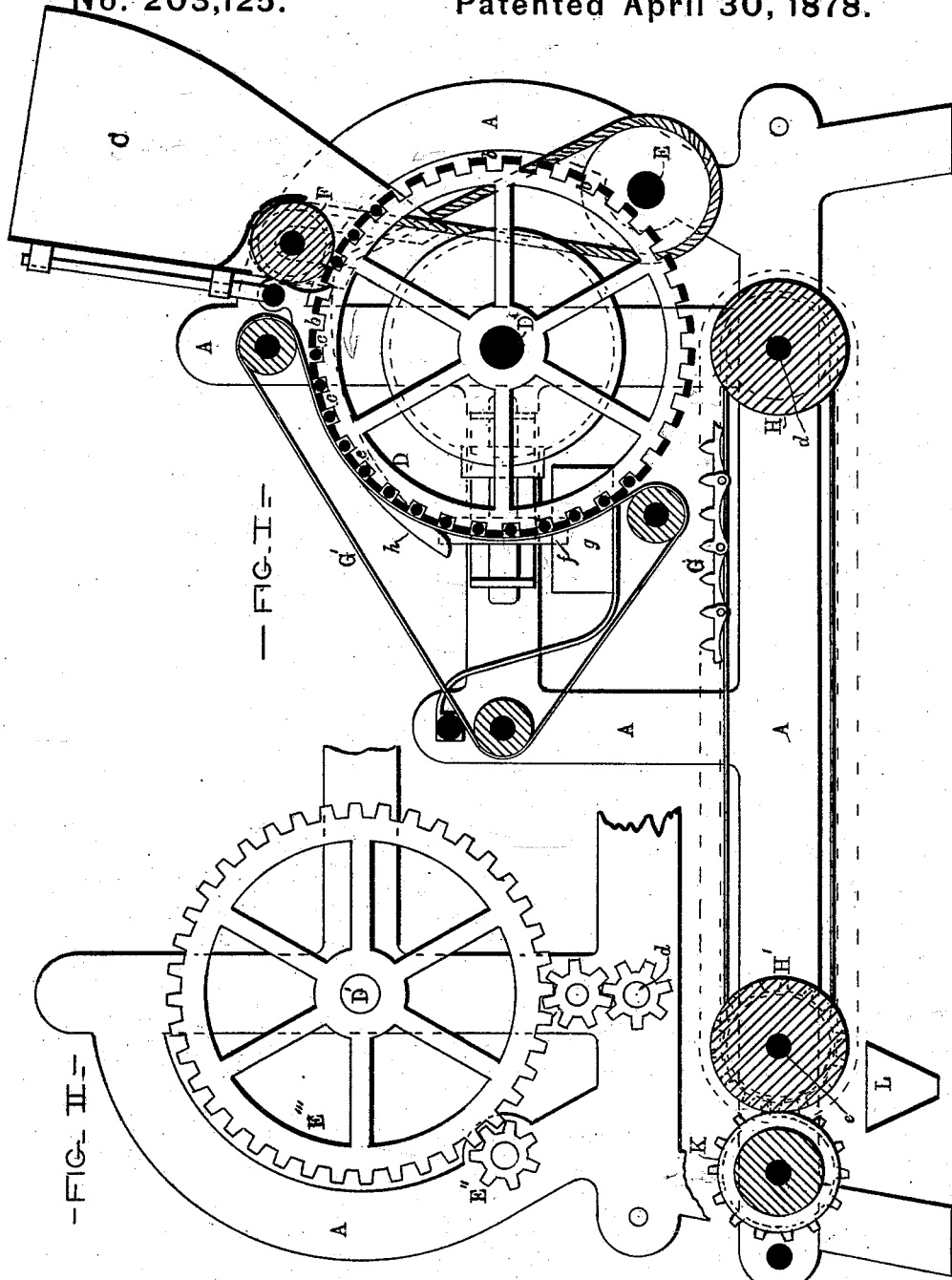


C. J. DONNELLY.
Match-Machine.

No. 203,125.

Patented April 30, 1878.



— FIG. I —

— FIG. II —

— WITNESSES —

H. B. Coffey
Alex Scott

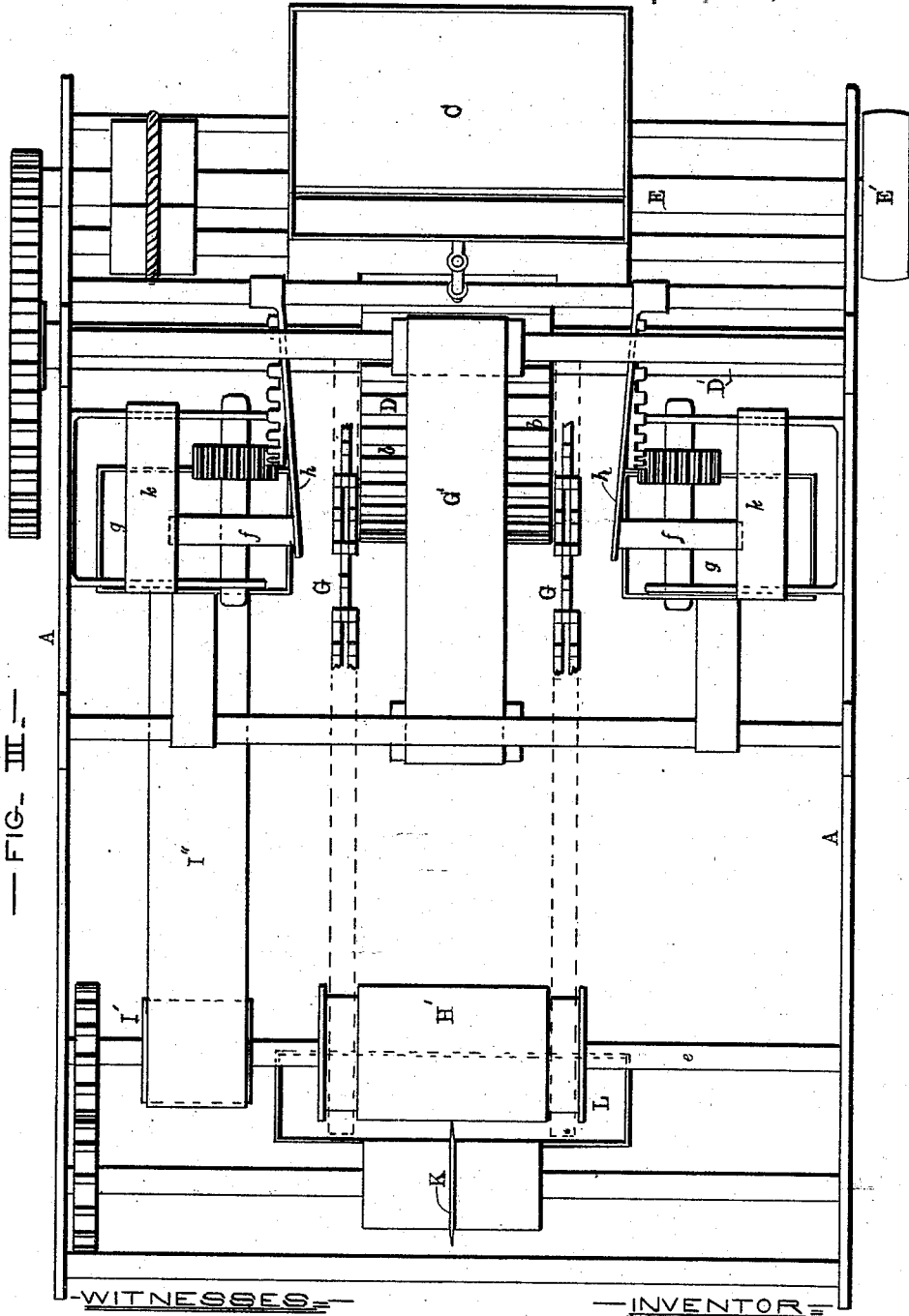
— INVENTOR —

Charles J. Donnelly
by A. H. W. [unclear]

C. J. DONNELLY.
Match-Machine

No. 203,125.

Patented April 30, 1878.



— FIG. III. —

WITNESSES

INVENTOR

F. B. Croff
Alex. Scott

Charles J. Donnelly
by W. W. J. Howard
attor.

UNITED STATES PATENT OFFICE.

CHARLES J. DONNELLY, OF YORK, PA., ASSIGNOR OF ONE-HALF HIS RIGHT TO PETER B. SPRENKLE AND ABRAHAM B. SPRENKLE, OF SAME PLACE.

IMPROVEMENT IN MATCH-MACHINES.

Specification forming part of Letters Patent No. 203,125, dated April 30, 1878; application filed March 9, 1878.

To all whom it may concern:

Be it known that I, CHARLES J. DONNELLY, of York, in the county of York and State of Pennsylvania, have invented certain Improvements in Match-Machines, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

This invention relates to certain improvements in a machine whereby match-splints placed in a hopper, after the treatment of their ends with sulphur, are removed singly therefrom through the medium of a revoluble longitudinally-grooved drum, adapted to conduct them between two supplemental drums revolving partially within trays containing the phosphorus igniting preparation, the said splints being afterward carried upon a pair of endless chains to a device which severs them into completed matches, which fall to a receiving-hopper, and thence to the match-boxes.

In the drawing forming a part hereof, Figure 1 is a sectional side view of the machine. Fig. 2 is a side elevation of a part of the machine as seen from a different point of view. Fig. 3 is a plan of the machine.

Similar letters of reference indicate similar parts in all the figures.

A is the frame of the machine, and C is the hopper into which the splints, after the treatment of their ends with sulphur, are placed.

A drum, D, keyed to a shaft, D', resting in suitable bearings, is provided with grooves *b*, slightly exceeding in width the thickness of the splints, which are represented by *c*. The said drum revolves in close proximity to the lower end of the hopper C, and is driven by the following-described mechanism. A driving-shaft, E, is at one end furnished with a driving-pulley, E', and at the other with a pinion, E'', which gears into a spur-wheel, E''', on the drum-shaft D'. A roll, F, located in the hopper C, and revolved from the driving-shaft E by means of pulleys and a belt connecting them, serves to press the splints closely within the grooves *b* in the drum D, and also to prevent the splints from becoming packed within the said hopper. The splints, after passing from the hopper C to the grooves in

the drum D, are carried to the lower side of the said drum and dropped upon a pair of endless chains, G, having projections on their outer surfaces to separate the splints when resting thereon. During the progress of the splints to the under side of the drum D the said splints are held securely in the grooves *b* in the drum by means of a tape or belt, G', which may be either stationary or have a movement corresponding to the surface of the drum D in contact therewith. The endless chains G, which extend over chain-heads H H', are actuated through the medium of a system of gear-wheels connecting the shaft *d* of the chain-head H with the spur-wheel E''', and the motion of the shaft *d* is communicated to the shaft *e* of the chain-head H', independently of the endless chains, by means of the pulleys I I' and the belt I''.

The phosphorus composition is applied to the ends of the splints while they are located in the grooves *b*, and while passing from the hopper to the under side of the drum and to the endless chains, and the devices whereby the said composition is applied are as follows: Two dipping-drums, *f*, located partially within trays *g*, containing the composition, are driven from the main drum-shaft D' by means of suitable gearing, and the distance between the said drums *f* is slightly greater than the length of the splints. The splints are guided so as to not strike either of the drums *f*, by means of arms *h*, projecting from any stationary part of the frame A, near to the base of the hopper C.

The object in having the drums *f* to revolve is primarily to charge the edge of the said drums with the compound from the trays; but the revolution of the drum also causes each splint to come in contact with a body of the phosphorus preparation not before touched, thereby effecting uniformity in the size of the match-heads or the quantity of the preparation deposited on the ends of each splint.

The proper thickness of the coating of phosphorus composition on the drums *f* to effect the desired size of head is regulated by the position of adjustable gages *k*, which may be moved to and from the drums *f* at pleasure.

The length of the endless chains G is designed to be such as to give sufficient time for the heads of the splints to dry before reaching

the chain-head H' ; and in order to obtain great length in the chains G in a limited space, they may be made to travel upward and downward over or about a series of rollers, as well as horizontally, as shown.

A circular knife, K , revolved by means of suitable gearing from the shaft e , having its periphery in contact with a roll located between and secured to the two parts of the chain-head H' , severs the splints centrally of their length before they are dropped to the receiving hopper or funnel L , which leads direct to the match-box, into which the completed matches, now thoroughly dry, are allowed to fall.

Thus it is seen that this machine is a complete dipping and box-filling machine.

I am aware of the patent granted April 29, 1851, to Ira H. Smith, and numbered 8,066, and disclaim the invention therein described.

Having thus described my invention, what I claim as new, and wish to secure by Letters Patent of the United States, is—

1. The combination of the hopper C , longitudinally-grooved drum D , roll F , tape or belt G' , drums f , and trays g , substantially as specified.

2. The combination of the drum D , tape or belt G' , trays g , drums f , and sliding gages k , substantially as described.

3. The combination of the longitudinally-grooved drum D , tape or belt G' , and endless chains G , having projections thereon, substantially as and for the purposes specified.

4. The combination of the cutting-disk or circular knife K with the chain-heads and endless chains G , having projections thereon, whereby the splints are severed after they have fallen from the drum D and been deposited on the said chains, substantially as set forth.

5. In combination with the longitudinally-grooved drum D and the drums f , the arms h , having such relation to the said parts as to guide the splints centrally between the drums f , substantially as and for the purpose herein described.

6. The combination of the drum D , tape or belt G' , endless chains G , having projections, as described, circular knife K , and hopper or funnel L , leading direct to the match-boxes, substantially as set forth.

7. The shaft D' , carrying the drum D , and gear-wheels at each side of the same, combined with the dipping-drums f , on their respective shafts bearing gears which mesh with the wheels on the shaft D' , substantially as set forth.

In testimony whereof I have hereunto subscribed my name this 28th day of January, in the year of our Lord 1878.

CHARLES J. DONNELLY.

Witnesses:

GEORGE M. SHETTER,
A. W. SHETTER.