

(No Model.)

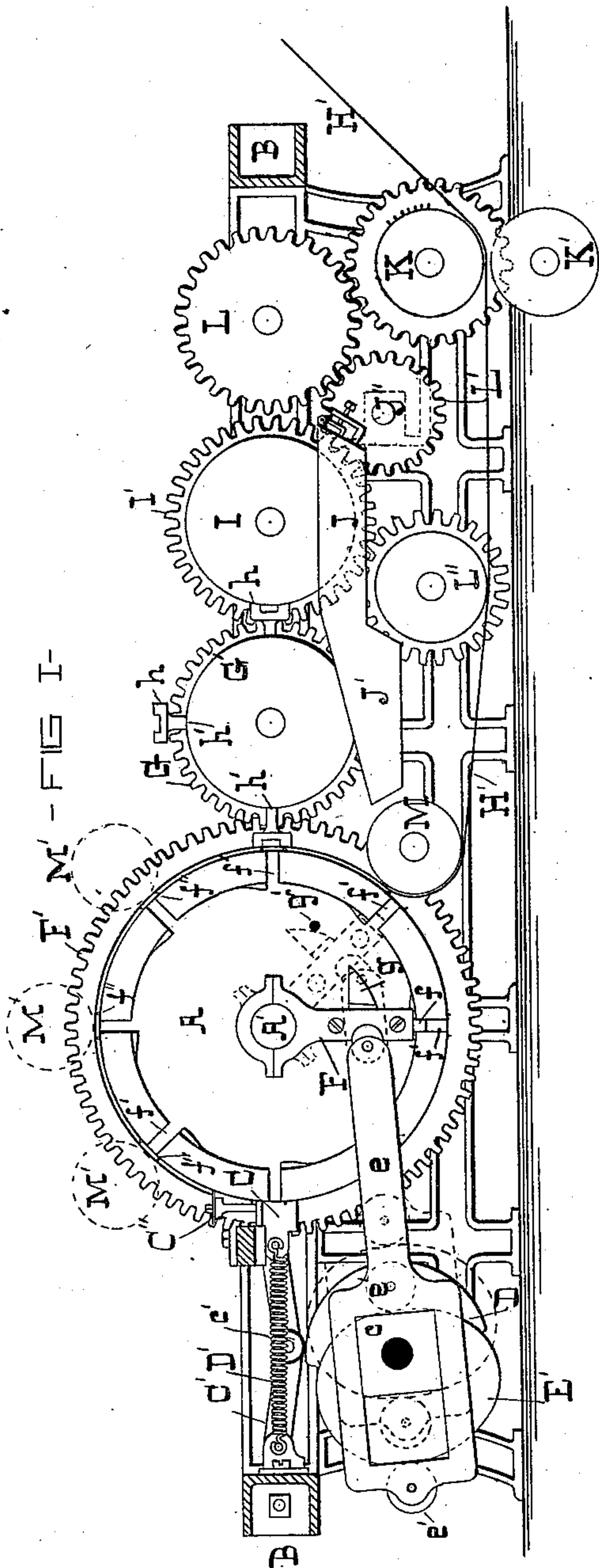
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C. J. DONNELLY.

MACHINE FOR MAKING MATCH BOXES.

No. 351,627.

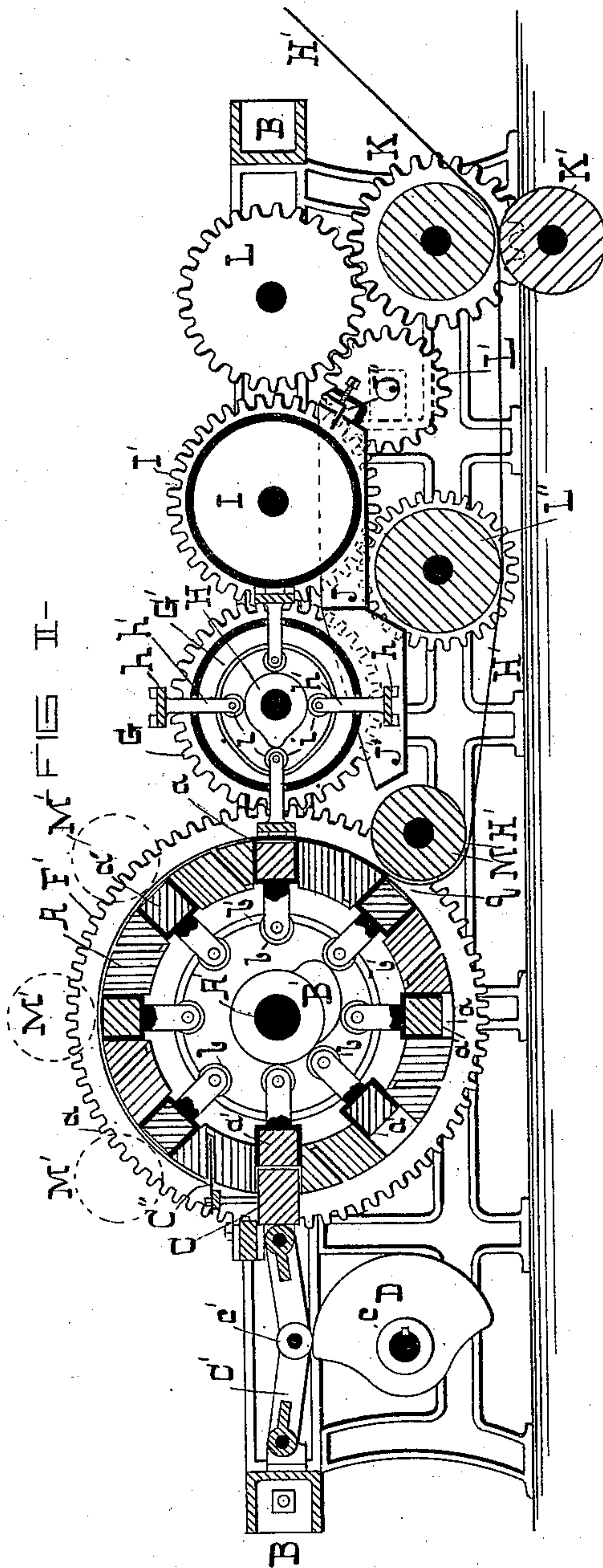
Patented Oct. 26, 1886.



- WITNESSES -

Paul Fisher

Chas. Blossady



- INVENTOR -

Charles J. Donnelly,

by G. H. Howard,

Attys -

(No Model.)

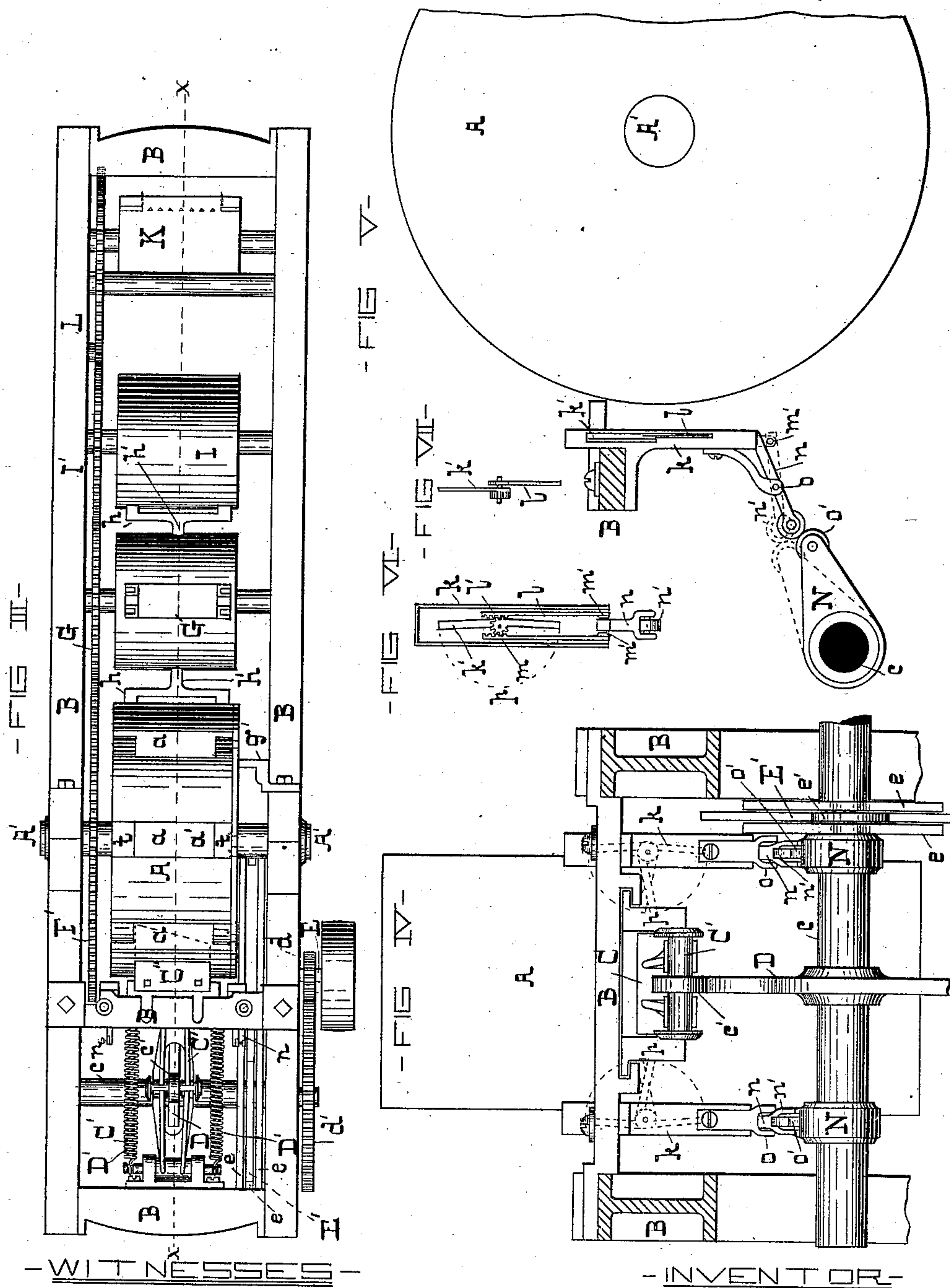
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C. J. DONNELLY.

MACHINE FOR MAKING MATCH BOXES.

No. 351,627.

Patented Oct. 26, 1886.



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(No Model.)

3 Sheets—Sheet 3.

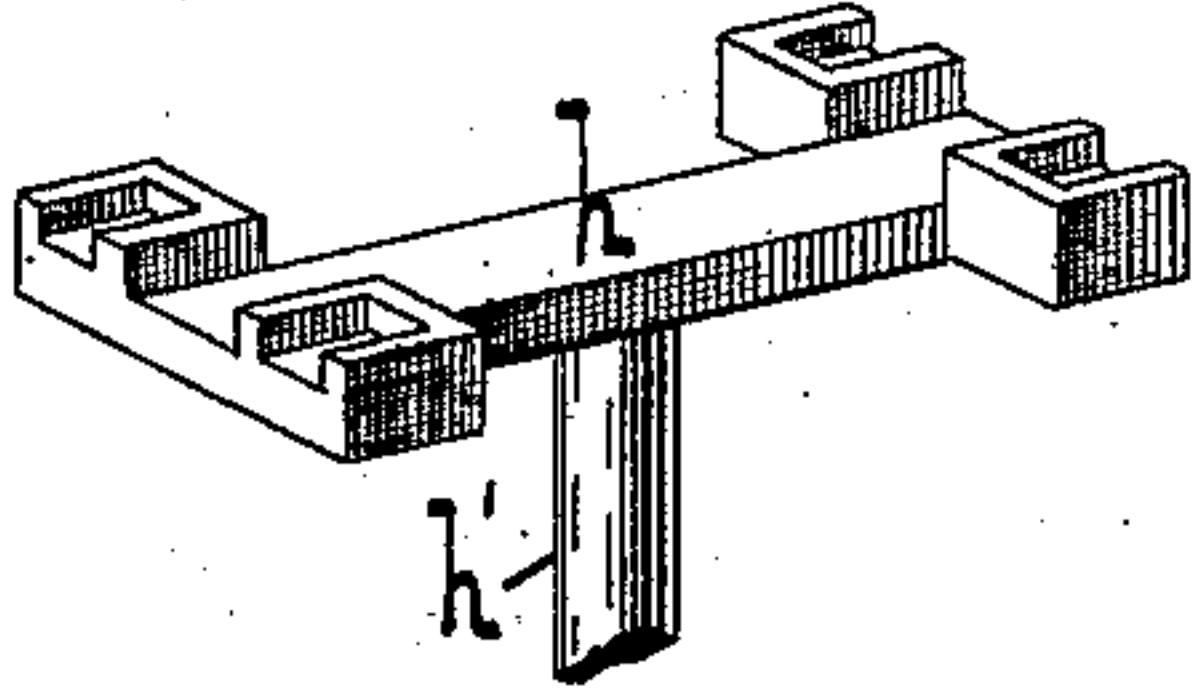
C. J. DONNELLY.

MACHINE FOR MAKING MATCH BOXES.

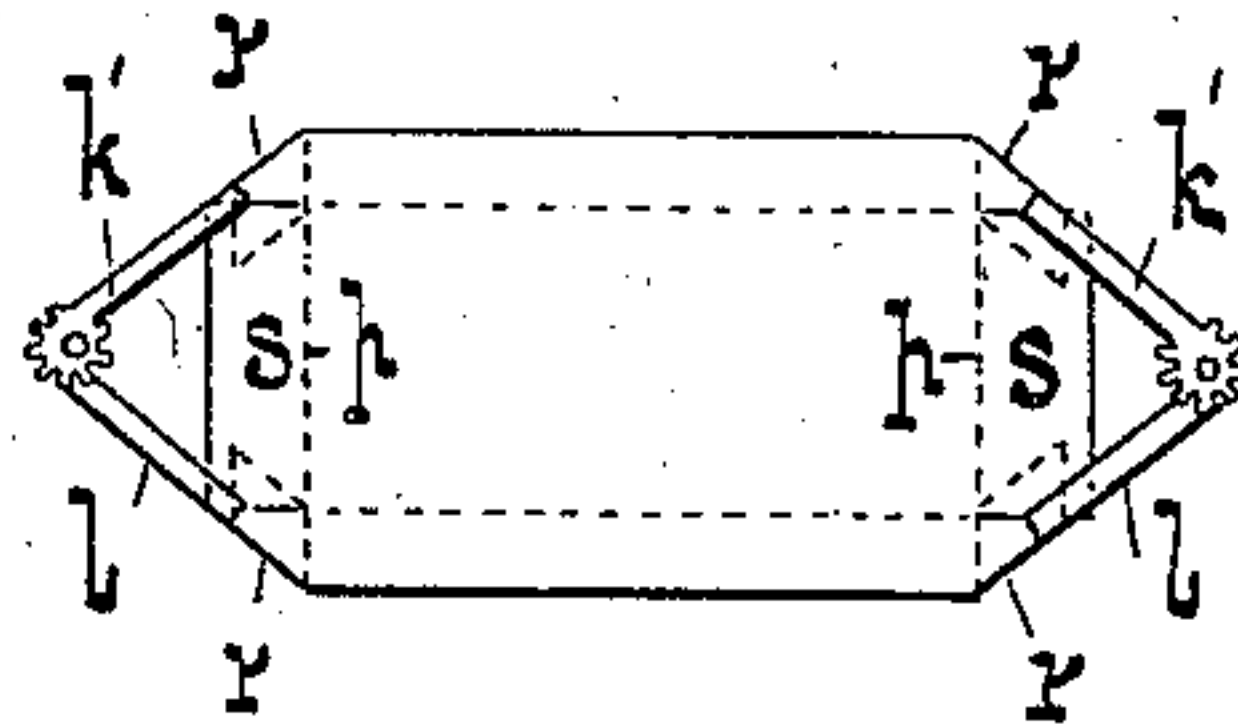
No. 351,627.

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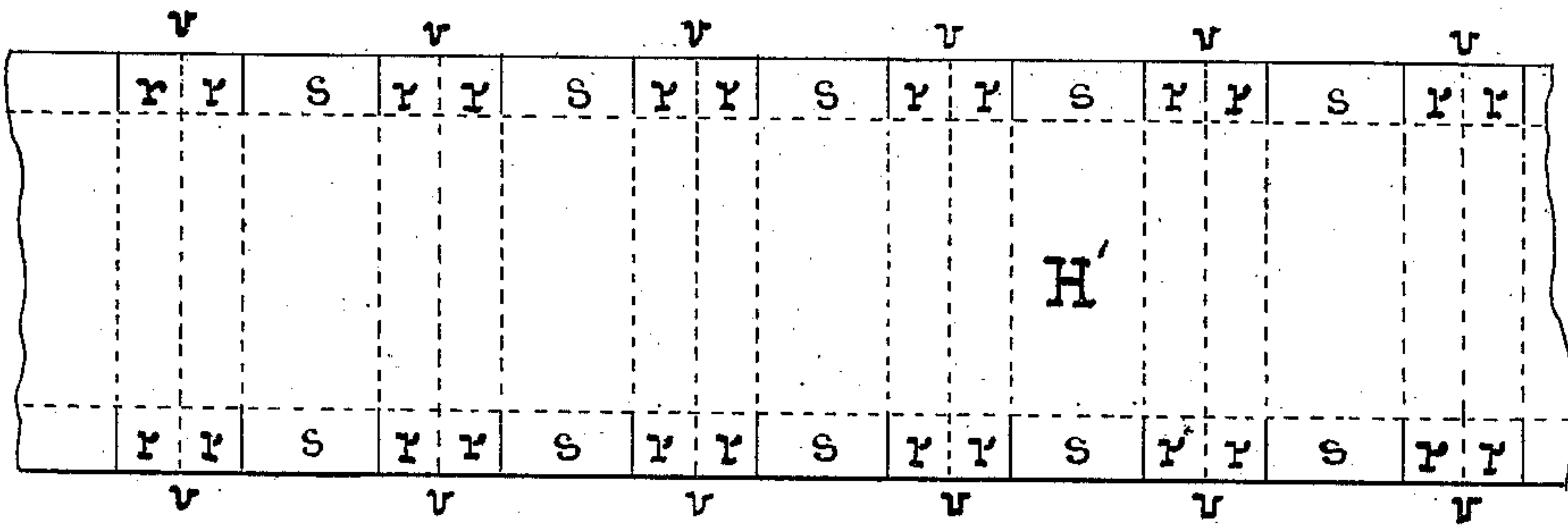
- FIG VII -



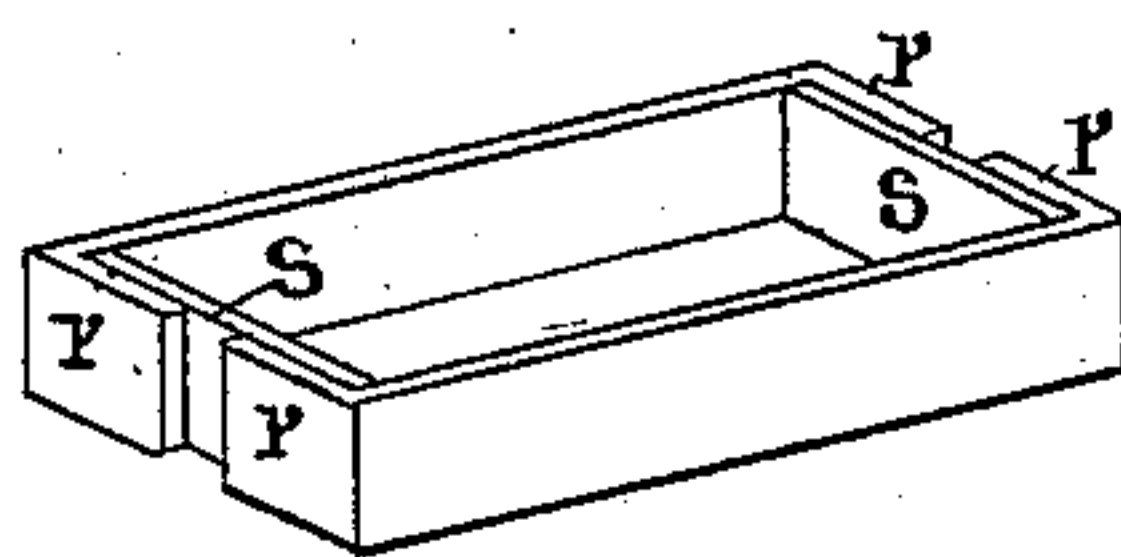
- FIG IX -



- FIG X -



- FIG XI -



- WITNESSES -

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UNITED STATES PATENT OFFICE.

CHARLES J. DONNELLY, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR MAKING MATCH-BOXES.

SPECIFICATION forming part of Letters Patent No. 351,627, dated October 26, 1886.

Application filed June 10, 1884. Renewed June 26, 1886. Serial No. 206,376. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. DONNELLY, of the city and county of Philadelphia and State of Pennsylvania, have invented certain
5 Improvements in Machines for Making Match-Boxes, of which the following is a specification.

This invention relates to certain improvements in a machine designed to make the sliding drawer of a paper match-box or a paper
10 box with a hinged lid; and it consists in the combination of devices hereinafter specified and claimed.

Figure I is an exterior view of the machine with one side of the frame and certain of the
15 gearing removed. Fig. II is a longitudinal section taken on the dotted line *x x*, Fig. III. Fig. III is a plan of the invention. Figs. IV to IX, inclusive, are details of the invention on an enlarged scale. Fig. X is a view of a
20 piece of the scored and notched paper used in making match-box drawers. Fig. XI is a view of a completed drawer.

A is a hollow cylinder adapted to revolve on a stationary shaft, A', which is held in a suitable frame, B. The cylinder A has eight rectangular openings, *a*, in which the boxes are
25 formed, and each opening has a block, *a'*, therein, which is provided with a roller, *b*, at its inner end, as shown in Fig. II.

B' is a cam fastened to the stationary shaft A', and it is of such size and shape that in the revolution of the cylinder A each block *a'* is forced out at a certain point, which point is the place of discharge for the boxes, as here-
30 inafter described. A ring, *b'*, serves to prevent the blocks *a'* from extending beyond the surface of the cylinder A.

C is a plunger connected by a toggle, C', to a portion of the frame B, and D is a cam on the shaft *c*, which in its revolution straightens the toggle C' and drives the plunger C into one of the openings *a*. After the full portion of the cam D has passed, the toggle, which is provided with a roller, *c'*, is bent by the action of
40 the springs D' and the plunger withdrawn from the opening. The shaft *c* receives its movement from a driving-shaft, E, through the medium of the gears *d* and *d'*, which are shown only in Fig. III of the drawings.

50 Referring particularly to Fig. I, a second cam, E', on the shaft *c*, is used in connection with a slotted double rod, *e*, having rollers *e'*,

to vibrate an arm, F, dependent from the shaft A'. At the lower end of the arm F is a spring-bolt, *f*, adapted to enter any one of eight notches, 55 *f'*, in the exterior rim of the cylinder A. The cam E', together with its rod *e*, arm F, and the spring-bolt *f*, has the effect of producing an intermittent motion of the cylinder A, and brings the openings *a* successively opposite the plunger C. As the arm F completes its forward stroke, the spring-bolt *f* is lifted from its notch *f'* by means of a spur, *g*, which is attached to the said bolt, and comes in contact with a pin, *g'*, projecting from the frame B. The momen- 65 tum of the cylinder causes it to slightly pass the point at which the spring-bolt *f* could re-enter the notch *f*. A retrograde movement of the cylinder A is prevented by means of any suitable mechanism arranged for the purpose; 70 but such mechanism is not shown herein, as it would tend to complicate the drawings.

The periphery of the cylinder A, at one end thereof, has a spur-wheel, F', which is in gear with a second wheel, G, on the end of the 75 gluing-drum G'. This gluing-drum is one-half as large as the cylinder A, and consequently has only four gluing-blocks, *h*, and is revolved at double the speed of the said cylinder. The gluing-blocks, one of which is 80 shown in perspective and on an enlarged scale in Fig. VIII, have stems *h'* and rollers *i* at their ends. These rollers *i* come in contact with a stationary grooved cam, H, by means of which the gluing-blocks are forced in con- 85 tact with the paper H' as it passes around with the cylinder A. The gluing-blocks *h* receive their supply of glue from a glue-supply drum, I, which is driven from the drum G' through the medium of the spur-wheel G and the similar spur, I', and revolves in a gluing-tray, J. The tray J has an extension, J', to receive any glue which may drop from the gluing-blocks *h*.

K K' are wheels such as are commonly used in machines of this class to notch and score 95 the paper strip and adapt it to be bent and folded into a match-box drawer. (Shown in Figs. X and XI.) These scoring-wheels also serve to unwind the paper strip from the roll, (which is not shown,) and they are driven from 100 the spur-wheel I' through the medium of idlers L and L'. The paper passes under a feeding-roll, L'', and thence under an idler, M, to the surface of the cylinder A, and around the cyl-

inder to where it is formed into a drawer. When necessary, the paper may be supported by tables, (not shown,) and it is held in close contact with the surface of the cylinder A, and prevented from slipping by means of compressing-rollers M' (shown in dotted lines, Figs. I and II) and the points *f''* on the cylinder.

Parts of the invention not yet alluded to will be described and their uses fully set forth in the description of the operation of the machine which follows. Supposing the machine to be in operation, and the paper strip from which the box-drawers are made to be on a reel with its end on the cylinder A, as shown in Figs. I and II, a portion of the scored and notched paper is at each stroke severed from the roll, on the dotted line *rr*, Fig. X, by the action of the knife C', secured to the upper side of the plunger C, and which projects beyond it. The severed end of the paper is then forced into one of the openings *a* and compressed between the plunger and one of the blocks *a'*. The sides of the drawers are turned out by the action of the plunger alone, but the ends are required to be lapped by means not connected directly with the plunger. To effect this result I employ at each side of the plunger C a stand, *k*, which is secured to some part of the frame B. In this stand are pivoted two fingers, *k'* and *l*, with toothed hubs, and two racks, *l'* and *m*, with which the said hubs are in gear. Both racks are connected by a pin, *m'*, to a lever, *n*, having a roller, *n'*, at its outer end. The fulcrum of the said lever is at *o*. An arm, N, (shown on an enlarged scale in Figs. IV and V,) on the shaft *c*, having a roller, *o'*, at its end, comes in contact in its revolution with the roller *n'* at the end of the lever *n*, and raises it, as shown by its dotted delineation, Fig. V. The arm N is omitted from Figs. I, II, and III, for the reason that its representation would tend to complicate those views, and its office will be fully understood by reference to Figs. IV and V. The fingers are thus made to describe a circular line, (shown dotted in Figs. IV and VI,) and in this movement they strike the square corners *r*, (shown in Figs. IX, X, and XI,) and turn or fold them over the parts *s*. (See Fig. IX.) The folding of the said parts so as to admit of the blank being forced in the opening *a* is completed as the fingers cross each other at the points *p*. (See Figs. VI and IX.) It will be understood that in forming the openings *a* the cylinder is practically flattened where these openings occur, and as the openings do not extend entirely across the cylinder, there are projecting corners *t* left, which serve to turn in the parts *s* before the sides of the blank reach the sides of the opening. In other words, as the blanks are forced into the openings *a* the parts *s* are turned up by the corners *t*, and this occurs before the sides are turned up and before the fingers *k'* and *l* engage with the corners *r*. Consequently, when the said corners are turned in they are invariably folded over the parts *s*, which operation brings the pasted

faces in contact with the outer faces of the parts *s*. It must be understood that before the paper reaches the plunger C it has been scored, notched, supplied with glue, and the end severed, so that when it is forced into the opening *a* it is completed. The boxes remain in the openings until they reach the point *q*, where they are discharged, owing to the blocks against which they rest being forced out by the cam B to the surface of the cylinder A.

In Fig. II the gluing-blocks are shown as having reciprocating motion obtained by means of a grooved cam, H; but, if preferred, an ordinary cam may be employed and the blocks retracted by means of springs, the cam only serving to force out the said blocks.

To regulate the thickness of the coating of glue on the gluing-drum I, I provide the tray J with an adjustable gage, J'', which may be set to the proper distance from the said drum, so as to sweep off the superfluous material.

I claim as my invention—

1. In a machine for making paper boxes, a hollow cylinder having an intermittent rotary movement, with rectangular openings in its surface, a central stationary shaft and cam situated centrally of the cylinder, blocks adapted to slide in the said openings and to be forced to the surface of the said cylinder by the action of the said cam, a reciprocating plunger to force notched, scored, and glued paper within the said openings and against the said blocks, and a knife having a movement in advance of the said plunger to sever from the paper strip the portion thereof which is to be forced into the openings in the said cylinder, all combined substantially as specified.

2. In a machine for making paper boxes, a hollow cylinder having an intermittent rotary movement, with rectangular openings in its surface, a stationary shaft and cam situated centrally of the cylinder, blocks adapted to slide in the said openings and to be forced to the surface of the said cylinder by the action of the said cam, a knife to sever a box-blank from a strip of paper or straw board fed to the said cylinder, a reciprocating plunger adapted to force the paper blank into one of the openings in the said cylinder and against a yielding block therein which ultimately discharges the box from the cylinder, notching and scoring devices to prepare the strip of paper fed to the cylinder, and gluing devices to apply glue to the said paper strip, substantially as specified.

3. In a machine for making paper boxes, a revolvable hollow cylinder having rectangular openings in its surface, a central stationary shaft, and cam situated centrally of the cylinder, blocks adapted to slide in the said openings and to be forced to the surface of the said cylinder by the action of the said cam, and a reciprocating plunger to force notched, scored, and glued paper within the said openings and against the said blocks, all combined substantially as specified.

4. In a machine for making paper boxes,

the combination of a revoluble cylinder having rectangular openings in its surface, a plunger adapted to enter successively the said openings, a toggle with retracting-springs connected with the said plunger, and a revoluble cam to straighten the said toggle, substantially as specified.

5. In a machine for making paper boxes, a hollow cylinder with box-openings in its surface, adapted to have an intermittent rotary movement, blocks in the said openings susceptible of a reciprocating motion, as described, a plunger to force the scored, notched, and glued paper into the said openings, combined with a revoluble gluing-drum carrying projecting gluing-blocks which are forced out and against the said scored and notched paper on the drum before the same reaches the plunger, substantially as specified.

6. In a machine for making paper boxes, a

revoluble cylinder having rectangular openings in its surface, with a plunger adapted to enter successively the said openings, and mechanism to actuate it, combined with the gluing-drum G', having the reciprocating gluing-blocks *h*, stationary shaft, and fixed cam H, to effect the said reciprocating movement of the said blocks, and the glue-supply drum, with the glue-tray J, substantially as specified.

7. As means for turning in the notched ends of the box-blanks, the fingers *k'* and *l*, having toothed hubs combined with toothed racks *l'* and *m*, lever *n*, and means to effect an intermittent movement of the said lever at the proper time, substantially as specified.

CHARLES J. DONNELLY.

Witnesses:

CHARLES W. SPARHAWK,
ROBERT W. DAVIS.