No. 606,648. Patented July 5, 1898.

F. A. DEBIZE & L. F. CHASSEIGNE.

MANUFACTURE OF WOODEN MATCHES.

(Application filed Dec. 23, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 3.

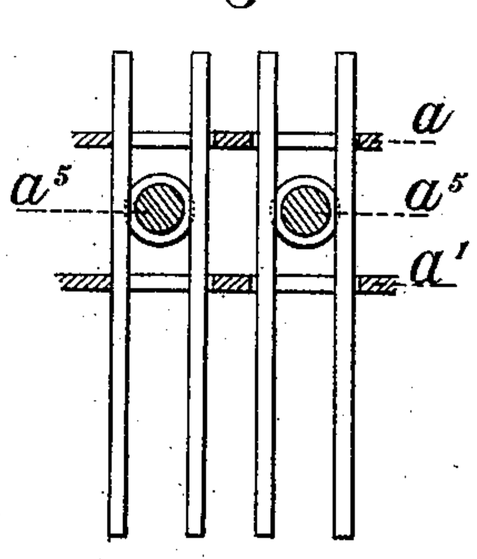


Fig. 4

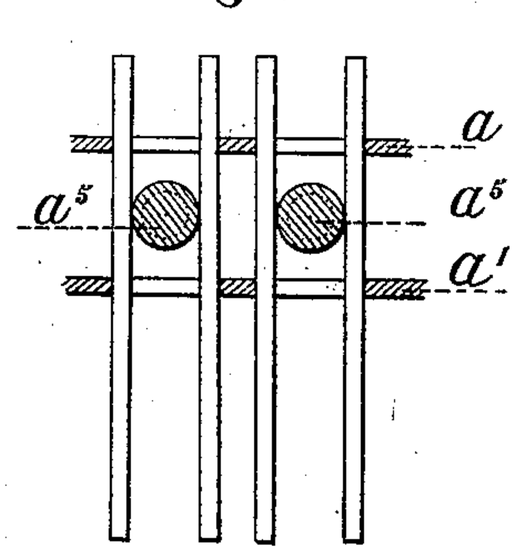


Fig. 2.

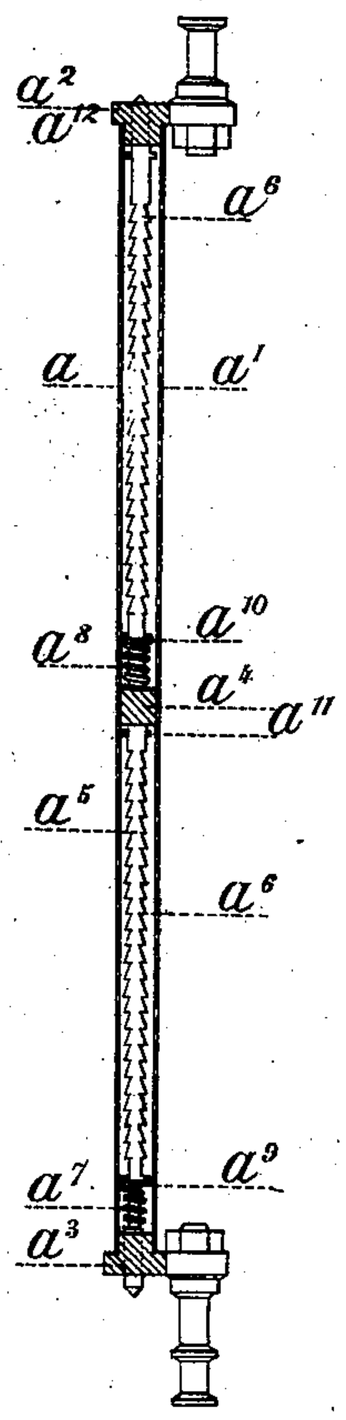
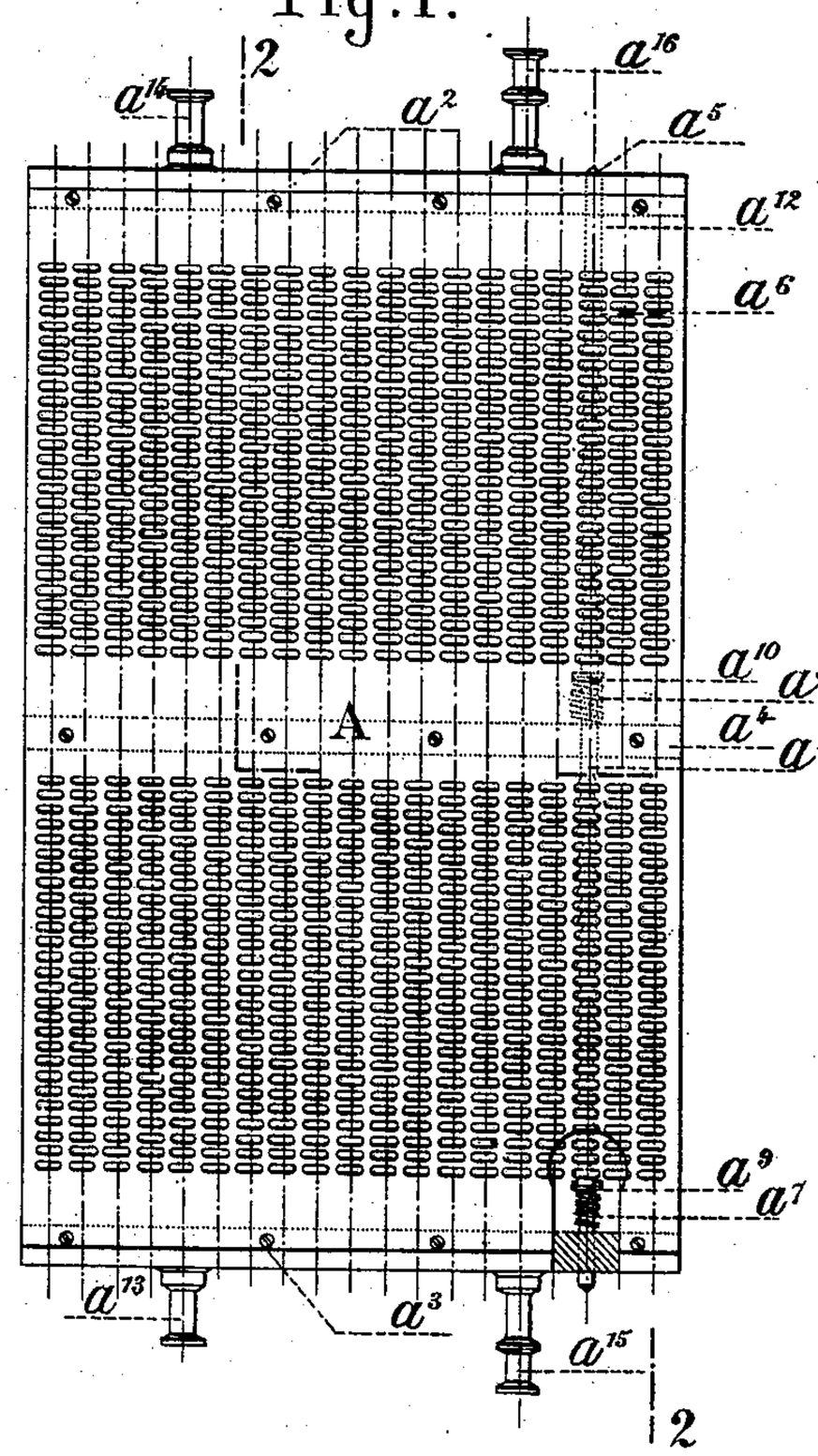


Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 6.

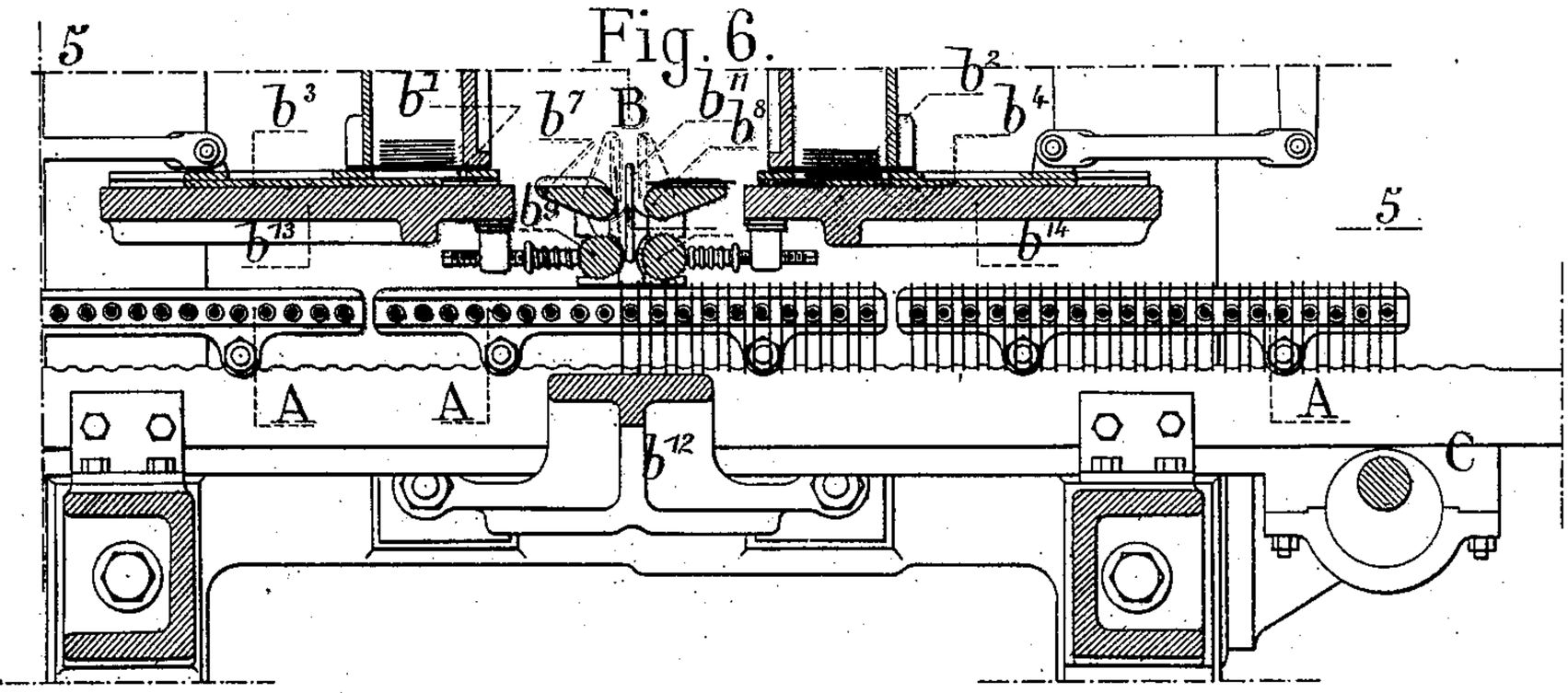
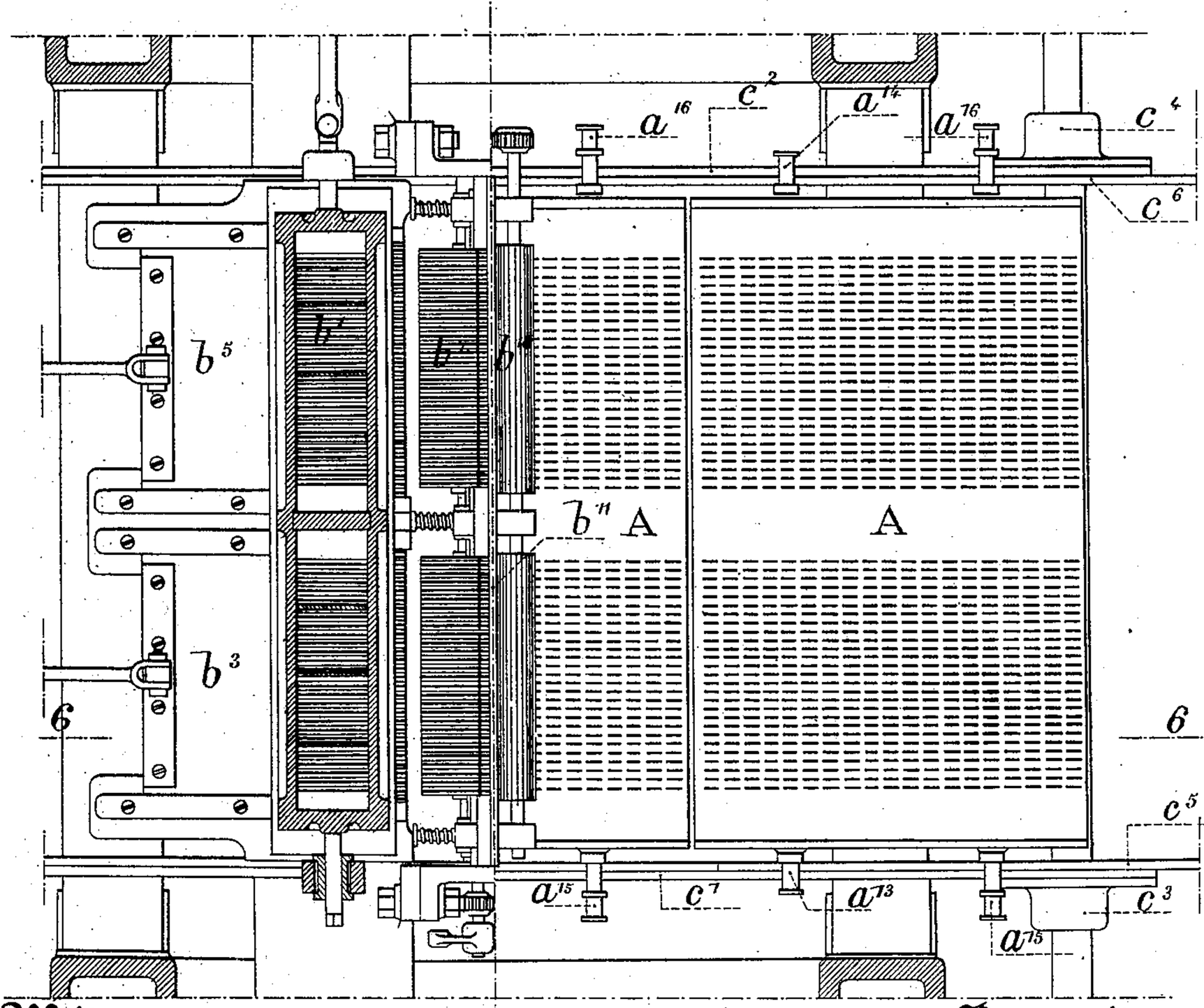


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANÇOIS ALPHONSE DEBIZE AND LOUIS FIRMIN CHASSEIGNE, OF PARIS, FRANCE.

MANUFACTURE OF WOODEN MATCHES.

SPECIFICATION forming part of Letters Patent No. 606,648, dated July 5, 1898.

Application filed December 23, 1897. Serial No. 663,155. (No model.) Patented in France December 24, 1896, No. 262,504.

To all whom it may concern:

Be it known that we, FRANÇOIS ALPHONSE DEBIZE and LOUIS FIRMIN CHASSEIGNE, citizens of the Republic of France, residing at Paris, France, have invented certain new and useful Improvements in Machinery for Making Matches, (for which we have obtained French Letters Patent No. 262,504, dated December 24, 1896,) of which the following is a specification.

Our invention has relation to a machine for the continuous manufacture of wooden matches, and in such connection it relates to the construction and arrangement of such a machine.

The principal object of our invention is to provide a machine wherein wooden matches may be continuously and quickly manufactured and a machine which shall possess great advantages in the placing of the matches in the press of the machine and in their support and transportation during the several operations of manufacture of the matches therein.

Our invention consists, essentially, of a press adapted to receive the match-splints, keep them in proper position, remove them from the filling mechanism, and transport them to the other mechanism necessary for their completion, the said press comprising two plates similarly perforated and having the perforations registering, said plates being immovably connected by two end pieces and a cross-bar traversed by a series of fluted rods or cylinders which are permitted to move longitudinally in one direction to receive the match-splints and in the other direction to hold said splints in position in the press, and, second, of fixed grids adapted to receive the match-splints, pushers adapted to feed the splints on the grids, tipping blocks arranged adjacent to the grids and provided with grooves adapted to receive the splints as they are pushed on the grids, said tipping blocks adapted to tilt into vertical direction, feeding-rollers arranged below the blocks and adapted to propel the splints from the blocks when the same are in a vertical position, and a fixed grooved partition arranged between the tilting blocks and above the feeding-rollers; and our invention further consists of a machine for manufacturing wooden matches, constructed and arranged in substantially the manner hereinafter described and claimed.

The nature and scope of our invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part thereof, in which—

Figure 1 is a top or plan view of the press for the match-splints. Fig. 2 is a transverse section on the line 2 2 of Fig. 1. Figs. 3 and 4 are detailed sections, enlarged, showing, respectively, the position assumed by the fluted rods or cylinders when the match-splints are released from and held in the press. Fig. 5 is a plan view, partly in section, illustrating the mechanism for feeding the splints to the press; and Fig. 6 is a vertical section on the line 6 6 of Fig. 5.

In the drawings each of the presses A (of which Fig. 1 shows a plan, Fig. 2 a section on the line 2 2 of Fig. 1, and Figs. 3 and 4 detail sections) is composed of two similarly-perforated plates a and a', the holes in which perfectly correspond and which are immovably united by two end pieces a^2 and a^3 and a cross-bar a^4. These end pieces and cross-bar are traversed by a series of fluted cylinders a^5, located between the two plates and which slightly project beyond the said end pieces. These cylinders, whose ends are conical, carry flutings a^6 a^6 a^6, equal in number to the holes pierced on a same line in the plates. Spiral springs a^7 a^8, placed upon the fluted cylinders, bear one side against collars a^9 a^{10} and the other side against one of the end pieces or against the cross-bar. Longitudinal displacement of the cylinders is limited by pins a^{11} a^{12}.

Studs a^{13} a^{14} a^{15} a^{16}, fixed upon the end pieces, are for the purpose of transporting the presses by means of apparatus which will be further described.

To introduce the match-splints into the presses, we bring by a longitudinal displacement of the fluted cylinders the hollows of the flutings a^6 of these cylinders opposite the perforations in the plates. After introduction of the match-splints the fluted cylinders a^5 are displaced longitudinally in the reverse direction, and by that means alone the matches are pressed and held safely in the press. To empty these presses, the fluted cyl-

inders are acted upon in the same direction as for the introduction of the splints. This operation is therefore carried out very easily and allows the matches to be very rapidly packed in boxes.

The general view of this machine is shown in Fig. 5, which is a partial horizontal section on the line 5 5 of Fig. 6. Fig. 6 is a vertical section on the line 6 6 of Fig. 5.

The part B of this machine causes the separation of the match-splints and their introduction into the presses A. It is composed of, first, two fixed grids b' b^2; second, four pushers b^3 b^4 b^5 and another which does not appear; third, two movable grooved blocks b^7 b^8; fourth, propelling-rollers b^9 b^{10}; fifth, a fixed partition with grooves b^{11}.

The match-splints placed in hoppers above the fixed grids b' b^2 are shaken by these hoppers and enter by series into the spaces in these grids. The pushers b^3 b^4 b^5 b^6 push each series of splints into the grooves in the movable blocks b^7 b^8. As soon as blocks b^7 b^8 are charged with splints they are brought into the vertical position indicated by dots in Fig. 6. In this movement they take with them the splints, which also assume a vertical position and enter between the fixed partition b^{11} and the rollers b^9 and b^{10}. These rollers, to which a rapid movement of rotation is given, take the splints and cause them to enter into the holes in the press A, placed below. A table b^{12} limits the descent of the splints through the holes in the plates of the press. The tables b^{13} and b^{14} serve to support the several parts just described and guide the match-splints during their passage from the grids b' b^2 onto the blocks b^7 b^8. The spaces in the grids, the grooves in the movable blocks, and the grooves in the fixed partition, as well as the holes in the press, correspond.

The third part of this invention serves to effect the transport of the presses and to keep them at rest during the introduction of the splints. It is composed of, first, two movable notched rails c' c^2. (Partially shown in Figs. 5 and 6.) These two rails are carried at each end by two eccentrics c^3 c^4, keyed upon the same shaft, which communicates to them a continuous rotary movement. Second, two fixed notched rails c^5 c^6. The two movable rails c' c^2 have for their object to slightly raise and to cause the presses to intermittently advance through the machine in such a manner that these presses successively present each double row of holes below the splints brought forward by the part B. The fixed rails c^5 c^6 serve to support the presses by means of studs a^{13} a^{14} a^{15} a^{16} and keep them at rest during the introduction of the splints.

The notches formed both in the fixed movable rails and in which the studs a^{13} a^{14} a^{15} a^{16} of the presses are placed assure to the presses a predetermined position during their time of travel as well as during their period of rest.

It may be remarked that this machine may be employed alone or may enter into the composition of a machine for the continuous manufacture of wooden matches. In the latter case the presses A will succeed each other at regular intervals. After being charged with splints by the press-filling machine, as has just been described, they will transport the splints to the various other machines. After being freed from the finished matches they will take a fresh charge of splints from the press-filling machine.

It may be remarked that although plates pierced with oval holes are shown they may be given any suitable shape.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a machine of the character described, a press adapted to receive, maintain and transport match-splints, comprising two parallel perforated plates, the perforations of one plate registering with those of the other, end pieces immovably securing the plates in parallel relationship and a series of longitudinally-movable fluted cylinders arranged between the plates and each directly in line with the perforations in the plates, whereby when the cylinders are moved in one direction the splints may be introduced into the perforations of the plates and when moved in the opposite direction the splints are held firmly in position in said plates, substantially as and for the purposes described.

2. In a machine of the character described, a fixed grid upon which the match-splints are adapted to rest, a pusher adapted to move the splints on the grid, a movable tilting block adapted in one position to receive the splints from the grid, a fixed grooved partition arranged adjacent to the block and to which the splints are presented when the block is tilted, and a propelling or feed roller located adjacent to the partition and adapted to propel the splint from said partition, substantially as and for the purposes described.

3. In a machine of the character described, a match-press, comprising two perforated plates the perforations whereof register, means for locking match-splints in the perforations of said plates and for releasing said splints, two stationary rails provided with notches adapted to support the press in stationary position, and two movable rails adapted to move upward to raise said press from the stationary rails and to support said press, said movable rails also adapted when raised to move forward to feed the press, substantially as and for the purposes described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANÇOIS ALPHONSE DEBIZE.
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Witnesses:
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