

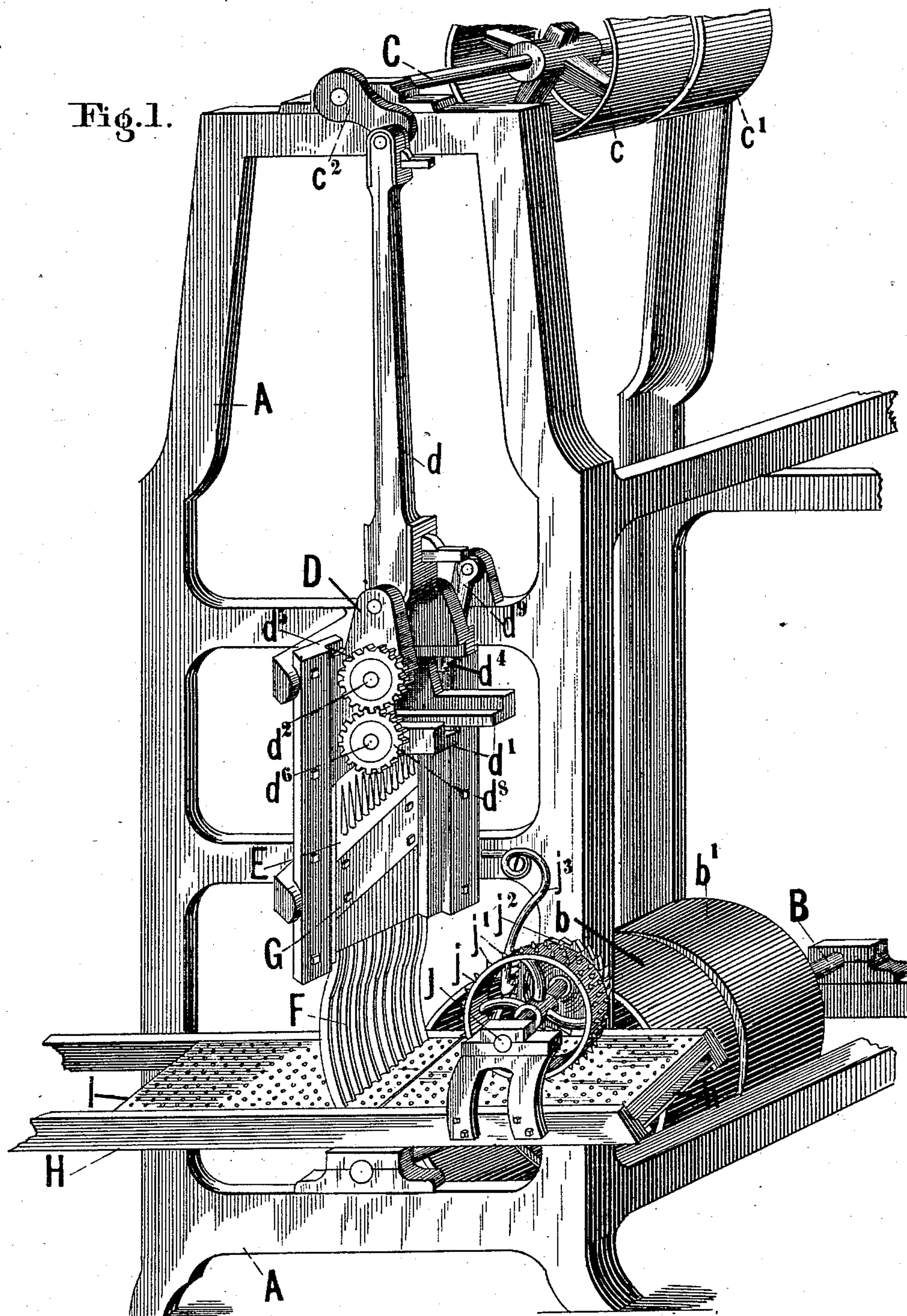
(No Model.)

3 Sheets—Sheet 1.

G. H. MILLEN.
MATCH SPLINT MACHINE.

No. 281,778.

Patented July 24, 1883.



WITNESSES:

Fred. L. Dieterich
J. G. Hunkel

INVENTOR.

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H. W. Beadle & Co.
ATTORNEYS.

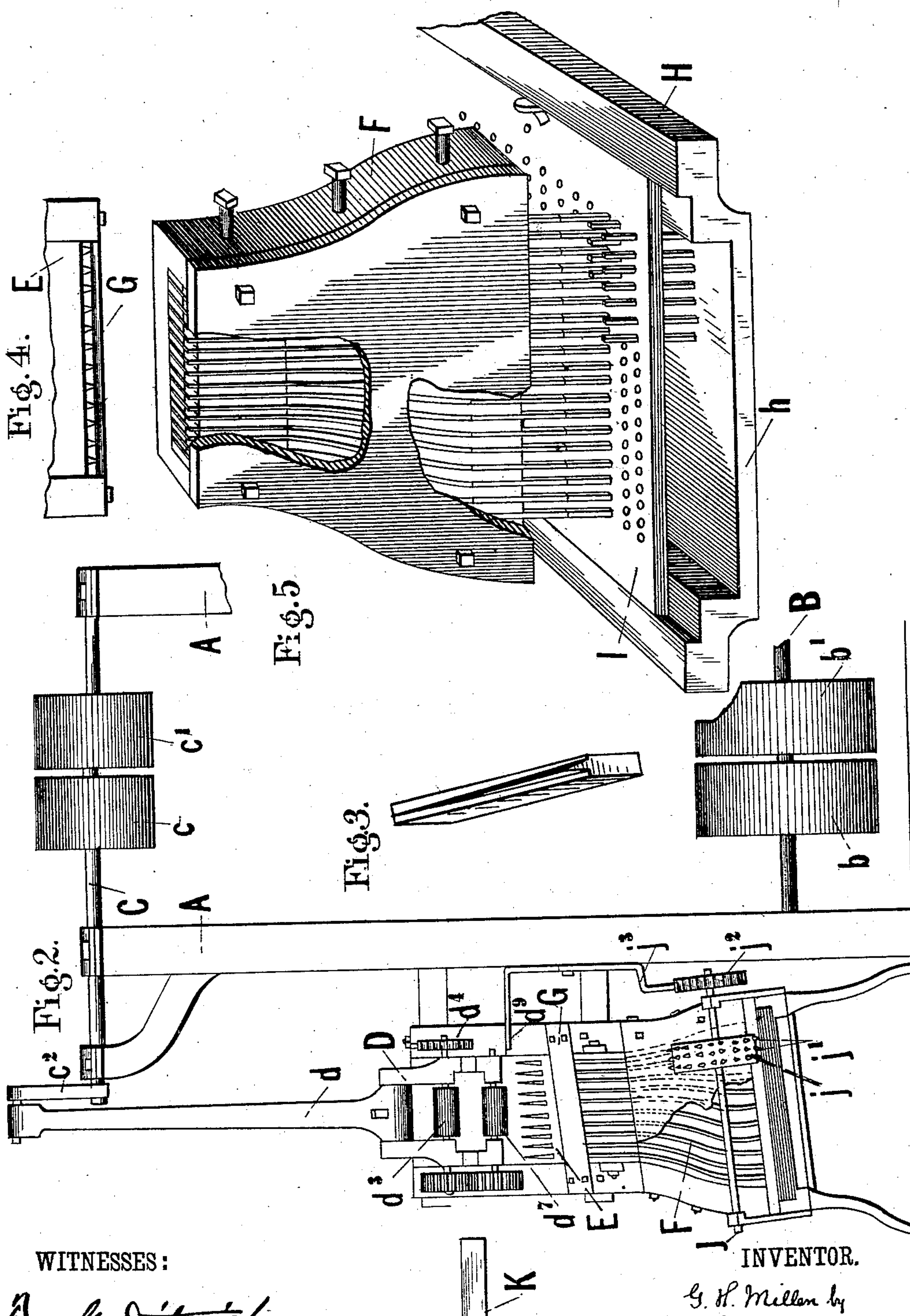
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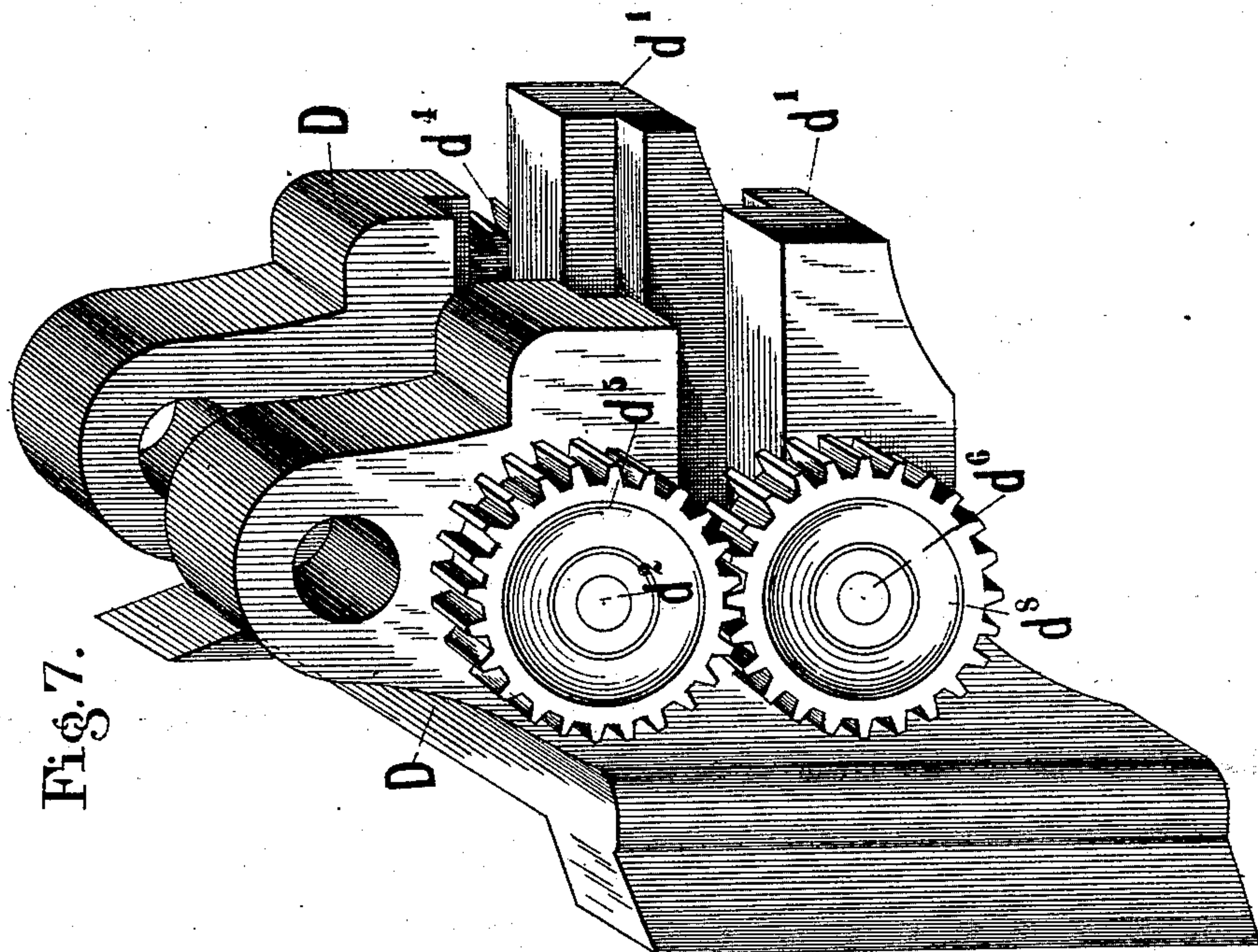


Fig. 7.

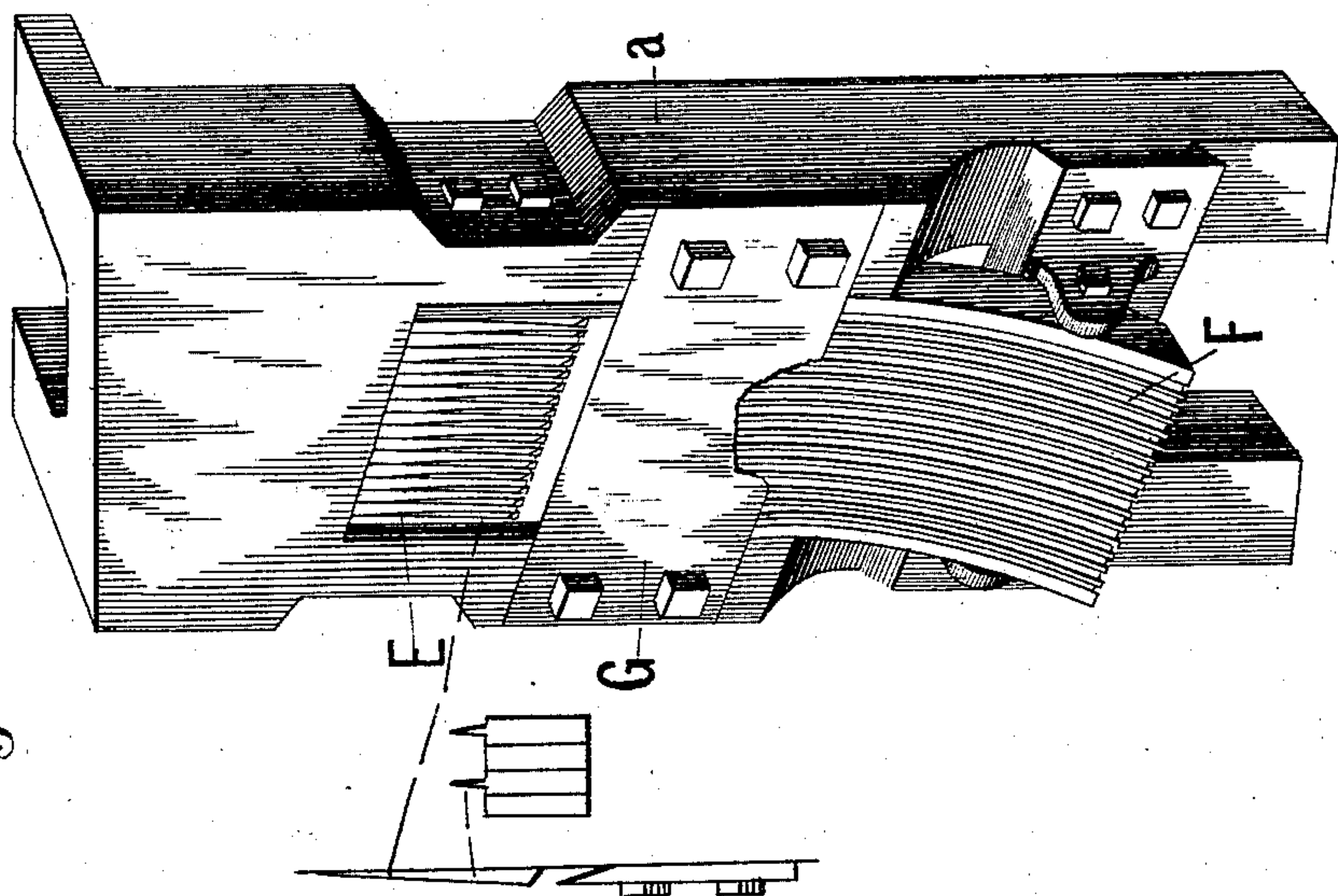


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE H. MILLEN, OF HULL, QUEBEC, CANADA, ASSIGNOR TO THE DIAMOND MATCH COMPANY, OF WILMINGTON, DELAWARE.

MATCH-SPLINT MACHINE.

SPECIFICATION forming part of Letters Patent No. 281,778, dated July 24, 1883.

Application filed January 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HENRY MILLEN, of the city of Hull, county of Ottawa, Province of Quebec, and Dominion of Canada, have invented new and useful Improvements in Machines for Making Match-Splints; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention is designed for making match-splints from solid blocks of the proper dimensions, and placing them, when made, in a proper frame ready for the dipping operation; and it consists, mainly, in combinations of certain mechanisms by the successive action of which the block is first scored and cut into splints, and these splints then are placed in a dipping-frame, as will be fully described hereinafter.

In the drawings, Figure 1 represents an enlarged perspective view of the entire machine; Fig. 2, a front elevation of the same; Fig. 3, a partial perspective view of one of the spurs of plate E detached; Fig. 4, a cross-section showing the cutting mechanism; Fig. 5, a perspective view of the grooved plate F and the dipping-frame; Fig. 6, a perspective view of the auxiliary frame *a*, having the blocks E and F and knife G attached thereto; and Fig. 7, a perspective view of the roller mechanism for feeding the splint-block, enlarged.

To enable others skilled in the art to make and use my invention, I will now proceed to describe fully its construction and manner of operation.

A represents a frame-work of any suitable construction, which serves as the main support of the remaining parts.

B represents the main shaft, receiving movement from any proper source of power, which is provided with the fast and loose pulleys *b* and *b'*, the fast pulley of which is adapted, by means of a proper belt, to give movement through the fast pulley of the fast and loose pulleys *c* and *c'* to the upper shaft, C, when desired. This shaft C is supported in proper bearings in the frame-work, and is provided at one end with the crank *c'*, as shown.

D represents a head-block, united by means of the pitman *d* to the crank *c'*, which head-

block is provided with recessed extensions *d'* and *d''*, adapted to support and guide the splint-block as it is fed to the machine, as will be hereinafter described.

d' represents a shaft, journaled in the head-block, which is provided at its center with the fluted feed-roller *d'*, Fig. 2, at one end with a ratchet-wheel, *d'*, and at the other with a gear-wheel, *d'*, as shown. *d''* also represents a shaft journaled in the head-block below the shaft *d'*, which is provided at its center with the fluted feed-roller *d''*, Fig. 2, and at one end with the gear-wheel *d''*, engaging with the gear-wheel *d'*, as shown in Fig. 7. Sufficient space is left between the rollers *d'* and *d''* to receive the splint-block K, Fig. 2, as will be hereinafter fully described.

d' represents a pawl pivoted upon the framework, the purpose of which will be hereinafter explained.

E represents a plate consisting of a series of independent blocks, each having on its face a wedge-shaped spur of tapering form, as shown in Fig. 3, which blocks, in connection with proper division-blocks, as shown in detached view, Fig. 6, are secured by bolts in the frame in such manner as to form a solid portion of the same, as shown.

F represents a grooved block securely bolted to the lower bracket of the frame, which is provided with diverging and curved ribs, the upper ends of which coincide with the lower ends of the spurs upon the plate E, as shown. This grooved block is covered in, as shown in Fig. 5, so that proper channels are formed for properly guiding the splints as they are formed by the machine.

G represents a knife or cutting-blade, which is bolted to the frame in a diagonal direction for the purpose of obtaining a drawing cut. The upper and cutting edge of this knife is located below the spurs, in the proper position to slice off from the block those portions which have been cut by them, as shown in Fig. 4.

H, Figs. 1 and 5, represents a supporting-bed having proper ways, and also a stop-plate, *h*, to limit the downward movement of the splints, as will be hereinafter described.

I represents a dipping-frame, consisting of three parallel perforated plates, the two outer

ones of which are rigidly united together, and the inner one of which is movable relatively to the other two. The dipping-frame is adapted to fit the ways and slide therein when properly actuated in a longitudinal direction. Each lateral row of perforations in the dipping-frame corresponds in number and relative position with the openings at the lower end of the grooved block F, and hence at the proper time the splints in the grooves may be discharged into the perforations.

J represents a shaft supported in proper bearings upon the supporting-bed, which is provided with the wheel j , having spurs j' , and at one end with the ratchet-wheel j'' , as shown. The spurs j' of wheel j , it will be observed, are adapted to engage with some of the longitudinal rows of perforations in the dipping-frame, so that the latter may be advanced at the proper time by its rotation.

j^3 represents a hook-pawl pivoted to the frame-work, as shown in Fig. 1, the upper arm of which is actuated at the proper time by a lug on the head-block for the purpose of revolving the ratchet-wheel j'' .

K, Fig. 2, represents a block of wood of suitable kind, which is of proper width to suit the machine, and of that height which exactly equals the length of a match. The block itself is so cut that when it is placed in the machine the grain of the same will lie in a vertical direction.

The operation is substantially as follows: The machine having been set in motion, the head-block D, by means of the pitman d and crank c^2 , will receive a continuous reciprocating movement, the feed-rollers d^3 d^7 , by means of the ratchet-wheel d^4 and pawl d^9 , an intermittent rotary movement, and the spur-wheel j , by means of the ratchet-wheel j^2 and the hook-pawl j^3 , an intermittent rotary movement. A block of wood of the proper dimension having been laid upon the extensions d' of the head-block and thrust in between the rollers, the following consecutive actions will result: By the descent of the head-block D, the block of wood K held thereby will be carried down first over the spurs of the plate E, and receive therefrom a series of vertical cuts, equaling in depth about the width of a match-splint, and then upon and past the knife G, by means of which the cut portions are sliced off to form a row of square match-splints. The splints thus cut off fall through the channel of the grooved plate F into the perforations of the dipping-frame I, or upon the space between the perforations, and then into the next row of holes when the frame is advanced. By the ascent of the head-block D the ratchet-wheel d^4 is caused to come in contact with the pawl d^9 upon the frame, and is rotated thereby one tooth. By means of this action the rollers d^3 d^7 are actuated to feed forward the block K into the proper position to be cut by the next descent of the head-block. By the ascent of the head-block, also, the hook-pawl j^3 is caused

to rotate the ratchet-wheel j^2 one tooth, and also the spur-wheel j upon the same shaft. By means of this action the dipping-frame engaged with the spur-wheel is advanced, so as to bring a new row of perforations beneath the openings of the channels of the block F. The dipping-frame, when filled, may be locked to prevent the splints from dropping out, when the frames are removed from the machine, by moving the middle plate of the frame so as to clamp the splints. If desired, however, any other proper means may be employed to receive and hold the splints. When filled and locked, the frame may be removed from the machine to the dipping troughs or table for the application of the match compound. The movement of the splints as they pass into the perforations of the dipping-frame being limited by the stop-plate h , their base portions will all lie necessarily in the same horizontal plane. From this it results that in the dipping operation each splint is exposed to the same depth of compound and receives a uniform amount. As fast as the frames are filled and discharged at one end of the machine, new frames are inserted at the other end. The head-block D also is supplied regularly with splint-blocks. By means of these services the machine is made continuous in its operation.

Some of the advantages of the described construction are as follows: All the mechanisms are automatic in their action, it being only necessary to supply the machine with the proper material and the proper frames and to remove the frames when filled. By locating the mechanism for forming the splints in a vertical plane, the operation of the same is facilitated by the action of gravitation. By constructing the machine with fixed cutting mechanism and movable mechanism for carrying the block over and past the cutters, increased stability and durability are obtained. The mechanism, in view of the work to be accomplished, is simple in construction.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a match-machine, the combination of the splint-cutting mechanism with the vertical block F, having inclined grooves adapted to deliver the splints to the dipping-frame, and the horizontally-moving dipping-frame, as described.

2. The machine described, having an intermittently-moving feed mechanism, a reciprocating head-block carrying the splint-block and moving in a vertical plane, a series of fixed spurs for cutting the edge of the block, a fixed knife for slicing off the cut portion, a guiding-block located in a vertical plane, and a horizontally-moving dipping-frame, substantially as described.

3. In combination with mechanism, substantially as described, for advancing the splint-block, mechanism, substantially as described, for giving the head-block a reciprocating

movement, the fixed plate E, having the spurs, the knife G, located past the spurs, and the grooved plate F.

4. In combination with mechanism, substantially as described, for moving the splint-block, the fixed spur-plate E, consisting of a series of independent elongated wedge-shaped spurs of tapering form, as shown and described.

5. In combination with a horizontally-moving dipping-frame having a series of openings for receiving the match-splints, a wheel having spurs as described, adapted to engage with the openings in the frame.

6. In combination with the dipping-frame I, having openings for receiving the match-splints, the wheel j , having spurs, as described, adapted to engage with the openings, the ratchet-wheel j^2 , and the hook-pawl j^3 upon the frame.

This specification signed and witnessed this 20 29th day of December, 1882.

GEO. H. MILLEN.

Witnesses:

C. D. CHITTY,
CHS. DESSAINT.