

(No Model.)

2 Sheets—Sheet 1.

T. A. COOK & F. LABELLE.

MATCH DIPPING MACHINE.

No. 277,462.

Patented May 15, 1883.

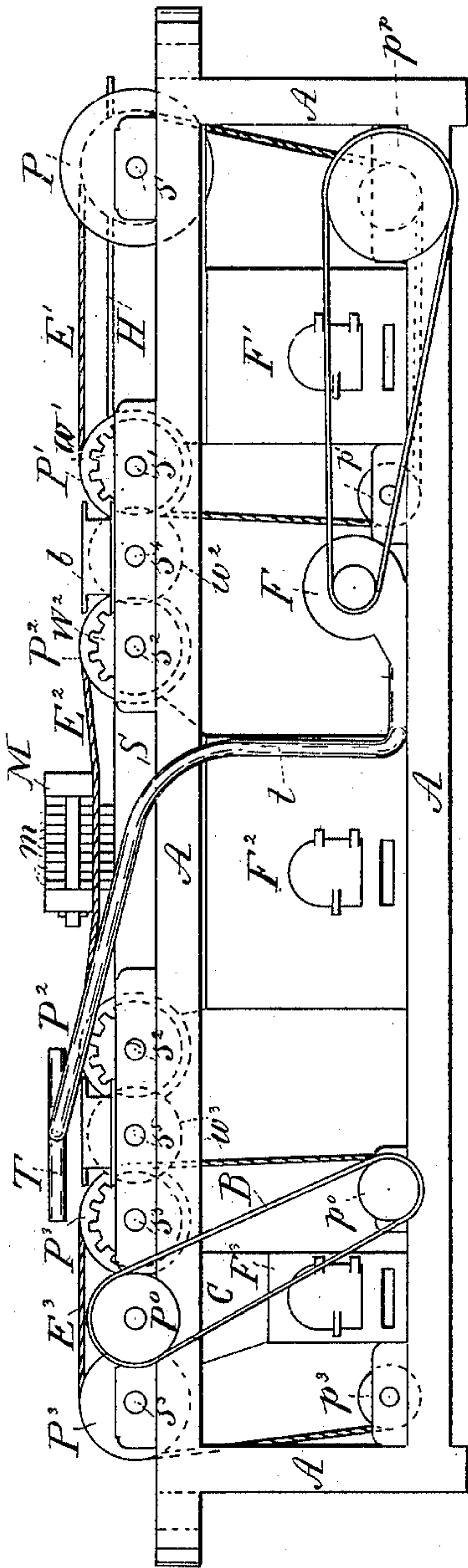


Fig. 1

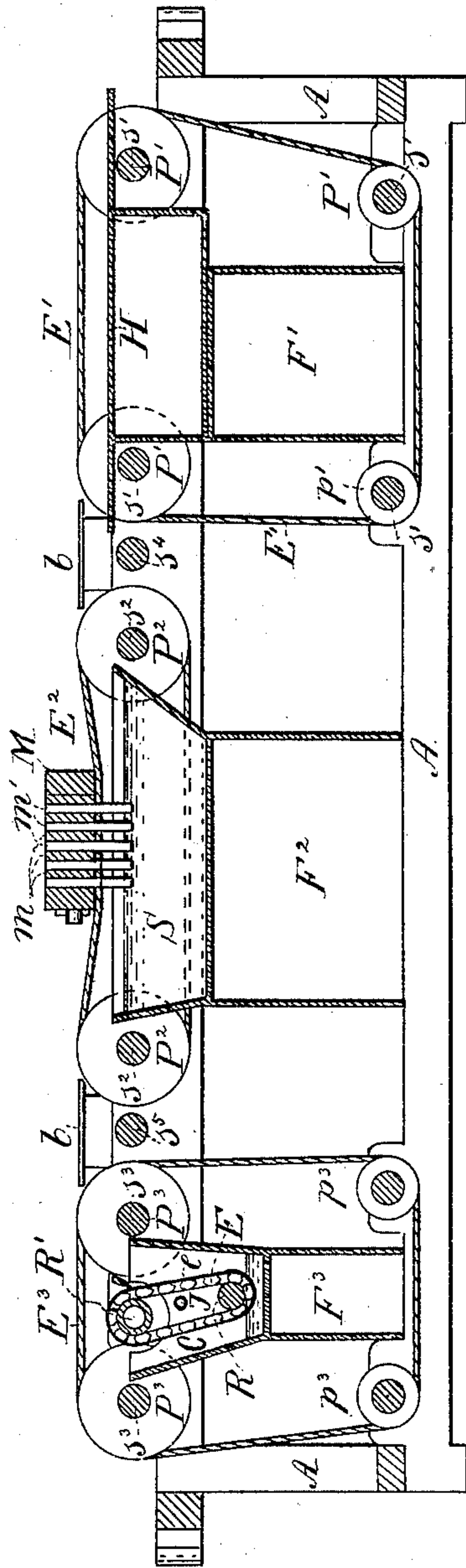


Fig. 2

Witnesses:

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(No Model.)

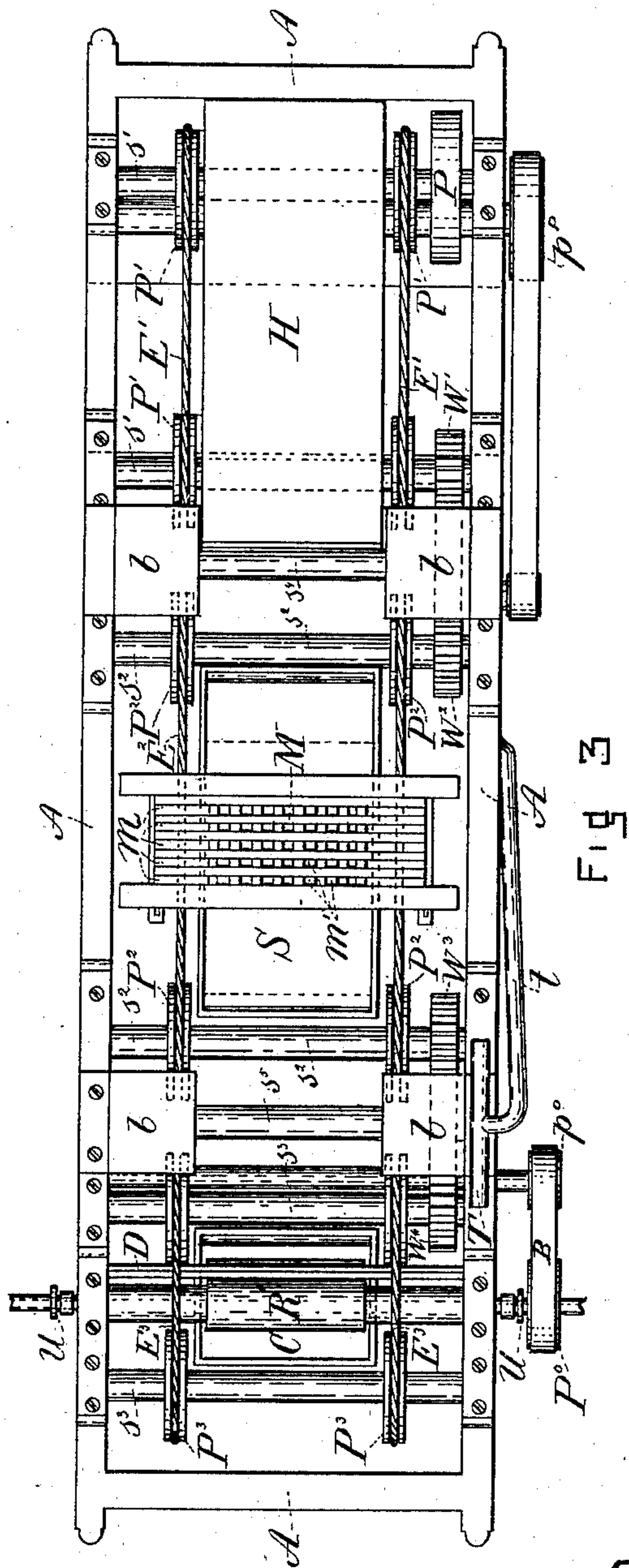
2 Sheets—Sheet 2.

T. A. COOK & F. LABELLE.

## MATCH DIPPING MACHINE.

No. 277,462.

Patented May 15, 1883.



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# UNITED STATES PATENT OFFICE.

THOMAS A. COOK, OF OTTAWA, ONTARIO, AND FELIX LABELLE, OF HULL,  
QUEBEC, CANADA.

## MATCH-DIPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 277,462, dated May 15, 1883.

Application filed November 22, 1882. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS A. COOK, of the city of Ottawa, in the Province of Ontario, and FELIX LABELLE, of Hull, in the Province of Quebec, both Provinces of Canada, have invented a new and useful Match-Dipping Machine, of which the following is a specification.

Our invention relates to machinery used in the manufacture of matches, and has for its object the construction of a machine for automatically dipping matches—that is to say, a machine for applying the sulphur and composition to the end of the match-splints after they have been cut and placed in racks.

Figure 1 is a front elevation of our new machine. Fig. 2 is a longitudinal section of the same, and Fig. 3 is a top view or plan.

Our machine consists, essentially, of a suitable frame-work, to which the various parts of the machine are secured, and its principal parts are a furnace with hot-plate to dry and heat the ends of the splints to be dipped, a trough containing liquid sulphur, also placed on a furnace to keep it hot, and, lastly, a trough or receptacle containing the composition. Endless chains or bands are mounted upon suitable pulleys or rollers to carry the match-racks along and through the various processes.

A is the frame of the machine.

F<sup>1</sup> is an ordinary furnace for heating the hot-plate H, placed on it and near the upper surface of the machine. F<sup>2</sup> is another furnace, upon which the sulphur-trough S is placed to keep the sulphur contained in it hot and in a liquid condition. F<sup>3</sup> is still another furnace, on which is placed a trough or receptacle, C, containing what is known as the "composition."

P<sup>1</sup> p<sup>1</sup> P<sup>2</sup> P<sup>3</sup> p<sup>3</sup> are three sets of pulleys, mounted upon suitable shafts, s<sup>1</sup> s<sup>2</sup> s<sup>3</sup>, over which run the endless chains or bands E<sup>1</sup> E<sup>2</sup> E<sup>3</sup>, which carry the match-racks along the machine. Each set of rollers is geared to the adjacent set by means of spur-wheels having an intermediate carrier between them, in order to obtain the right direction of the movements of the chains or bands.

W<sup>1</sup> is a spur-wheel mounted upon the shafts s<sup>1</sup> of the last pair of the first set of pulleys, P, gearing into the carrier-wheel w<sup>2</sup>, mounted

upon the shaft s<sup>4</sup>, and imparting motion to the spur-wheel W<sup>2</sup>, mounted upon the shafts s<sup>2</sup> of the first pair of pulleys in the set P<sup>2</sup>. Upon the shaft s<sup>2</sup>, carrying the last pair in the second set of pulleys, P<sup>2</sup>, is mounted the spur-wheel W<sup>3</sup>, imparting motion to the first pair in the third set of pulleys, P<sup>3</sup>, by means of the carrier-wheel w<sup>3</sup>, mounted upon a shaft, s<sup>5</sup>, all the shafts being mounted in suitable bearings. The faces of the pulleys P<sup>1</sup> P<sup>2</sup> P<sup>3</sup> are suitably prepared for bands or chains, as the case may be. The spaces occurring between adjacent pairs of pulleys belonging to different sets are bridged over in a line with the chains or bands E<sup>1</sup> E<sup>2</sup> E<sup>3</sup> by the plates b. The racks are passed over the plates b by the action of each on the one in advance, forcing the same ahead.

P is the driving-pulley, by means of which motion is imparted to the pulleys P<sup>1</sup> P<sup>2</sup> P<sup>3</sup> and endless bands E<sup>1</sup> E<sup>2</sup> E<sup>3</sup>.

The composition-trough C is provided near its bottom with a roller, R, nearly or wholly immersed in the composition, its journals being provided, if necessary, with suitable stuffing-boxes. A cylinder, R', is mounted near the top of the trough. This cylinder is heated by steam, being of suitable construction for this purpose, and having its journals made hollow, and running in suitable glands or stuffing-boxes, U, for the entrance and exhaust of the steam. It receives motion by means of a driving-pulley, P<sup>0</sup>, and belt B, driven from some convenient point, such as the pulley p<sup>0</sup>. On this cylinder R' and roller R is mounted a pair of endless chains, E, to which an endless apron, e, consisting of a suitable material—such as thin sheet metal—is secured in such a manner that the said apron does not touch the surface of the cylinder and roller, being attached to that edge or face of the chain opposite to that which is in contact with the surface of the cylinder and roller. In close proximity to the uppermost portion of the apron e a small steam-jet, J, is placed, for the purpose of keeping such portion of it as is not immersed in the composition moist when the machine is stopped, to prevent it from firing on restarting the machine.

F is a fan driven by a belt from a suitable point, such as the pulley p<sup>0</sup>. The blast pro-



duced by this fan is conducted through suitable tubing, *t*, to a distributor, T, provided with suitable perforations, and so placed as to play upon the ends of the match-splints that have been dipped in the sulphur during their passage from the sulphur-pan S to the composition-trough C.

M is the rack containing the match-splints, consisting of cross-grooved plates *m*, wedged in a suitable frame, and holding the match-splints *m'* at one end, so as to project at the other.

The machine operates as follows: The rack M is placed upon the hot-plate H, so that the ends of the frame M rest upon the endless chains or bands E', which, being set in motion, will carry the same and any other number of racks that may be successively placed there along the machine, first over the hot-plate, where the ends of the match-splints *m'* are well dried and heated, ready to receive the sulphur, into which they are dipped after leaving the hot-plate, the slack of the chains E<sup>2</sup> allowing the rack M to sag sufficiently for that purpose. On passing from the sulphur-pan they are exposed to the air-blast from the distributor T, and finally pass over the surface of the apron *e*, which, dipping into and being charged with composition, applies the same to the ends of the match-splints, and thus completes the matches, the racks containing them being then removed from the machine.

We claim as our invention—

1. In a match-machine, the combination of a furnace and a naked or exposed drying-plate heated thereby, a second furnace provided with a sulphur-pan, a third furnace provided with a composition-pan and mechanism for delivering the composition, and means, substantially as described, adapted to convey the match-trays over the drying-plate, the sulphur-pan, and the composition-pan, successively, whereby the splints may be successively dried, dipped in sulphur, and dipped in the igniting compound, and the heat graduated in each of the furnaces independently of the others, as required.

2. The combination of a frame, A, furnaces F' F<sup>2</sup> F<sup>3</sup>, hot-plate H, sulphur-pan S, composition-trough C, roller R, cylinder R', apron *e*, sets of pulleys P' P<sup>2</sup> P<sup>3</sup>, spur-wheels and carriers W' W<sup>2</sup> W<sup>3</sup> W<sup>4</sup> *w'* *w*<sup>2</sup>, endless bands or chains E' E<sup>2</sup> E<sup>3</sup>, steam-jet J, and fan F, with tubes and distributor T.

3. In combination with a match-dipping machine, a steam-heated cylinder, R', and roller R, upon which is mounted an endless apron, *e*, dipping into the composition, and secured to an endless chain, E, by which the apron is kept off the surface of the cylinder and roller, the cylinder and roller suitably journaled in the composition-trough.

4. In combination with the composition-applying mechanism of a match-dipping machine, a steam-jet, J, for the purpose of keeping moist those parts not immersed in the composition during the time the machine is stopped.

5. In combination with a match-dipping machine, a fan, F, tubing *t*, and perforated distributor T, for the purpose of playing upon and cooling the match-splints after being dipped in sulphur.

6. In a match-machine, the combination of a tray or vat to receive the composition, an endless apron acting therein, and a hollow steam-heated roll sustaining said apron, as described and shown.

7. The combination of the following elements: a drying-furnace, a composition-pan, an air-delivery device, a composition-furnace provided with delivery mechanism, and conveyers, substantially as described, for automatically delivering the match-frame to said mechanisms in the order named.

8. In a match-machine, the combination, of a drying-furnace, a sulphur-pan, and composition-pan with the three pairs of endless belts and the intervening plates, *b*, whereby the matches are presented to the three furnaces in succession.

9. In combination with the sulphur-pan, the composition-pan, and the mechanism for transferring the splints from one to the other, the air-blast mechanism, arranged to deliver a blast upon the matches between the two pans, all substantially as described and shown, and for the purpose set forth.

Signed at Ottawa, Ontario, this 14th day of October, A. D. 1882.

T. A. COOK.  
F. LABELLE.

In presence of—

J. COURSOLLE,  
L. H. OLIVIER.