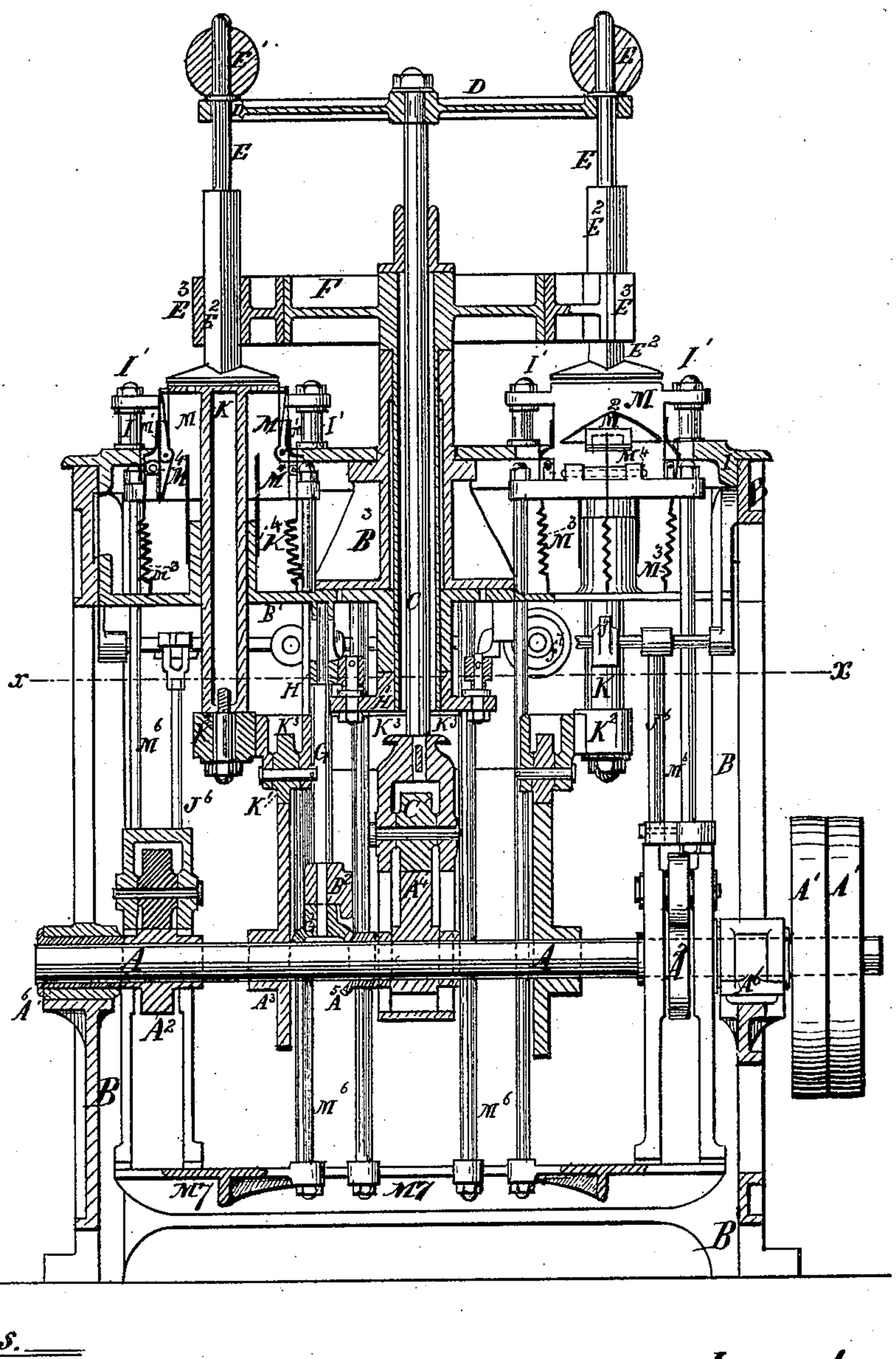
(No Model.) 6 Sheets—Sheet 1.

E. HELY.

ENVELOPE MACHINE.

No. 245,493. Patented Aug. 9, 1881.

Fig 1.



Witnesses.

Robt. L. Miller

D P Lowe

Inventor.

Edward Hely

By Philip T. Dodge atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

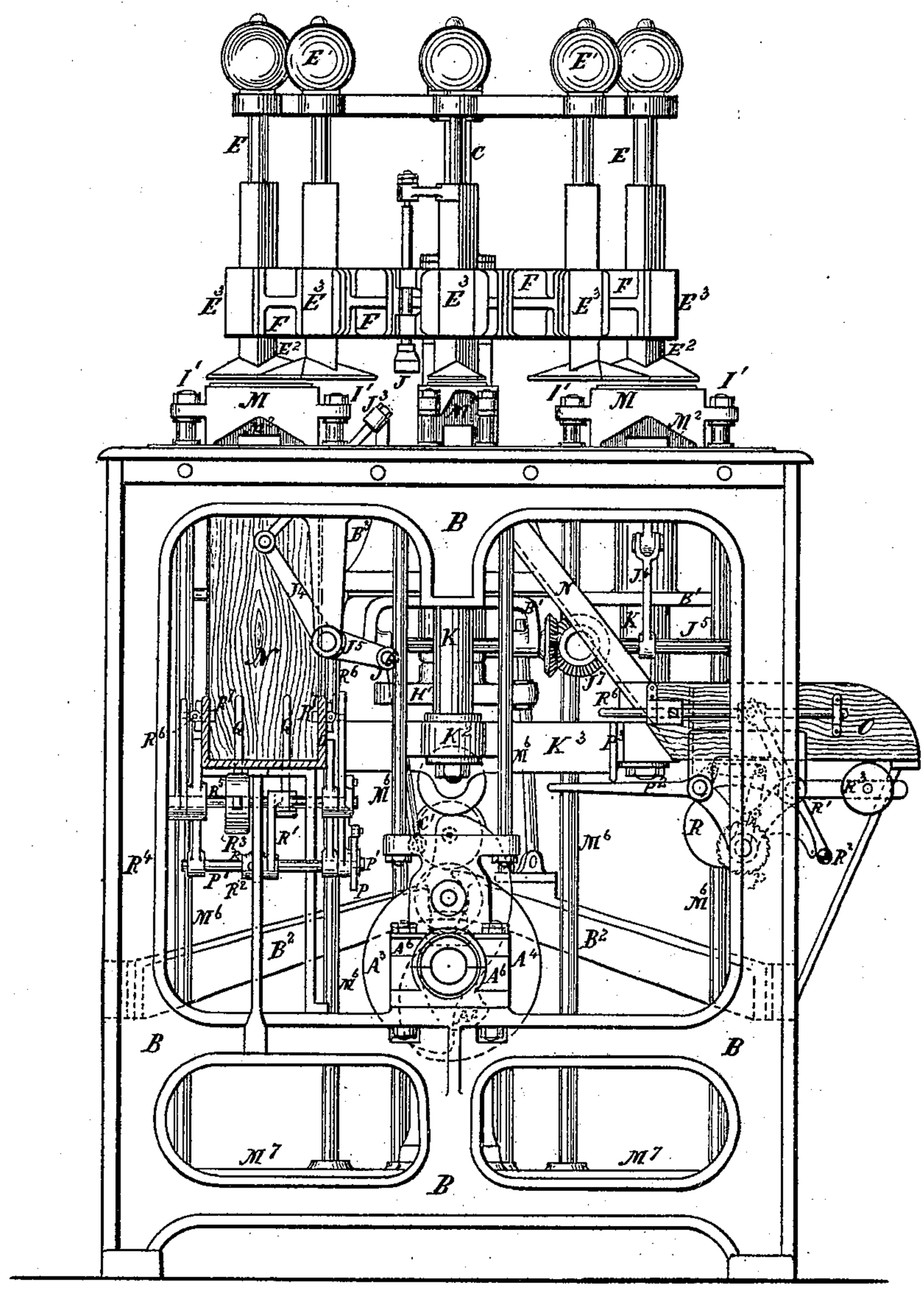
(No Model.) 6 Sheets—Sheet 2.

E. HELY.

ENVELOPE MACHINE.

No. 245,493. Patented Aug. 9, 1881.

Fig 2.



Witnesses.

Robt. L. Miller

D. P. Lowe

Inventor.

Edward Hely

By Philip F. Dodge.
Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 6 Sheets—Sheet 3.

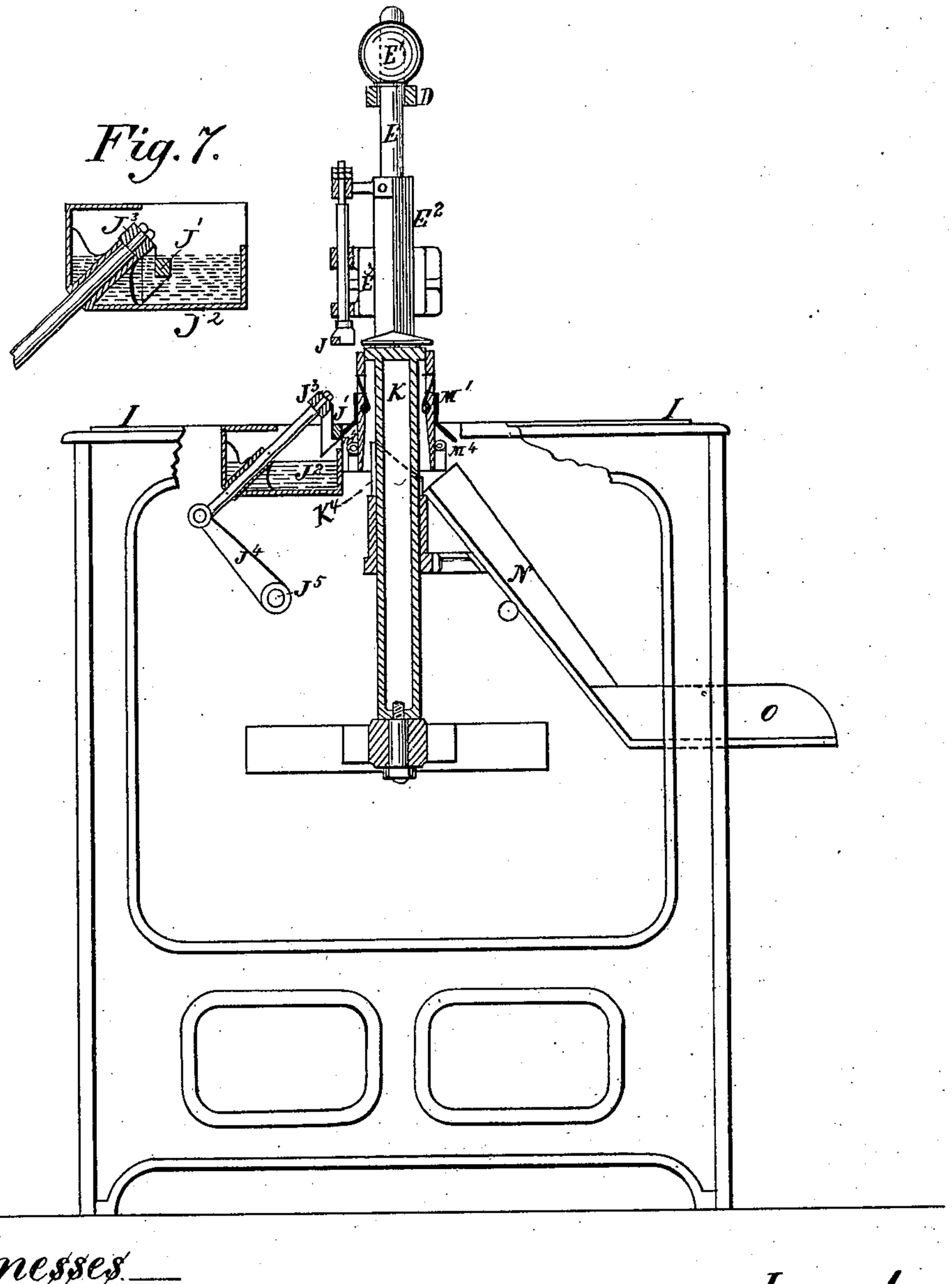
E. HELY.

ENVELOPE MACHINE.

No. 245,493. Patented Aug. 9, 1881.

Fig 3

Fig. 7.



Witnesses

Robt. L. Miller

D. P. Core

Inventor.

Edward Hely

By Philip F. Dodge atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

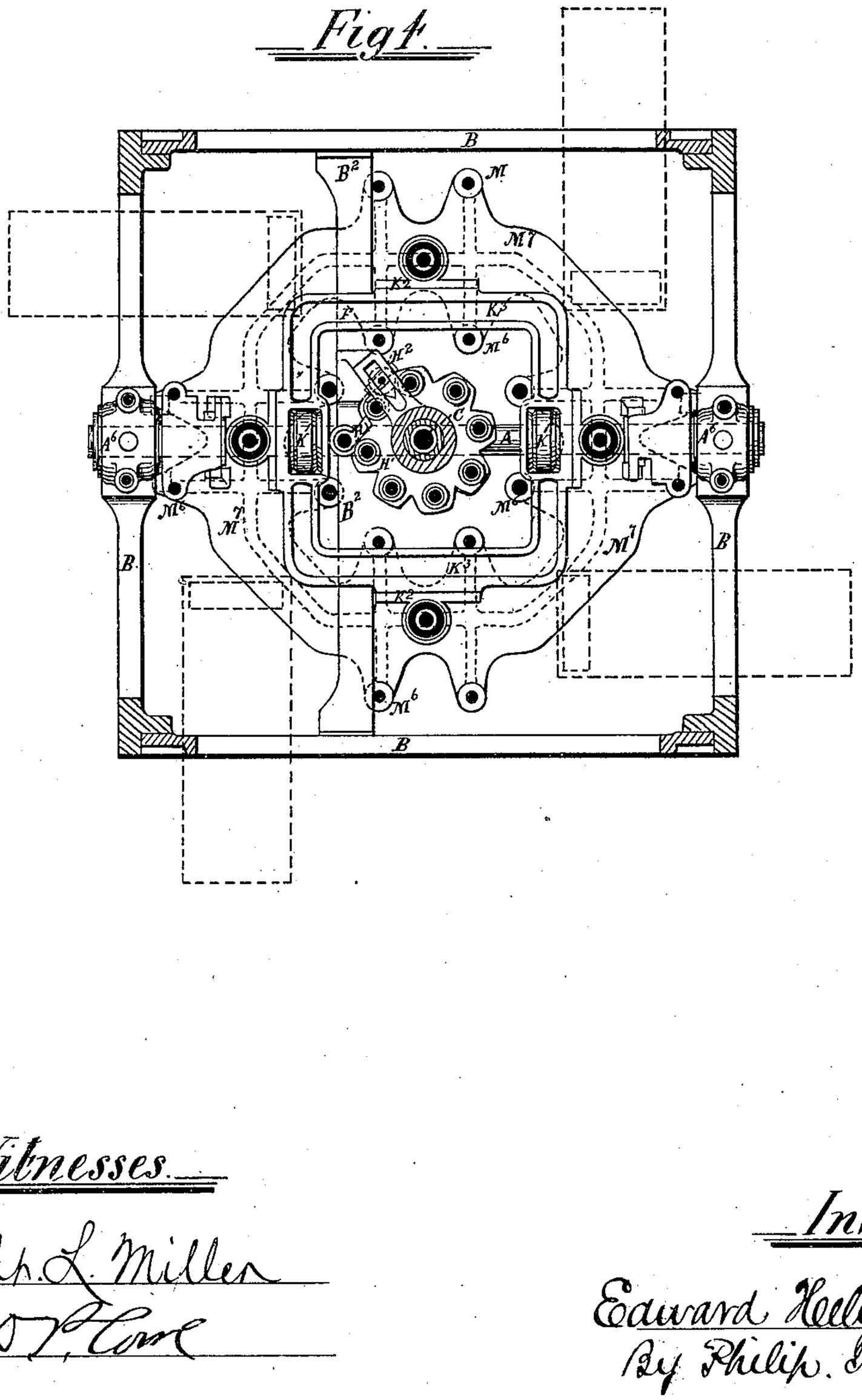
(No Model.) 6 Sheets—Sheet 4.

E. HELY.

ENVELOPE MACHINE.

No. 245,493. Patented Aug. 9, 1881.

Fig 1.



Witnesses.

Robt. L. Miller

D. P. Lore

Inventor.

Edward Hely

By Philip. T. Dodge Atty

N. PETERS. Photo-Lithographer. Washington, D. C.

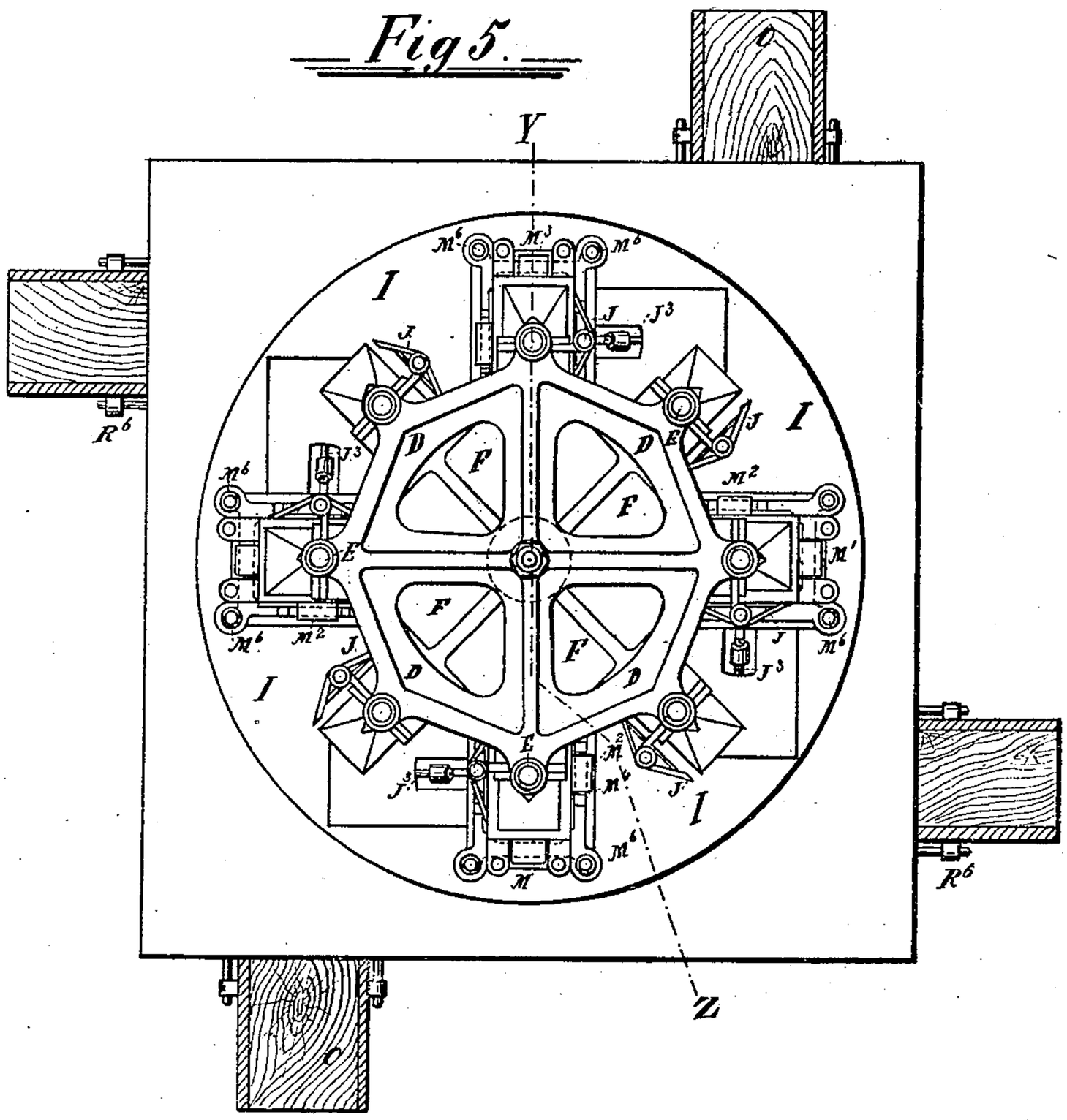
(No Model.) 6 Sheets—Sheet 5.

E. HELY.

ENVELOPE MACHINE.

No. 245,493. Patented Aug. 9, 1881.

Fig 5.



Witnesses.

Robt. L. Miller

A. P. Lord

Inventor.

Edward Hely.

By Philip T. Dodge.
Atty.

N. PETERS. Photo-Lithographer Washington, D. C.

(No Model.)

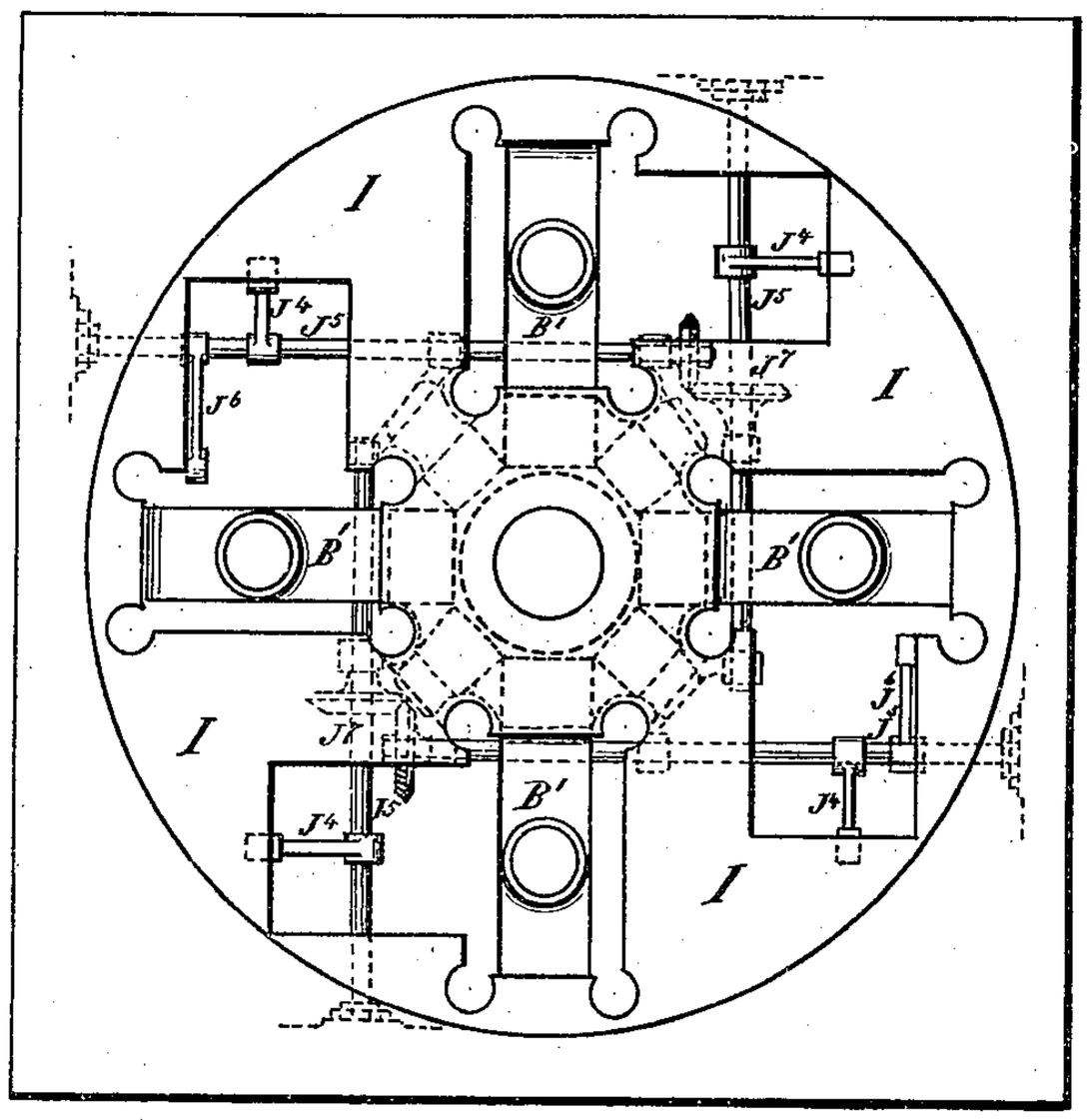
6 Sheets—Sheet 6.

E. HELY.

ENVELOPE MACHINE.

No. 245,493. Patented Aug. 9, 1881.

Fig 6.



Witnesses.

Robt. L. Miller

D. P. Lore

Inventor.

Edward Hely
By Philip T. Dodge
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

EDWARD HELY, OF DUBLIN, IRELAND.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 245,493, dated August 9, 1881.

Application filed April 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HELY, of Dublin, in the county of Dublin, in that part of the United Kingdom called "Ireland," have invented new and useful Machinery for the Manufacture of Envelopes, of which the following is a specification.

This invention is best described by aid of the accompanying drawings. In these Figure 1 is a sectional elevation of the machine; Fig. 2, side elevation, taken at right angles to Fig. 1; Fig. 3, sectional elevation, showing gumming and delivery apparatus; Fig. 4, section through *x x* of Fig. 1; Fig. 5, plan of machine, looking down on it; Fig. 6, view of table. Fig. 7 is a detailed view, illustrating the construction of the gumming device.

A is the main shaft, driven by fast and loose pulleys A′ A′, and carrying cams A^2 A^3 A^4 and miter-wheel A^5. It is carried on bearings A^6 on frame B.

B B′ B^2 B^3 represent the frame-work of the machine.

C is the main spindle, actuated by cam A^4 through roller C′ in frame C^2, collared onto C. As shown C rises and falls, as actuated by cam A^4.

D is a yoke or spider carried on and free to rotate on spindle C, and sliding loosely on spindles E.

E represents plunger-spindles carrying weighted balls E′, and resting on yoke D by means of a collar, as shown in Fig. 1.

E^2 are plungers sliding in bearings E^3.

F is a rotating frame supported on frame-work B^3. Upon this rotating frame are fixed the bearings E^3. This frame has an intermittent motion, and carries forward the plungers E^2 one-eighth of a circle (in this special machine) at each turn.

G is a shaft running in stationary bearings in the frame-work B′ B^2. It is rotated by gearing A^5 G^2.

H is a single-toothed wheel (shown in plan in Fig. 4) working in the roller-teeth of crown wheel or trundle H′. This wheel is kept from rotating by roller H^2, Fig. 4, sliding on bracket H^3, and held to the face-wheel H′ by a spring against the bearing. (Not shown in the drawings.) By a slight modification of these parts the performances of these two parts may be combined in one. As there are eight teeth in the trundle H′, the latter makes one-eighth of a turn at intervals, and causes the eight plungers E^2 to change places.

I is the table upon which the piles of envelope-blanks that have to be folded are laid. It is supported on frame-work B and B^3, and carries, by means of pedestal-bolts I′, the boxes in which the envelopes are folded.

J is a gum-finger. (Seen best in Fig. 3.) This is attached to the plunger E^2, as shown, and passes through bearings on the side of the bearings on the bearings E^3 on spider F. It is free to slide in the bracket fixed to plunger E^2 for about one-eighth of an inch, so as to be slightly in advance of bottom of plunger. It rises and falls synchronously with the plunger E. This gum-finger is formed so as, when smeared with gum, to just gum the bottom flap sufficiently to stick the two side flaps to it. This gumming is effected by coming down upon ledge J′ at the bottom of each alternate stroke when its plunger E^3 is pressing a blank into the box.

J^2 is the gum-reservoir, through which J^3, a rod carrying J′, passes by means of a sleeve, as shown. This J^3 is drawn back into the gum to be rewetted at each stroke by lever-shafts and rods J^4 J^5 J^6, connected by bevel-gearing J^7 from crank A^2.

K K are plungers of the same superficial area as and exactly under plungers E^2, and are worked by cam A^3 by means of pulley K′, brackets K^2, and connecting-castings K^3. Each of plungers K is guided in guides in frame B′, as shown, works in box M, and has two little slots, through which the stationary guides K^4 K^4 pass when the plunger is lowered. These guides K^4 are shown in side section in Fig. 3. They guide the envelopes, when folded, into spout N, hereinafter described.

M M are the folding-boxes supported on pedestal-bolts I′ I′ on table I. There are four of these boxes shown in this machine, and in these boxes the plungers E^2 K slide to and fro as moved by the cams A^4 and A^3 respectively.

M′ M^2 are pivoted flaps for turning over the flaps of the envelope in the side of the box, kept in position shown by springs M^3, except when the rollers M^4 rise against their projecting tappets, to which the springs M^3 are attached. Rollers M^4 are arranged at different heights, so as to turn over one side flap first, then the other side flap, then the bottom flap,

and lastly the top flap. Rollers M^4 are actuated by rods M^6, projecting from bottom frame, M^7, which itself is reciprocated up and down by cam A^2, as shown. These flaps fall back beyond the perpendicular, so that the flaps of the envelope may enter into the spaces thus left and prevent the blank being drawn out by the plunger when rising.

N is the spout down which the envelopes fall into trough O,

O is the measuring-trough. There is a spout, N, and trough O to each folding-box.

P is a ratchet-wheel (on shaft P′) of twenty-five teeth, twenty-five envelopes being put in each bundle. Its pawl is carried on a radial arm from the shaft P′. This arm is worked by links from lever P^2, which is at each stroke of the plungers K propelled down by the projecting tappet P^3 on casting K^3, and is brought back by any convenient spring or its equivalent. (Not shown in the drawings.)

Keyed to the same shaft to which P^2 is keyed are two upright blades, Q Q, passing up into trough O, and placed at such an angle that whenever the lever P^2 is depressed blades Q lie in slots in the trough N, so that an envelope can slide over them; but when P^2 rises the blades Q pass into the position shown in dotted lines in the side view of trough in Fig. 2, and so push forward the envelope into the previous pile.

R is a cam on shaft P′; R′, lever, with pin R^2 working on R and arm and counter-weight R^3 to keep R^2 against cam R. Whenever R^2 falls, which it does when cam R reaches the position shown in Fig. 2, the levers R^4 at each end of shaft R^5 draw forward rods R^6, to which are keyed projections R^7, passing through trough O, as shown in Fig. 2, (left-handed trough,) and thus move forward the pile of twenty-five envelopes, which the attendant takes up and binds in a bundle in the usual manner.

The mode of action is as follows: The apparatus being set in motion by a belt on pulley A′, cam A^4 causes the rod C to rise and lift up the plungers. Those over boxes have their gummed fingers ready with gum. The shaft C now turns round one-eighth of a turn, and the plungers that had previously been over the boxes are now over the pile of blanks on the table, (between guides,) the intermediate plungers taking their places over the boxes. The rod C now descends, and while the plungers over the boxes are lowered into the boxes those over the piles of blanks fall till they rest on the piles of blanks. When the weight is taken off the pile the plungers again turn round one-eighth of a turn. The top blank sticking to the gum-finger moves forward with it till it comes over the box, which is then filled with plunger K, when the plunger descends with it into the box. The sides of the box bend up the four flaps in passing. The upper plunger then rises, and so do the rollers M^4, successively bending over flaps M′ M^2 against plunger F. Plunger K then further descends, and leaves the envelope on guides K^4, which let it slide down N into the trough O, where they are piled into piles of twenty-five, as already explained sufficiently. In the meantime the rollers M^4 descend, the metallic flaps M′ and M^2 fly back, the plunger K rises to the position shown in the drawings, ready for another stroke.

In giving this elaborate description of a machine, I do not mean to confine myself to a rotary type. On the contrary, I am well aware it is not absolutely necessary to have a rotating motion, as by placing all the piles of blanks in a line with the boxes, and by having a series of plungers one more in number than the piles of blanks and the boxes combined, and by giving the plungers a to-and-fro motion the distance of the center of the plunger from the center of a pile of blanks, the machinery would work about as well as if rotary in action; but as I consider the reciprocating plan much worse than the rotary, it is needless to describe it further or depict it.

I claim as my invention—

1. In a machine for folding envelopes, the combination of the traveling plungers E^2 and the gum-fingers J, arranged to rise, fall, and travel synchronously with each other.

2. In an envelope-folding machine, the combination of a series of weighted plungers, E^2, sliding in the yoke D, the rod C, and the cam A^4, whereby all the plungers rise and fall together, but each is at liberty to stop in its course on meeting with an impediment without stopping the fall of the others.

3. In an envelope-folding machine, the combination of gumming devices, substantially as shown, with a series of plungers all connected with and operated simultaneously by the same mechanism, and each descending alternately upon a pile of blanks and into a folding-box.

4. In an envelope-folding machine, the combination of a series of plungers, E^3, with mechanism, substantially such as described, for giving to said plungers or spider an intermittent regulated rotary motion and a vertical-reciprocating motion during the pauses in the rotary motion.

5. In an envelope-folding machine, the combination of plungers E^3, intermittently-rotating frame F, spider D, free to rotate with the plungers, and mechanism, substantially as described, for imparting the intermittent rotary motion, and an intermittent vertical reciprocation to the plungers during the pauses in the rotary motion.

6. In machines for folding envelopes, the combination of the piston or plunger E^3 with its gum-finger J, carrying the blank, the plunger K, the box M, and the cams A^4 A^3, by which the two plungers are caused to descend into the box, and thus bend up the flaps of the envelopes.

7. The combination of the box M, plunger K, flaps M′ and M″, the springs applied to

hold the flaps normally in a raised position, and the reciprocating rollers M^4, arranged as described, to depress the bottom flap and the two side flaps, one after the other, and, finally, the top flap, as described.

8. The combination of the inclined guides K^4, the plunger K, having a horizontal face to sustain the envelopes, and mechanism, substantially as described, whereby the plunger is caused to reciprocate in a vertical path and sink below the inclined guides after the folding of the envelope, substantially as described, whereby the delivery of the envelope from the horizontal surface is effected by means of the stationary guides.

9. The combination, in an envelope-folding machine, of the plungers K, frame K^3, and cams A^3, with their rollers so arranged that all the plungers shall rise and fall simultaneously, being propelled by the same cams.

10. In a gumming apparatus, the combination of the gum-finger J, descending on gum-plate J′, and the oblique rod J^3, so arranged that it shall slide down, when the gum-finger leaves it, into the gum-reservoir and get a fresh film of gum at each stroke.

11. In an envelope-machine, the series of vertically-reciprocating plungers mounted in a horizontally-revolving support or frame, in combination with the wheel H′, having teeth equal in number to the number of plungers, the single-toothed wheel H, and stop H″, said parts being combined with driving mechanism substantially such as described, whereby the plungers are rotated and reciprocated alternately.

12. In a multiple envelope-machine, the combination of a central mechanism, an annular vertically-reciprocating frame, K^3, surrounding the same, and the plungers secured to and operated by said frame, with guides upon the plungers, whereby they are held in position and enabled to maintain the frame in place.

13. In combination with the reciprocating frame K^3, having the plungers attached, the reciprocating frame M^7, provided with the rods M^6, extending past the frame K^3 to the folding devices, substantially as shown.

EDWARD HELY.

Witnesses:
JOHN HOWLETT,
R. J. SLACKE.