

(No Model.)

2 Sheets—Sheet 1.

J. T. & C. T. JONES.

MACHINE FOR MAKING PILLS, LOZENGES, &c.

No. 256,573.

Patented Apr. 18, 1882.

Fig. 1.

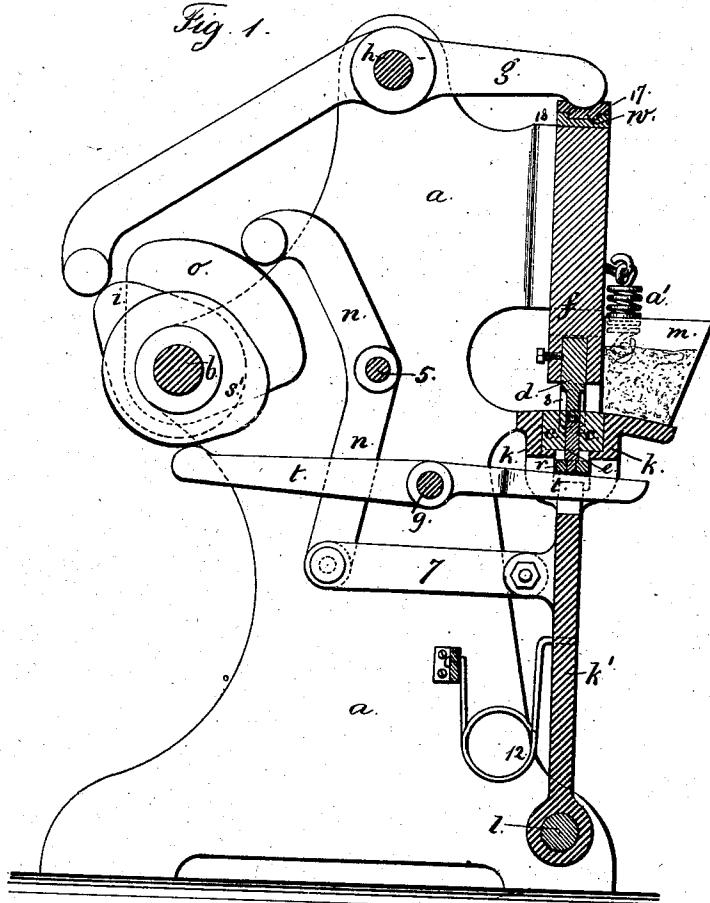
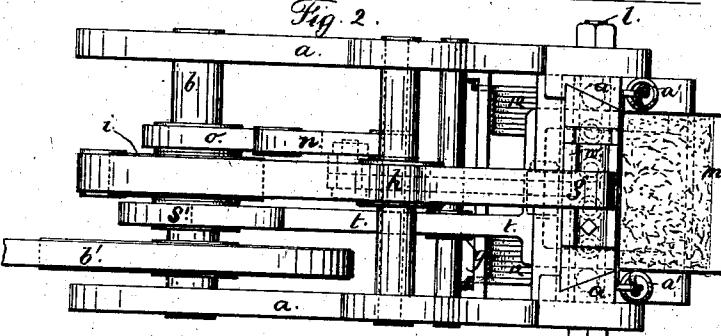


Fig. 2.



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Fig. 3.

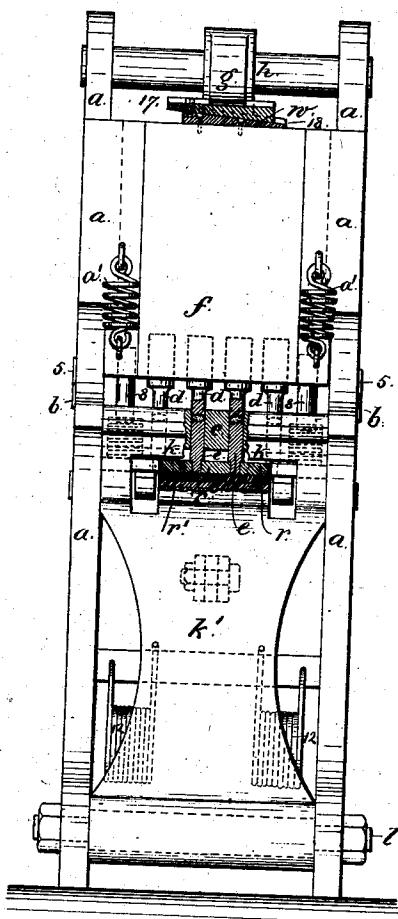
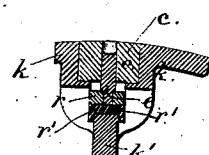


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN T. JONES AND CHARLES T. JONES, OF UTICA, NEW YORK.

MACHINE FOR MAKING PILLS, LOZENGES, &c.

SPECIFICATION forming part of Letters Patent No. 256,573, dated April 18, 1882.

Application filed December 9, 1881. (No model.)

To all whom it may concern:

Be it known that we, JOHN THOMAS JONES and CHARLES T. JONES, of Utica, in the county of Oneida and State of New York, have invented an Improvement in Machines for Making Pills, Lozenges, &c., of which the following is a specification.

Pills have been made by pressure between concave-ended punches within a die, and the lower punch has been lifted to force the pill out from the die. The mechanism for operating the punches is complicated and expensive, and the means for filling the die are not easily applied.

Our invention relates to the mechanism for operating the punches and for moving the dies in such a manner as to fill such dies with the pulverulent material for forming the pills or other articles, and for delivering the compressed pills by the same movement.

In the drawings, Figure 1 is a vertical section of the machine. Fig. 2 is a plan view. Fig. 3 is an elevation partially in section; and Fig. 4 is a cross-section of the die, lifter, and changeable graduating-plate.

The frames *a a* are of the proper size and shape to receive the operative parts. The shaft *b* is revolved by suitable power applied to the pulley *b'* by a crank-handle. The cams upon this shaft *b* operate the respective parts, as hereinafter described. The die-plate *c*, upper punches, *d*, and lower lifters, *e*, are adapted to the manufacture of several pills each complete movement. The drawings represent four sets of punches and dies. These may all be alike, or they may be of different sizes or shapes, as desired. Each die is of the same diameter as the external size of the pill to be made, and the ends of the punch *d* and lifter *e* are concave to form the rounded sides or surfaces of the compressed pill. The punches *d* are set in a head-block, *f*, that slides up and down between the frames *a a*. Such head-block and punches are lifted preferably by a spring or springs, *a'*, and forced down by the lever *g*, that is pivoted at *h* and moved by the cam *i* upon the shaft *b*.

The shape of this cam *i* is such that it will move the punches downwardly at the proper time and press the pills with a powerful pressure and then relieve the pressure, so that the punches *d* will be in an elevated position while

the other operations are being performed. The die-plate *c* is within the segmental die-holder *k*, the upper surface of which is a curve described from the shaft *l*, that forms an axis 55 on which such die-holder can be swung back and forth beneath the powder-holder *m*.

The arm *k'* extends from the die-holder *k* to the axis *l*. The lever *n* on the fulcrum 5 is connected to the die-holder arm *k'* by the link 60 7, and the cam *o* upon the shaft *b* gives motion to the lever to swing the die-holder at the proper time in one direction, and the springs 12 move the die-holder in the other direction.

The lifters *e* are in a bar, *r*, that passes 65 across below the die-holder *k*, and this bar *r* is in a groove in the die-holder beneath the die-plate, and *t* is a lever on the fulcrum *q*, that is preferably formed as two parts, or with forked ends beneath the bar *r*. The cam *s'* 70 acts upon this lever *t* to move the same and raise the lifters *e* and deliver the pills at the proper time.

The movement of the die-holder brings the pill-dies beneath the powder in the holder *m*, 75 the lifters *e* at that time being pressed or drawn down, so that each hole in the punch-plate *c* receives the proper amount of powder for a pill. The surplus powder is kept back by the edge of the powder-holder *m* scraping off such powder.

Guide-pins 8 on the head *f*, and having tapering ends, may be provided to enter holes in the die-plate *k* to insure the proper position of the dies to the punches. The punches *d* descend and press the pills, after which the lifters *e* and bar *r* are raised to discharge the compressed pills, and these pills are carried toward the delivery edge of the holder *k* by the said holder moving beneath said pills while the latter rest against the outside of the powder-holder. By this movement the pills are pressed away from the die-holes. As the die-holder *k* is carried back from beneath the powder-box the pills are moved, with the holder *k*, and roll 90 from its surface or slide into a receptacle.

The extent of downward movement of the lifter-bar *r* is determined by a changeable graduating-plate *r'*, applied below the lifter-bar and resting directly upon the metal of the arm 100 *k'*, to limit the downward movement of the lifters and form a firm support to them while the

pills or other articles are being pressed. By changing this graduating-plate the dies may be adapted to receive more or less of the powdered material by raising or lowering the lifters *e*.

It is necessary to adjust the movement given to the upper punches, so as to regulate the amount of compression to which the pills are subjected. To accomplish this object we employ the adjustable bearing *w* at the head-block *f*, said bearing being composed of the two inclines 17 and 18, the upper incline being movable endwise on the lower incline and held by a set-screw, so that with a uniform movement given by the cam *i* to the lever *g* the punches *d* will be caused to reach a lower position in pressing the pills, if the distance between the lever *g* and the faces of the punches be increased by the inclines 17 and 18, and the reverse if the inclines are moved the other way.

Inclines similar to the inclines 17 and 18 may be used in place of the changeable graduating-plate to allow the lifters to descend to a greater or less extent.

25 All the movements in this machine are given from one revolving shaft and its three cams. Hence the mechanism is simple, cheap, and durable.

We remark that the springs may be dispensed with if grooved cams are employed.

By removing the punches *d*, die-plate *c*, and lifters *e* others may be substituted adapted to make pills, lozenges, or other articles of different forms. No other parts of the machine 35 require to be changed.

We claim as our invention—

1. The combination, in a pill-machine, of the die-plate *c*, segmental die holder *k*, powder-holder *m*, punches *d*, lifters *e*, and their sup-

porting and actuating devices, substantially as set forth.

2. The combination, in a pill-machine, of the die-plate *c*, the segmental die-holder *k*, arm *k'*, and shaft *l* for said die-holder, the lifters *e*, bar *r* below the die-plate, the lever *t*, and cam *s'* for raising the lifters, substantially as set forth.

3. In a pill-machine, the combination, with the segmental die-holder and dies, of the powder-holder *m*, the pressing-punches *d*, lifters *e*, and means for swinging the segmental die-holder for the delivery of the compressed pills and the reception of powder, substantially as set forth.

4. The combination, in a pill-machine, of a swinging segmental die, pressing and delivery punches, a driving-shaft, cams, and levers operating to swing the segmental die and actuate the punches and lifters respectively, substantially as set forth.

5. The combination, with the punches and head-block in a pill-machine, of the cam and lever for moving the same, and the adjustable bearing between the lever and the head-block, substantially as set forth.

6. The combination, with the segmental die-holder and die, the pressing-punches, the lifters, the bar for the same, the changeable graduating-plate, and the mechanism for giving motion to the dies, punches, and lifters respectively, substantially as set forth.

Signed by us this 30th day of November, A. D. 1881.

JOHN T. JONES.
CHAS. T. JONES.

Witnesses:

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THOS. D. LEWIS.