T. J. YOUNG.

MACHINE FOR MAKING PILLS, LOZENGES, &c.

No. 189,005. Patented March 27, 1877.

Fig: 1.

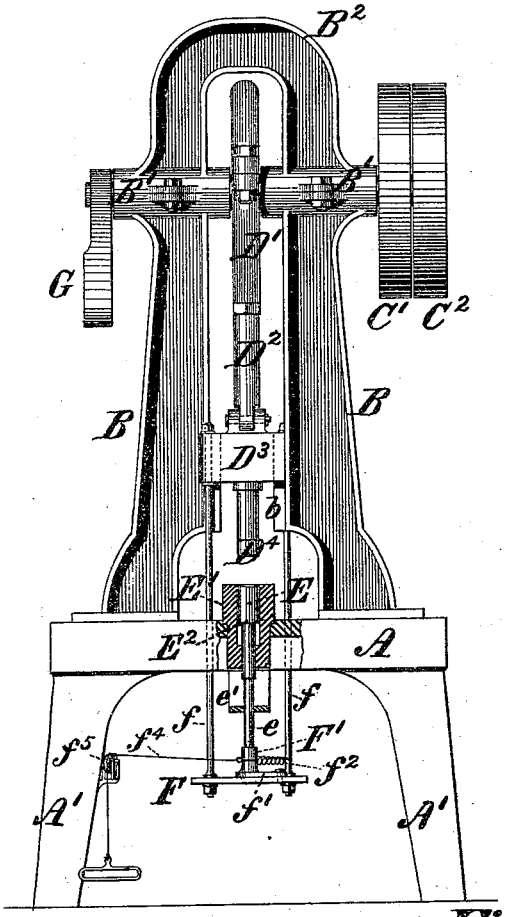

Fig: 2.

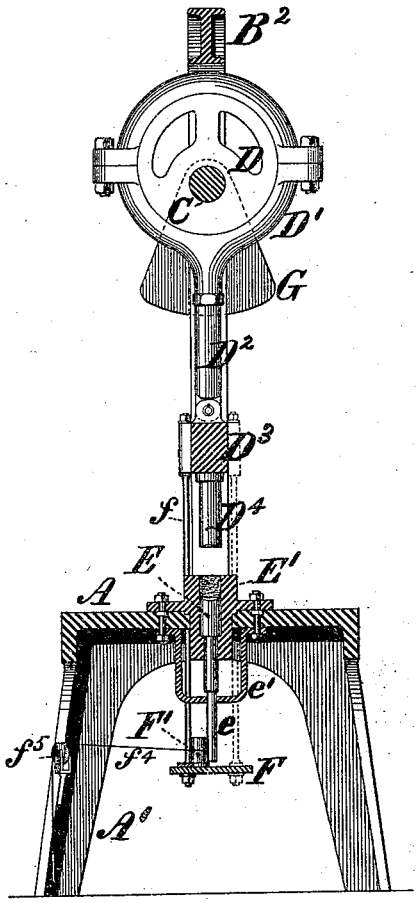

Fig: 3.

Witnesses

Geo. A. Vaillant.

F. E. Harding.

Inventor

Thos. J. Young

by J. Snowden Bell,

Attorney.

UNITED STATES PATENT OFFICE.

THOMAS J. YOUNG, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HENRY BOWER, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR MAKING PILLS, LOZENGES, &c.

Specification forming part of Letters Patent No. **189,005**, dated March 27, 1877; application filed March 9, 1877.

To all whom it may concern:

Be it known that I, THOMAS J. YOUNG, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Pills, Lozenges, &c., of which the following is a specification:

My invention relates to that class of pill-machines in which dry powders are compressed between a reciprocating plunger or upper die and a lower die, which is stationary during the operation of compression, and movable thereafter to act as an ejector for the finished product from the mold or socket within which it is formed.

Letters Patent of the United States for a machine of this description were granted and issued to Henry Bower, of Philadelphia, as my assignee, said Letters Patent being numbered 156,398, and bearing date October 27, 1874.

The object of my present invention is to provide improved means for elevating and depressing the lower die, and for preventing the descent of the upper die during the operation of charging the mold; to which ends my improvements consist in the combination of a lower die, having a downwardly-projecting stem, with a lifter connected to the cross-head of the upper die, and provided with a movable ejector-block, and also in the combination of a lower die, which rests upon the bottom of its socket or mold during the operation of charging the same, with an upper die operated by a balanced eccentric upon an intermittently-rotating shaft, all as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a side view, partly in section, of a machine embodying my improvements; Fig. 2, a vertical transverse section through the same; and Fig. 3, a plan view, on an enlarged scale, of the lifter and ejector-plate.

The machine is supported upon a table, A, which rests upon feet A′, and serves as a bed-plate, to which are secured vertical housings B, having bearings B^1 at top, and connected by an arched cap, B^2. A driving-shaft, C, is mounted in the bearings B^1, and is intermittently rotated, either by means of the clutch described in Letters Patent No. 156,398 aforesaid, by fast and loose pulleys C^1 C^2, or by some other suitable device.

The means of obtaining such intermittent movement need not, however, be here specifically described, as they do not *per se* constitute any part of my present invention.

A pressing-eccentric, D, is secured upon the driving-shaft C, between the housings, its strap D^1 being connected by a rod, D^2, with a cross-head, D^3, sliding upon guides *b b* on the inner faces of the housings. The cross-head D^3 carries the upper die or plunger D^4, the form and size of which is governed by that of the article to be produced. The lower die E rests in a mold or socket, E^1, concentric with the upper die, within which socket the material is compressed at each downward movement of the latter. A shoulder, E^2, formed upon the lower die E, rests upon the bottom of the socket E^1 during the operation of compression, below which shoulder a central stem, *e*, on the die projects downward, and passes through a guide, *e′*.

The lower die is elevated to discharge the finished pill at each upward movement of the cross-head by a horizontal lifter, F, below the table A, which lifter is connected to the cross-head by lifter-rods *f f*, passing freely through the table. An ejector-block, F′, is secured upon an arm, f^1, pivoted to the lifter F. The block is held in line with the stem *e* of the lower die E by a spring, f^2, and stop f^3, and can be moved out of line with the stem, when required, by a hand-lever, or by a cord, f^4, passing over a sheave, f^5, on one of the legs of the frame. When the lifter F is at the lowest point of its traverse, the ejector-block is in line with and just below the lower end of the stem *e* of the lower die E, and upon the upward movement of the cross-head the lifter and block elevate the die into the position shown in Fig. 1, and thereby eject the finished pill from the socket E^1. When the cross-head has reached the upper extremity of its traverse the movement of the shaft C is arrested, and the finished pill being removed the ejector-block is swung clear of the stem of the lower die, as shown in dotted lines in Fig. 3, and the die E drops, by the action of gravity, into

the position shown in Fig. 2, when the socket receives a fresh charge of material, the lifter F descending simultaneously with the upper die. When the shaft is again rotated, the spring f^2 will return the ejector-block F′ at the lower end of the stroke to its position beneath and in line with the stem *e*, and the operation of ejection will be repeated on the next upward stroke.

Where the lower die is of very small dimensions, it may become necessary to attach a small additional weight to its stem to insure its proper downward movement; but in general the weight of the die and stem will be found to be sufficient.

In order to prevent injury to the hand of the operator by the accidental descent of the upper die during the charging of the socket, the eccentric and its connections are retained in position at the upper end of the stroke by a counter-balance, G, secured upon the shaft, or upon the eccentric, if preferred, so as to act in opposition to the downward tendency of the pressing mechanism, and prevent any material movement of the same until the driving-shaft is started in rotation for another compression.

I claim as my invention, and desire to secure by Letters Patent—

1. The combination, in a machine for making pills, lozenges, &c., of a lower die, having a downwardly-projecting stem, a lifter connected to and moving with the cross-head of the uprer die, and an ejector-block, movable upon the lifter into and out of line with the stem of the lower die, substantially as set forth.

2. The combination of a lifter, a movable ejector-block, a spring and stop, and an operating cord or rod, substantially as set forth.

THOMAS J. YOUNG.

Witnesses:
J. SNOWDEN BELL,
JOSEPH VERNER.