

[125.]

McClintock Young's,
Machine for Making Matches, or Match-^{2 Sheets - Sheet 1.} Spindles.

No. 118,502.

Patented Aug. 29, 1871.

Fig. 1.

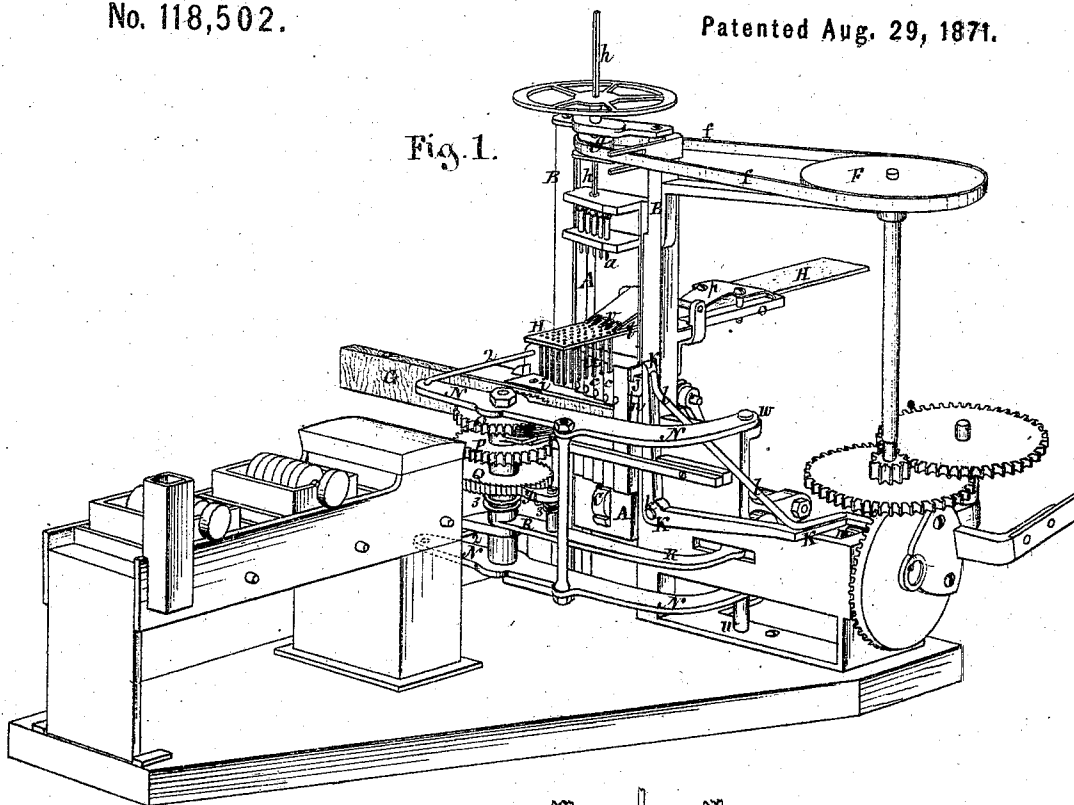
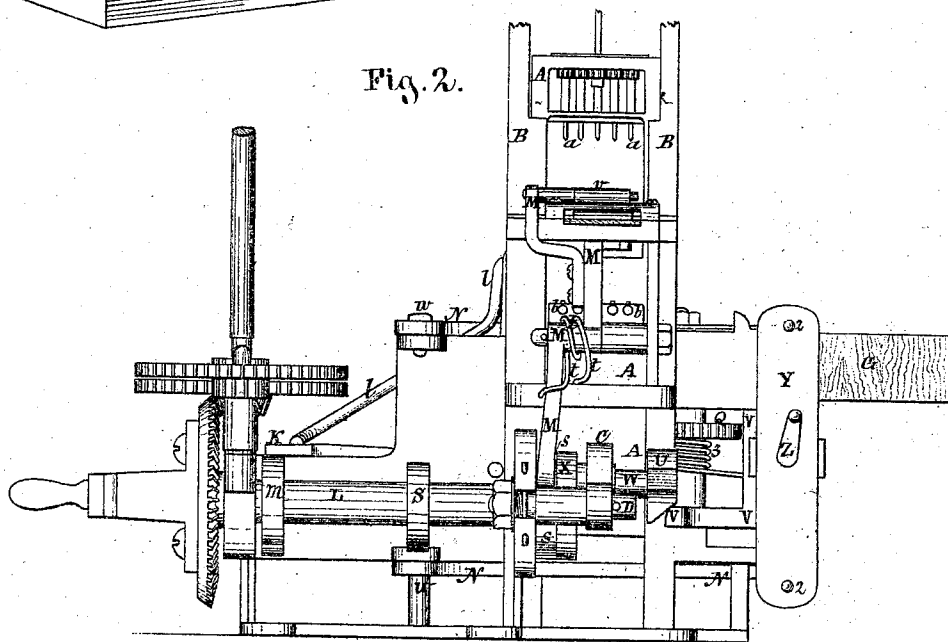


Fig. 2.



Witnesses.

W. H. Henderson
Edmund Mason

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McCLINTOCK YOUNG.

Improvement in Match-Machines.

No. 118,502.

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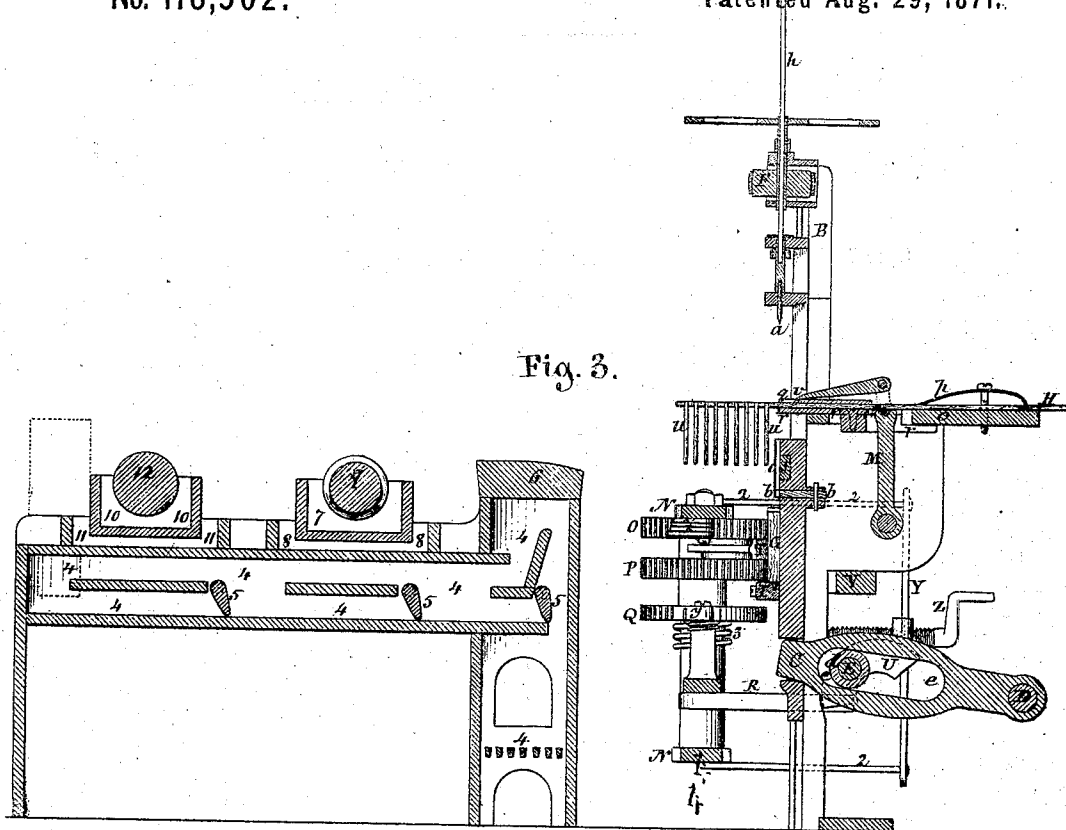


Fig. 3.

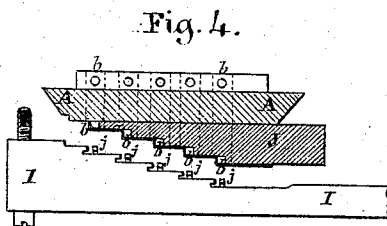


Fig. 4.

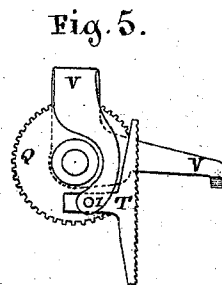


Fig. 5.

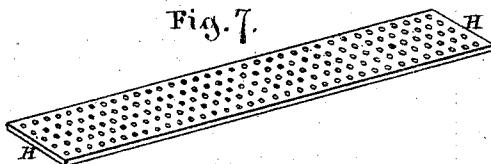


Fig. 7.

Fig. 6.



Witnesses.

H. G. Henderson
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UNITED STATES PATENT OFFICE.

McCLINTOCK YOUNG, OF FREDERICK, MARYLAND.

IMPROVEMENT IN MACHINES FOR MAKING MATCHES.

Specification forming part of Letters Patent No. 118,502, dated August 29, 1871.

To all whom it may concern:

Be it known that I, McCLINTOCK YOUNG, of Frederick, in the county of Frederick and State of Maryland, have invented certain new and useful Improvements in Machines for Making Matches, or Match-Splints or Sticks; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 represents a perspective view of the machine. Fig. 2 represents a rear elevation of the machine. Fig. 3 represents a section through the machine. Figs. 4, 5, 6, and 7 represent detached portions of the machine not distinctly seen in the other figures.

Similar letters of reference where they occur in the separate figures denote like parts in the drawing.

My machine has for its object the cutting of match-splints or sticks from blocks of wood and setting them into a back or strip of wood or other material, which may be bored during the operation of cutting off the splints, or previously, and fed up so as to receive the splints automatically in its bored holes. The match-splints so set in the back or strip are sufficiently distant from each other, though cut from the block in contact with each other—so much so as to use up the whole block—as to admit of their being dipped into the igniting composition without sticking or clogging the ends of the matches together. The matches so made may be ejected from their back or strip and be packed as loose matches, or the back may be cut up into convenient lengths and the matches packed and sold as block-matches. In this latter plan there is much economy in the saving of wood from which the match-splints are cut, which must be of a superior quality, as the back may be of an inferior quality of wood, and consequently cheaper. But whether the matches be sold as loose or block-matches, the great advantage of the back consists in holding the matches in suitable manner for dipping them into the composition. Such being the object and purpose of my invention, the invention may be said to consist in a machine that will cut and stick match-splints into a back, and, of course, automatically perform all the necessary mechanical operations to completely accomplish this purpose and object, and which will be now explained.

In a gate or frame, A, which is caused to move up and down in guides or ways B by means of a cam-tappet, C, are arranged a series of boring-bits, *a*, and a series of cutters, *b*. The tappet C is pivoted to a shaft, D, and is vibrated by means of an eccentric, *d*, on the main driving-shaft E, which eccentric works in the opening *e* in said tappet. The point of the tappet C, as shown at Figs. 1 and 3, need not be permanently attached to the gate A, but simply passes into or through a recess or opening, and so moves the gate up and down. The boring-bits *a a a*, &c., are all geared together so as to be simultaneously and rapidly revolved by a belt, *f*, passing around a pulley, *g*, on the shaft *h*, and around a larger pulley, F, driven from gears and pinions, as shown in the drawing, or in any other suitable way. The cutters *b* may be made as shown in Fig. 6, and are arranged in the gate A, as shown by the dotted lines in Figs. 3 and 4. The cutters are made of a rectangular form, so as to cut a similarly-shaped splint or stick from the strip of wood G, and thus use up the entire strip. Above the cutters are rectangular guides *c c*, one for each cutter, and arranged in immediate proximity each to its cutter, so that as the sticks or splints are cut from the block or strip they will enter their guides and be there held until carried up and stuck in a back, H, that is bored with suitable holes for that purpose, either by the bits *a*, as it is fed along, or previously bored, as shown in Fig. 7, and fed along to receive the sticks or splints as they are cut and carried up to said back. The cutters and guides, as also the boring-bits, are set oblique to the line of feed of the strip or block G, by which means the sticks or splints are cut off from said strip in steps, and this admits of using up the whole of the wood, while at the same time the splints are sufficiently separated and stuck in the back H at sufficient distance apart to dip them in the composition without clogging or sticking together. Instead, however, of arranging the cutters, guides, and bits in a line oblique to the feed of the strip they may be arranged in a right line and the strip fed up in an oblique line, the object being to cut the splints from steps in the strip, and for the purpose above mentioned. The cutters and guides being arranged in steps, as shown in Figs. 1 and 4, a metal plate, *i*, similarly stepped, is attached to the main frame, which serves as a guide for the cutters and carriers above the block G, and

below this stepped plate, and underneath the block or strip G, there is another similarly-stepped plate, I, which has upon it (more distinctly seen in Fig. 4) a series of projections, *j j*, that enters the knives as they come down and causes the splints to be cut entirely off from the block G, and without carrying them in any degree beyond the edge of said block from which they are cut, said projections being a permanent fixture, catching and holding the splints while the knives descend further. The splints thus cut off from the block or strip G pass into their respective guides *c c*, &c., and, by the action of the machine, are clamped therein so as to be held with sufficient firmness to be carried up and stuck into the back H, after which they are released and the gate or frame of knives descends for another operation. This clamping is done as follows: J, Fig. 4, is a movable piece, the recesses or steps of which form two sides respectively of each of the guides *c c*. A bell-crank, K, pivoted to the frame at *k* and braced as at *l*, bears with its vertical arm against the clamping-piece J, and its other arm extends to and is operated by a cam, *m*, on the main driving-shaft L, said cam being so timed as to clamp the splints in the guides as they are coming up to the back H and holding them until they are stuck in said back, and then releasing the bell-crank when said clamp is moved back to release the splints by the reaction of the spring *n*. The back H is laid upon the table *o*, and is held thereto by a spring, *p*, and passes, near to where the bits operate upon it, under a fingered holder, *q*. A portion of this bed or table, as shown at *r*, is moved forward by means of the pivoted arm M, which is operated through a cam, *s*, on the main shaft, to feed forward the back H, and after feeding said back it is returned for another feeding operation by the reaction of the spring *t*. The fingers upon this feeding-plate *r* take against the splints *u* set in the back, and, by their contact therewith, push the back far enough forward to receive the next series of holes for the next series of match-splints. The cam *s* is so timed as that the feeding-plate will first move out far enough to catch against the match-splints, and, by pressure, hold them while the gate, cutters, and guides descend to cut off another series of splints, and, as the gate descends, the series of splints just stuck in the back leaves the guides *c*, and when the splints are clear of the guides then the feeding-points or plate *r* feeds the back along far enough for the succeeding series of holes, and returns to be ready for the next holding and feeding operation. If, however, the back H be bored first, as shown at Fig. 7, or in a separate machine, then it is or may be fed along by the fingers *v* taking into the tiers of holes and pushing the back along in that way, said fingers being operated, as the above-described feeding-plate *r* is, by the cam and lever, as above described. The feeding in of the block or strip G, from which the splints are cut, requires that said strip should be very rigidly held when the splints are being cut, very readily and accurately fed up to the cutters, and prevented from running with the grain of the wood in being cut, which would prevent

the splints from entering the guides or being clamped therein, and be destructive to the wood and make irregular splints. To accomplish the purpose and avoid the difficulties I arrange as follows: In a frame, N, pivoted to the main frame at *w*, are hung two feeding-wheels, O P, one bearing against the upper and the other against the lower portion of the strip of wood G, so as to hold said strip close against a fence, *x*, and to feed it along also under the cutters. Upon the same shaft with these pressure feeding-wheels O P there is a ratchet-wheel, Q, into which a pawl, *y*, attached to an arm, R, works, said arm being moved slightly around its center of motion by a cam, S, on the main shaft L, and through this arrangement working the feed-wheels. Holding-pawls Z take against the feed-wheel O to prevent any backlash. Between the wheels O P there is arranged a clamping-foot, T, Fig. 5, which foot, though hung in the frame N, is operated by an independent cam, U, though on the same shaft with the cam S, and through the arm V or frame V, to which said presser-foot T, as seen in Fig. 5, is pivoted, as at *l*. The cam U turns with the main shaft L, but it is really placed on an arm or wrist, W, eccentrically set in a wrist-wheel, X, on said main shaft L. The feed-wheels O P and the presser-foot T are so operated that, when the former come up to the strip to feed it along, the presser-foot is released from said strip, and when the feed has taken place then the presser-foot comes up tight against the strip and the feed-wheels recede. The frame N, that carries the feed-wheels, ratchet-wheel, and presser-foot and its frame, pivoted at one end, as above described, has attached to it at its free end rods 2 2, which are attached to a spring clamping-bar, Y, at the back of the machine, and in this clamping-bar Y there is a crank screw-shaft Z, the point of which bears against the main frame of the machine, so that by it said frame N and its connected devices may be adjusted to the block or strip of wood to properly feed and hold it without too much or too little friction. Springs 3 are used for holding certain moving parts to the mechanism which operates them. Such springs are, however, common in other machines, and need not be described.

I have shown, in connection with the machine I have devised and above described, an apparatus for first slightly singeing or burning the points of the match-sticks or splints as the back in which they are stuck is fed along, and, secondly, an apparatus for putting on the composition used for such purpose upon the ends of the splints and completing the matches. This apparatus consists in a heating-furnace and flues, 4, with suitable dampers 5 to regulate the heat. At the front of this furnace is a singeing or charring-plate, 6, over which the points of the splints pass, and, in so doing, are slightly burned or dried. Next there is a vat, 7, which is set in a sand-bath, 8, said vat containing the usual composition first applied to matches, and in this vat there is a roll, 9, grooved or otherwise, for carrying up the composition, so that the match-sticks, as they pass, will take a portion of it. Next, a similar vat, 10,

sand-bath 11, and roll 12 for containing and carrying up and delivering to the passing match-sticks the finishing composition. When the matches are thus finished they may be knocked out of the back H and be packed as loose matches, or the back may be cut up into suitable lengths and the matches put together comb-fashion and so packed and sold, which latter are known as block-matches. Instead of a clamping-bar, J, I may use a plate or other device to close the bottoms of the knives and allow the splints to rest thereon unclamped, yet positively held in the guides; and, instead of feeding-wheels O P, I can use a feeding-bar that will afford more clamping-surface on the block or strip, said bar to move with the block, but of course both to be relieved when the feed is to take place. What I have called a bored back or strip, H, may be a frame of any kind, and though I prefer it made of wood, it may be made of metal, paper-board, or any other material of proper strength.

Having thus fully described my invention, what I claim is—

1. The arrangement of a series of spaced cutters in a receding line for cutting off match-splints from a block of wood in steps, as and for the purpose herein described and represented.

2. In combination with a series of receding cutters and guides for cutting, receiving, and carrying match-splints, a traveling, clamping, or holding-bar that continues to hold the splints in the guides while it moves with said cutters and guides, substantially as described.

3. In combination with a series of cutters and receiving and carrying-guides arranged in a receding line, and with splints firmly supported in said guides, a bored strip or back for receiving and holding said splints in an oblique line without moving either block, splints, cutters, guide, or bored back in a lateral direction, substantially as described and represented.

4. In combination with a series of knives for cutting off match-splints from a block or strip of wood, a series of points or projections on the plate *i* for entering the cutters and holding the splints therein and preventing them from being carried beyond the block from which they are cut, substantially as described.

5. In combination with the top and bottom stationary guides, an adjustable frame for carrying the feeding-wheels and presser-foot, as herein set forth, so that pressure may be applied to the block to firmly hold it against the action of the cutters and then removed when the block is to be fed along for the next cut, substantially as described.

6. In combination with the series of receding cutters and guides or carriers herein described, the top and bottom receding bearing-plates *i* and *I*, substantially as described.

7. The cutters, constructed as herein described—that is to say, made of short rods or bars with a square transverse opening through them near one end, and with two cutting-edges filed or ground thereon, as shown and described.

8. In combination with a match-machine in which a bored back is used to receive the splints cut off by it, a feeding-pawl that acts directly against the splints stuck therein or the holes therefor, and thus feeds the back along without the use of real ratchets, frames, or guides, substantially as described.

9. Block-matches, made of separate splints stuck in a previously-bored strip, back, or frame, from which they may be drawn or broken off as used, substantially as described.

McCLINTOCK YOUNG.

Witnesses:

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EDMUND MASSON.