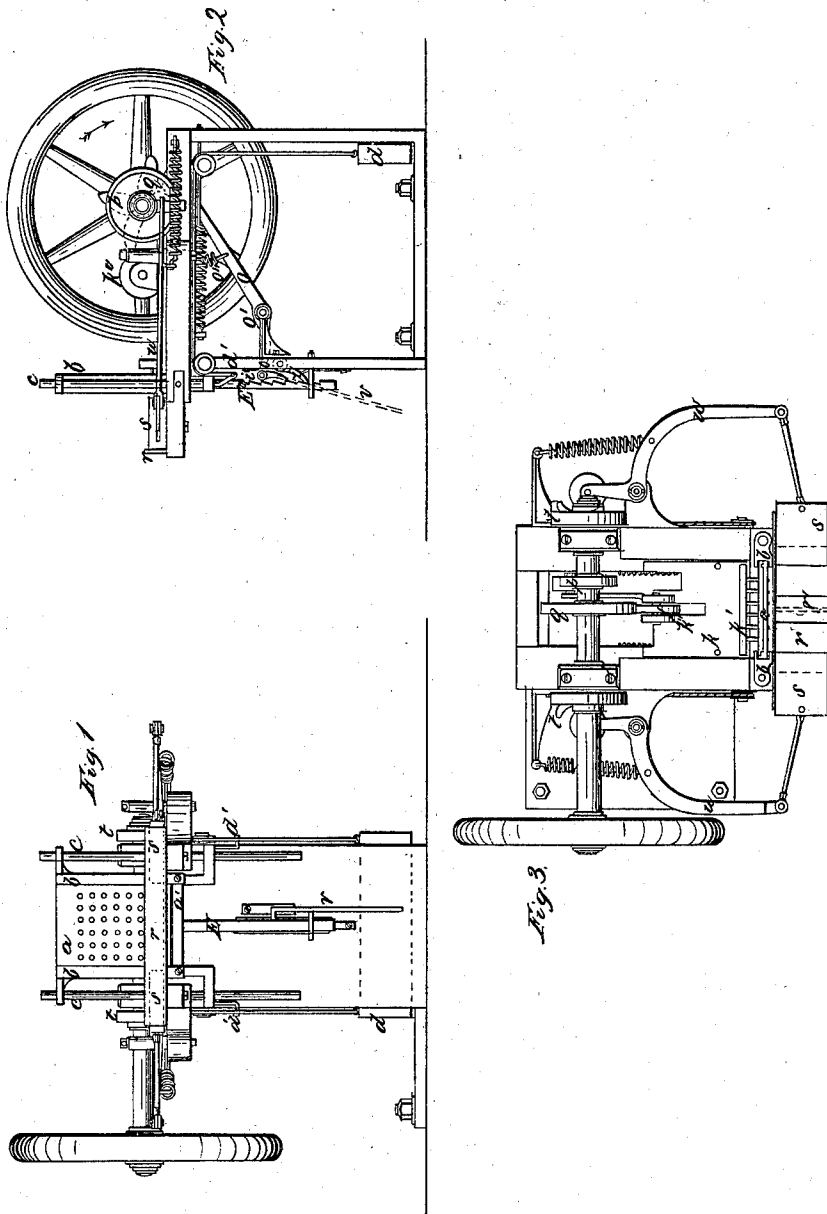


T. COOK.
PACKING MATCHES.

No. 17,316.

Patented May 19, 1857.



UNITED STATES PATENT OFFICE.

THOMAS COOK, OF NEW YORK, N. Y.

MACHINE FOR GATHERING AND DEPOSITING DIPPED MATCHES.

Specification of Letters Patent No. 17,316, dated May 19, 1857.

To all whom it may concern:

Be it known that I, THOMAS COOK, of New York, county of New York, and State of New York, have invented certain new and
5 useful Improvements in Machinery for Gathering and Packing Matches; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawing, making a part of this specification, in
10 which—

Figure I is a front elevation. Fig. II is a side elevation. Fig. III is a top or plan view, and similar letters indicate similar
15 parts throughout.

My invention consists of a means for automatically discharging the matches from the “dipping boards” and depositing the same into the boxes without said matches requiring any handling by the workman. The old
20 mode consisted in pulling the matches out of the holes of the dipping-board, by hand and depositing them in that manner in the boxes. This mode besides being slow and
25 expensive, as compared with my improved method, was also dangerous and wasteful of matches, in that they frequently took fire by the friction caused by pulling handfuls out of the board in a rough manner, all which
30 is obviated by my machine.

I use the improved divided “dipping board,” but to which I lay no claim. This consists of two pieces of wood placed together and drilled full of holes in exact
35 rows, into which the splints are in the first instance thrust, fitting loosely. When full, one half of the “board” is shifted slightly to one side, and thus, by crossing, the holes pinch the splints and hold them firmly. The
40 “board” can now be turned down horizontally without letting the sticks fall out, and thus the composition is easily applied to their ends in the dipping vat. When dry and ready for being discharged, I unclamp
45 the splints by shifting the boards back so that the holes in both will coincide. This must be done while holding the “board” in a vertical position, and in which position it is now placed in my machine. A vertical
50 sliding but intermitted motion is given to it now, whereby it is fed downward, a row of holes at a time. At every feed the matches in a row are discharged upon a table, from which they are gathered up by the
55 machine and deposited in a box. This is then removed and another box held up in

order to receive the next discharge of matches, and so on until the “board” is emptied, when that is removed and a full one introduced as at first.

The “dipping-board” is seen at (*a*), and
60 stands in a frame work the two vertical side pieces (*b*) of which are grooved of a width to receive the board (*a*), which latter rests upon the bottom cross piece (*a'*) Fig. I. The frame slides in two vertical guide rails
65 (*c*) secured to the frame at the end of the machine. The frame is kept up by a long counter weight (*d*) which is attached by cords rove over the pulleys, a cord at each
70 lower corner, as at (*d'*). This weight is sufficiently heavy to support the frame with the dipping board in. The discharge of matches takes place first from the lower
75 holes, consequently it starts from the top, as in Figs. I and II and is fed downward. This feeding down is against the force of the weight, and is performed by a straight ratchet, and pawl working into it. The
80 ratchet is seen at (*e*) attached to the center of the lower cross rail (*a'*). Behind this are two pawls (*i*) and (*i'*) Fig. II, of which (*i'*) is a detaining pawl while (*i*) effects the movement downward. This latter is
85 attached to the short end of a lever (*o*) having its fulcrum at (*o'*), the opposite or long end terminating in a friction roller. Upon the top of the frame is a cross shaft with
90 fly wheel and crank or pulley on its end for driving it, and having between, several cams. A cam at (*p*), being two cross arms, strikes the roller and gives motion to the lever (*o*). The cam raises the pawl end of
95 the lever and gives the feed for notches, but the frame is pushed down by a recoil spring (*o''*), the pawl (*i'*) holding the frame down against the weight (*d*) while (*i*) retreats for
100 a new notch. At each feed of the frame down a row of holes in the “dipping board” is discharged of their matches. This is done by a row of pins placed horizontally
105 in a plate which vibrates to and from the board, in such manner that whenever the board stops these pins advance and striking matches thrust them out, these pins entering the holes and retreating in time to get clear
of the board before the next feed. The pin plate is at (*k*) Fig. III, with the pins at
110 (*k'*). The thrust forward is given by a second cross-armed cam (*q*) placed at right angles to (*p*). This cam strikes the friction roller (*k''*) and drives it far enough to push

the pins through the holes in the board, the plate (*k*) being drawn back by springs. The arms of these cams are at right angles so that the action of one shall precede the other, viz. first (*p*) acts to let down the board, then (*q*) acts to thrust out the matches. As the matches are discharged they are caught upon a table placed in front of the frame and "dipping board" as seen at (*r*). The sides are raised, thus forming a kind of trough through the bottom of which, at (*r'*), a square hole is cut of the size of a match box, and through which hole the matches fall into the box held beneath. As the matches are spread over a considerable space as they fall from the board, they must be gathered together and brought to the delivery hole aforesaid. This is accomplished by two blocks fitting in the trough, a block at either end, as seen at (*s*). After the matches have fallen upon the table, these blocks approach and meet at the center over the delivery hole, driving before them all the matches lying on the floor (*r*) which accordingly drop through (*r'*). These movements are effected by the two cams (*t*) striking a pair of levers (*u*) to which the driving blocks are attached as clearly seen in Fig. III, the levers being drawn back, after the cams have passed, by springs, as shown. These cams only act once during a revolution of the shaft, whereas (*p*) and (*q*) act twice. Thus the matches from two rows of holes are discharged upon the table before the blocks (*s*) drive them into the box, it requiring two such rows to constitute a box of matches.

The operation is as follows: A "dipping board" is first placed in the frame (*b*) and rotary motion being given, the pawls (*i* and

i') are engaged, when the board begins to feed down by the means before described. An attendant stands at the end of the machine where the matches are delivered and holds an empty box under the hole (*r'*) until the discharge of matches takes place. He then removes it, puts on the cover and applies another, the speed of the machine being such as to allow time for this. When the whole board has been fed down and emptied he disengages the pawls and allows the frame to be drawn up by the counterweight (*d*). The disengagement is effected with the foot by striking a rod (*v*) attached to the pawl (*i*); this being thrown out strikes against the other pawl and disengages that also, and immediately the frame rises up. The empty "board" is now lifted out, and a full one returned in its place, the attendant keeping his foot against (*t*) until the full "board" is in place. He then takes a box and puts it under the delivery hole and lets the feed go on by engaging on the pawl again, and so on.

I claim as of my invention in packing matches into boxes automatically,

1. The method of feeding the "dipping board," in connection with the operation of the discharging pin specifically as described.

2. And I also claim the receiving table with its gathering and delivering blocks in combination with the aforesaid means for conveying and discharging the matches from the "dipping boards," the whole being constructed and operating specifically as herein set forth.

THOMAS COOK.

Witnesses:

J. P. IIRSSON,
S. H. MAYNARD.