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PATENTED AUG. 22, 1905.

J. F. BUCKLEY.
TABLET MOLDING PRESS.
APPLICATION FILED MAR. 8, 1905.

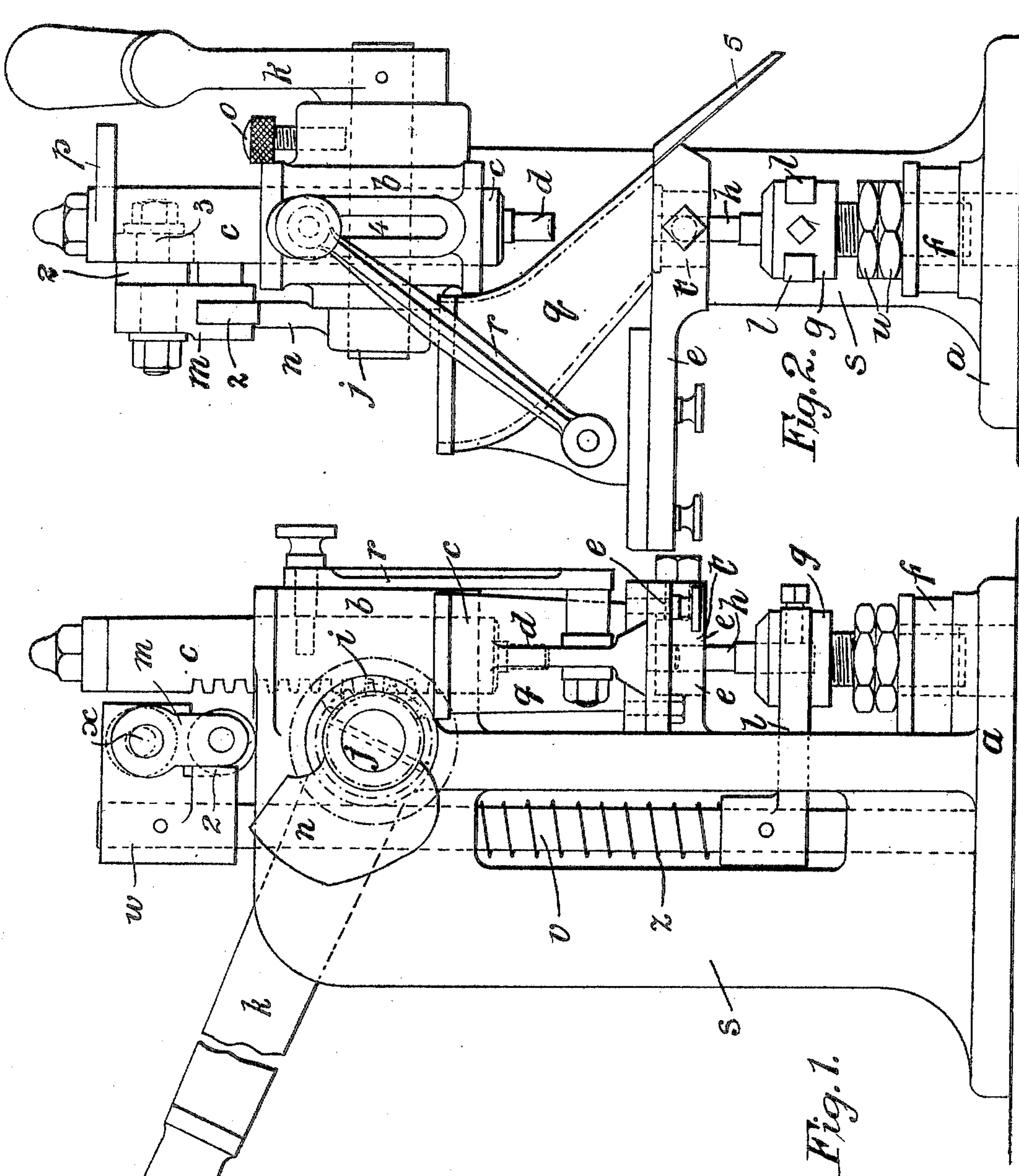


Fig. 1.

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JAMES FRANCIS BUCKLEY, OF ILFORD, ENGLAND.

TABLET-MOLDING PRESS.

No. 797,838.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed March 8, 1905. Serial No. 249,108.

To all whom it may concern:

Be it known that I, JAMES FRANCIS BUCKLEY, a subject of the King of Great Britain and Ireland, residing at 26 Meath road, Ilford, in the county of Essex, England, have invented a certain new and useful Improved Tablet-Molding Press, of which the following is a specification.

This invention relates to molding-presses, preferably of the hand-operated type, and has for its object the production of a press whereby tablets varying in thickness from the thinnest wafer to a comparatively thick lozenge may be compressed into any given uniform thickness and density at the will of the operator in a very efficient manner.

The invention relates more particularly to a press by the operation of which the tablet material is first fed into the recessed part of a die from a movable hopper, then compressed to the proper density and thickness by the downward movement of a plunger, which is next withdrawn and followed up by a plunger beneath the tablet which in rising ejects the finished tablet ready for discharge by the next forward movement of the feeding-hopper.

According to the present invention the reciprocation of the compressing-plunger is effected by rack-and-pinion gear from an oscillating shaft, which on its return oscillation operates the ejecting-plunger to cause the tablet to be ejected, the compressing-plunger also operating a movable hopper, adjustments being provided whereby the thickness and density of the tablet may be accurately predetermined.

The invention will now be described with reference to the accompanying drawings, wherein—

Figures 1 and 2 show side and front elevations, respectively, of a press constructed according to the invention.

A base-plate *a* is suitably secured to a work-bench or other suitable foundation, and projecting upward therefrom is a standard *s*. The upper end of said standard is provided with an overhanging portion *b*, vertically bored to receive a reciprocating compressing-plunger *c*. At its lower end the plunger is adapted to receive a punch *d* of a diameter corresponding to the size of tablet to be made. Projecting from about the middle of the standard *s* is a bracket *e*, which is adapted to receive a die *t*, centrally bored to receive the upper end of a lower punch *h* and in alinement with the upper punch *d*. The cross-sections of the

upper and lower punches are made to correspond and accurately fit the similarly-shaped hole in the die *t*.

Formed integrally with the lower end of the standard and the base-plate is a boss *f*, in which the lower end of the holder *g*, carrying the lower punch, is adapted to work. The lower part of the holder *g* is threaded to receive two lock-nuts *u*, the lower one forming an adjustable stop to limit the downward movement of the punch *h*. The punch *h* in its upward movement always reaches the top of the die, even if the depth to which it is allowed to fall is varied.

A number of rack-like teeth are formed on one side of the plunger *c* and are caused to engage with a toothed pinion *i*, mounted on the transverse shaft *j*, journaled in suitable bearings at the upper end of the standard *s*. A hand-lever *k* is secured at one end of the shaft *j*, so that a movement of partial rotation may be imparted to the pinion *i*, to thereby reciprocate the plunger *c* and therewith the punch *d*. Secured at the other end of the shaft *j* is a cam *n*, which by means to be now described serves to actuate the lower punch or ejecting-plunger *h*.

The holder *g* of the lower punch is slotted on two sides to receive the forked ends of an arm *l*, secured in any suitable manner to a vertical rod *v*. The upper and lower ends of this rod are guided in the standard *s*, and the arm *l* is also guided in the front portion thereof by means of a slot or otherwise. A block *w* is secured to the upper end of the rod *v*, and a swinging link or pivoted tappet *m* is suspended from an eccentrically-mounted cross-pin *x*, mounted in a forward extension of the block *w*. The link or tappet *m* carries an antifriction-roller at its lower end for engagement with the cam *n*, mounted upon the shaft *j*. When the cam *n* makes a forward oscillation, it causes the link or tappet *m* to swing freely on its pin *x* and no action is effected; but when the cam makes a rearward oscillation the link is prevented from swinging by means of the shoulder 2 and is therefore raised, at the same time raising the block *w*, shaft *v*, arm *l*, holder *g*, and lower punch *h*. The height to which the punch may be raised is regulated with great nicety by setting the eccentrically-mounted pin *x* to the desired position. The shaft *v* is returned to normal position by the spring *z*.

It will be seen from Fig. 1 that a portion of the periphery of the cam *n* is made concen-

tric to form a "dwell" in the movement of the cam, during which period the hopper *q*, containing the tablet material, is actuated. The hopper *q* is mounted and adapted to slide in guides upon the bracket *e*, and the movement of the plunger *c* is communicated to the hopper by a diagonal connecting-rod *r*. The extension *b* of the standard *s* is slotted at 4, and the pin at the upper end of the link *r* passes through the slot and is attached to the plunger *c*. Thus as the plunger moves downward the hopper *q* is moved backward out of its path and forward when the plunger rises. The downward movement of the plunger *c* is regulated by a stop *o*, screwed to the desired depth into the top of the extension *b*, the said stop engaging with a lug *p*, projecting from the upper end of the plunger. By this adjustment the density or the thickness of the tablet is regulated.

The operation of the machine is as follows: With the parts in the position shown the hopper *q* is in the forward position, so that a suitable quantity of the material to form the tablet may drop into the recess left in the die *t* by the lower punch assuming its lowest position. By pulling forward the hand-lever the upper punch is moved downward and simultaneously pushes back the hopper *q*, the punch at the end of its movement entering the recess in the die and compressing the tablet material therein to the finished size against the stationary lower punch. The backward movement of the hand-lever now takes place, whereby the upper punch is raised and is followed up by the lower punch, which is now actuated by the cam-gear, as described. Both plungers move together till the top of the lower plunger is flush with the surface of the bracket *e*, and the lower plunger then stops, owing to the dwell of the cam, while the upper plunger still moves upward, at the same time causing the hopper to move forward to slide the finished tablet onto a discharge-chute 5. In the meantime the cam has passed from beneath the block *w*, allowing the same and the lower punch to drop, ready for the next operation.

By means of the adjustments hereinbefore referred to the press can be set to produce tablets of uniform density, but of different thicknesses, varying from the thinnest wafer to a comparatively thick lozenge, or the density may also be varied.

It is to be understood that the invention is not limited to the precise construction of molding-press shown and described, but that any equivalent mechanism may be used which will effect a similar sequence of operations.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a tablet-molding press comprising a compressing-plunger, a die, an ejecting-plunger and rack-and-pinion gear for reciprocating the compressing-plunger, the combina-

tion of a cam on the pinion-shaft adapted to engage with a tappet, connected with the ejecting-plunger and means for limiting the downward stroke of the compressing-plunger, said cam being constructed with a dwell portion thereon for limiting the effective movement of said ejecting-plunger, substantially as and for the purpose hereinbefore set forth.

2. In a tablet-molding press comprising a compressing-plunger, a die, an ejecting-plunger and rack-and-pinion gear for reciprocating the compressing-plunger, the combination of a cam on the pinion-shaft, a rod connected with the ejecting-plunger and a tappet on said rod adapted to be engaged by the aforesaid cam, the latter being constructed with a dwell portion thereon for limiting the effective movement of said ejecting-plunger, substantially as and for the purpose hereinbefore set forth.

3. In a tablet-molding press comprising a compressing-plunger, a die, an ejecting-plunger and rack-and-pinion gear for reciprocating the compressing-plunger, the combination of a rod connected with the ejecting-plunger, a tappet pivoted upon the head of said rod, a shoulder on the head at one side of the tappet, and a cam on the pinion-shaft adapted to engage the tappet, constructed with a dwell portion thereon for limiting the effective movement of said ejecting-plunger substantially as and for the purpose hereinbefore set forth.

4. In a tablet-molding press comprising a compressing-plunger, a die, an ejecting-plunger and rack-and-pinion gear for reciprocating the compressing-plunger, the combination of a rod connected with the ejecting-plunger, a tappet pivoted on a pin on the head of said rod, said pin being adjustable, a shoulder on the head at one side of the tappet and a cam on the pinion-shaft adapted to engage the tappet, substantially as and for the purpose hereinbefore set forth.

5. In a tablet-molding press comprising a compressing-plunger, a die, an ejecting-plunger and rack-and-pinion gear for reciprocating the compressing-plunger, the combination of a rod connected with the ejecting-plunger, a tappet pivoted on a pin eccentrically mounted in the head of said rod, means for limiting the oscillation of the tappet, a cam on the pinion-shaft adapted to engage said tappet for the purpose of moving the rod in one direction and a spring for returning said rod in the reverse direction, substantially as and for the purpose hereinbefore set forth.

6. In a tablet-molding press comprising a compressing-plunger, a die, an ejecting-plunger and rack-and-pinion gear for reciprocating the compressing-plunger, the combination of a rod connected with the ejecting-plunger, a tappet pivoted on a pin eccentrically mounted in the head of said rod, means for limiting the oscillation of the tappet, a cam on the

pinion-shaft adapted to engage said tappet for the purpose of moving the rod in one direction and a spring for returning said rod in the reverse direction and a lug on the compressing-plunger adapted to engage an adjustable stop on the framework of the machine, substantially as and for the purpose hereinbefore described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES FRANCIS BUCKLEY.

Witnesses:

ALBERT E. PARKER,
A. W. MATHYS.