

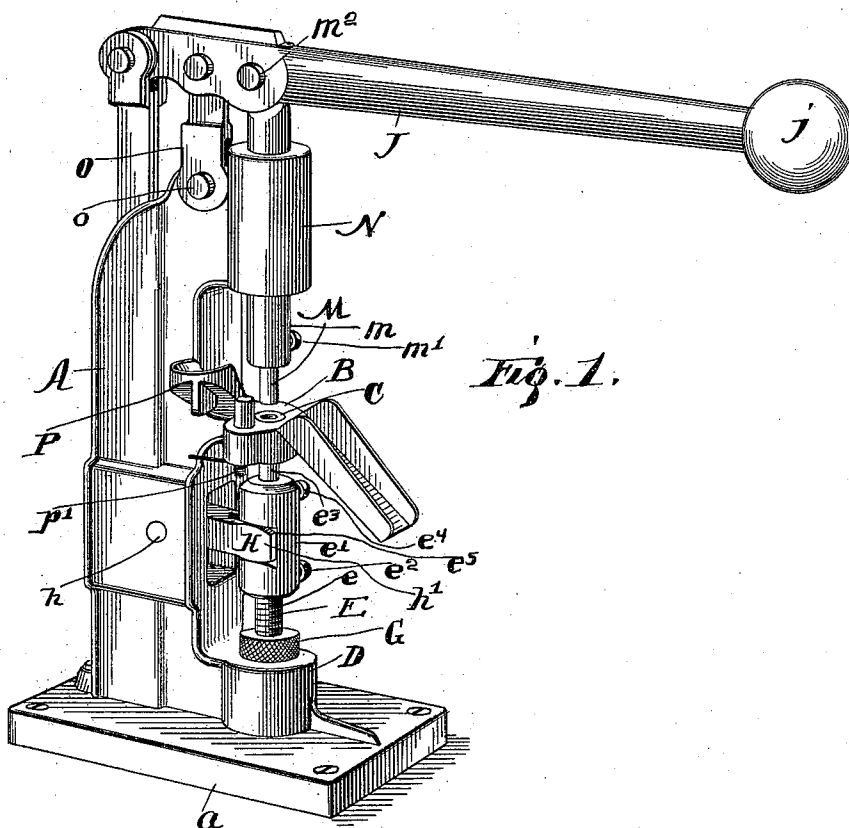
(No Model.)

4 Sheets—Sheet 1.

W. FRECK.
TABLET MACHINE.

No. 599,601.

Patented Feb. 22, 1898.



Witnesses:
Chas. O. Hervey
R. O. Bailey

Inventor:
William Freck
by Wm. M. Bittner
His Atty.

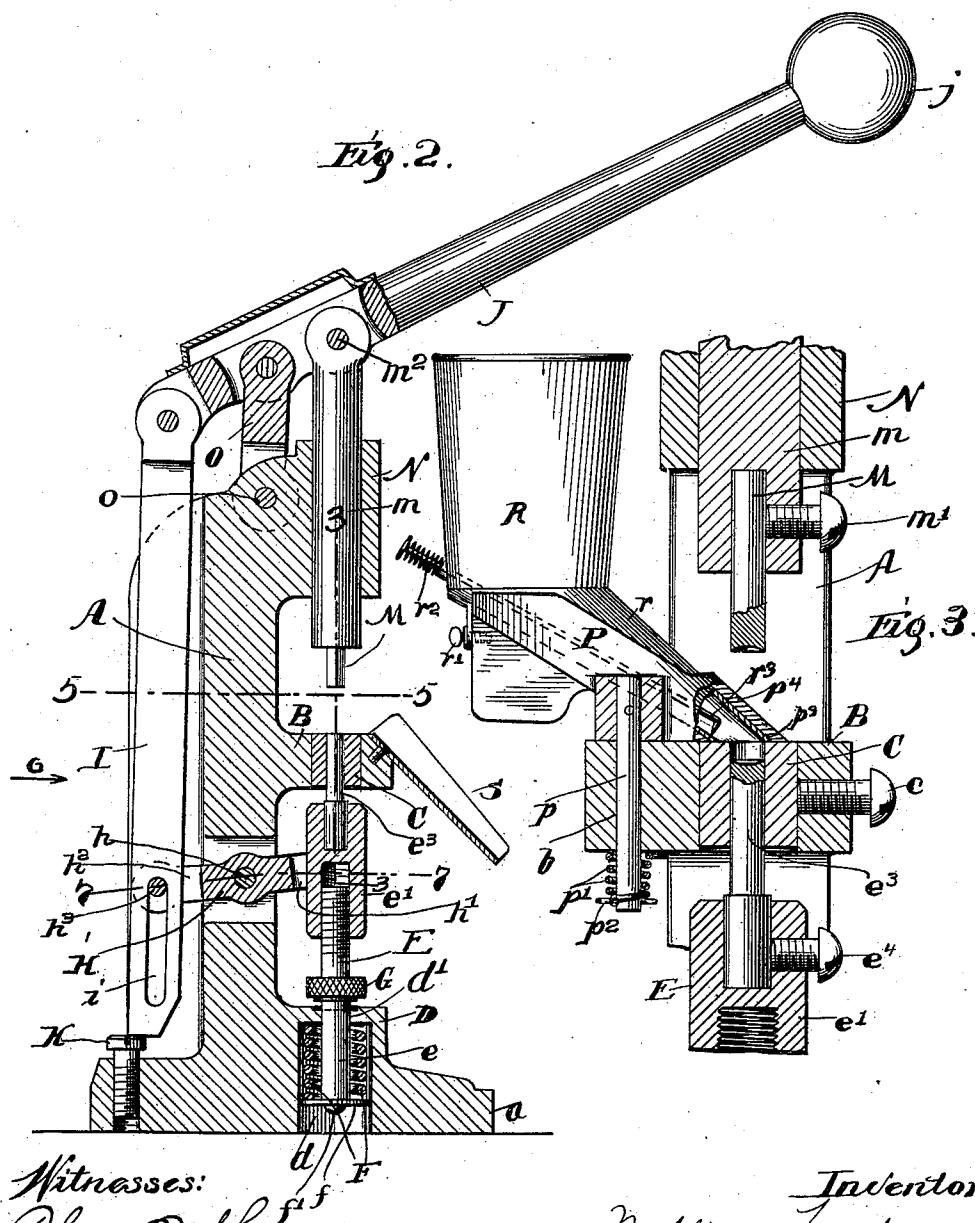
(No Model.)

4 Sheets—Sheet 2.

W. FRECK.
TABLET MACHINE.

No. 599,601.

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Witnesses:
Chas. D. Sherway
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Fig. 4.

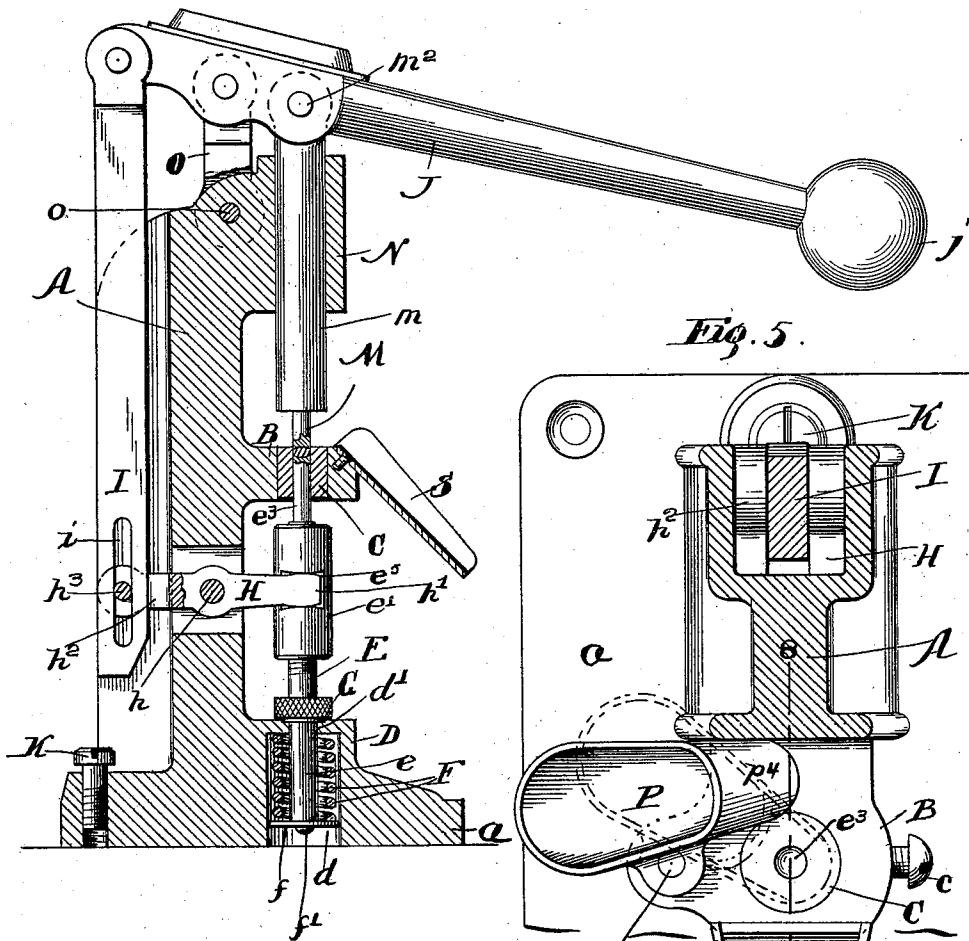
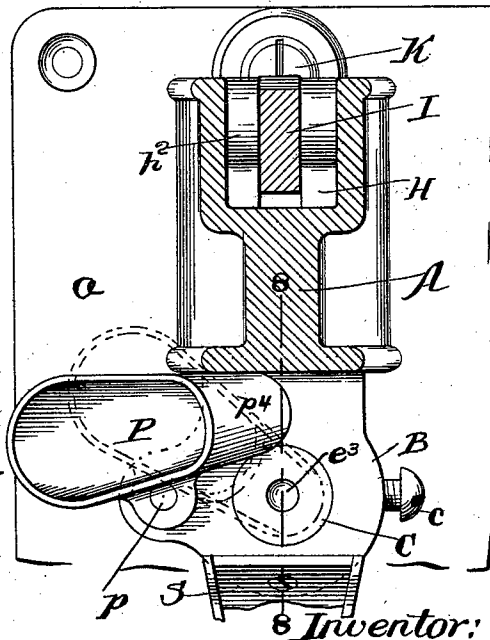


Fig. 5.



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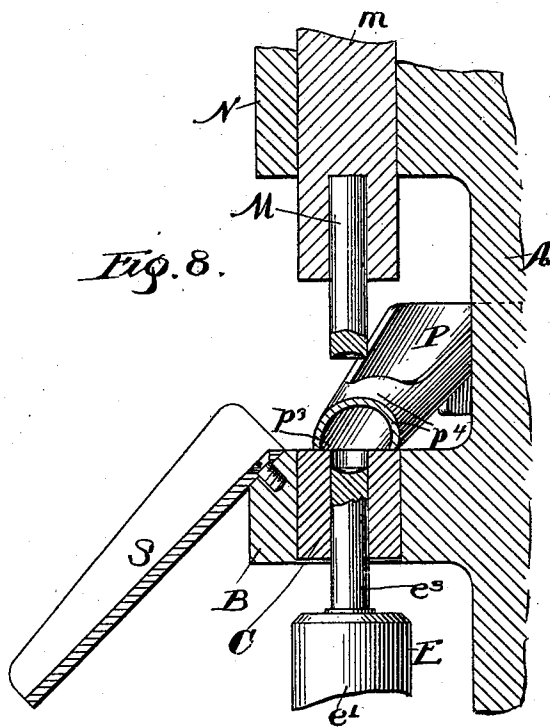
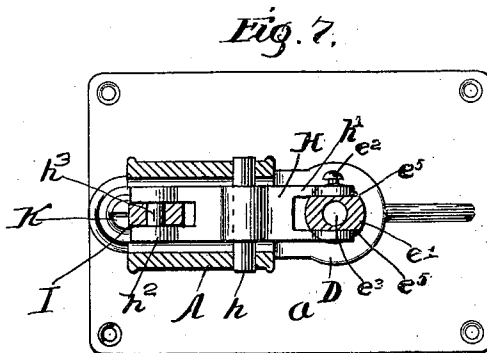
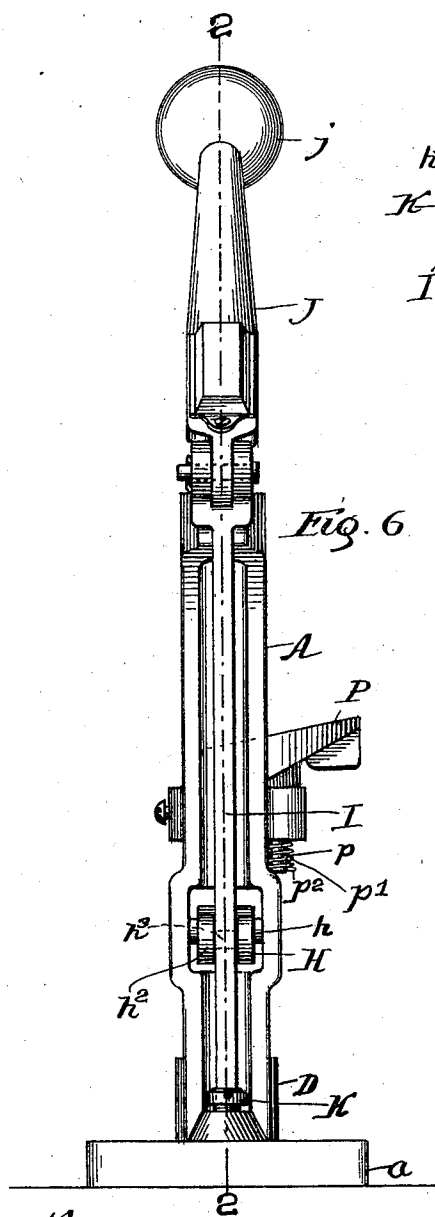
(No Model.)

4 Sheets—Sheet 4.

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No. 599,601.

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UNITED STATES PATENT OFFICE.

WILLIAM FRECK, OF CHICAGO, ILLINOIS.

TABLET-MACHINE.

SPECIFICATION forming part of Letters Patent No. 599,601, dated February 22, 1898.

Application filed March 15, 1897. Serial No. 627,604. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FRECK, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tablet-Machines, of which the following is a specification.

My invention relates to improvements in tablet-machines of the class adapted especially to the use of the retail druggist and intended particularly to form physicians' prescriptions of powdered material into tablets of any desired weight.

To this end the machine comprises a suitable frame or standard, a bracket supported on the standard and formed with a preferably vertical socket or die, a lower compressor vertically adjustable in the die for the purpose of varying the amount of material received in the upper end of the latter to form the tablet, a vertical movable upper compressor adapted to compress the material into a tablet, means for operating the upper compressor to form the tablet, means for operating the lower compressor to eject the tablet, and a suitable supply vessel resting upon the upper face of the bracket and adapted to be oscillated thereon, this supply vessel being formed with a downward opening adapted when in one position to deliver the material to the die. The lower compressor, the means by which it is adjusted, and the means by which it is operated for ejecting the tablet are all so constructed and combined that no matter what the adjustment of the compressor may be its upward movement in the ejection of the tablet brings its upper end exactly flush with the upper face of the bracket, thereby bringing the tablet invariably into position to be swept away by the oscillation of the supply vessel and at the same time leaving no possibility of collision between the supply vessel and the compressor. This is a most important feature of construction, which will be pointed out and explained in detail in this specification.

The entire invention is hereinafter fully described and explained, and it is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a perspective of an entire machine, illustrating the various features of my invention in its preferred form. Fig. 2 is a

central vertical section in the line 2 2 of Fig. 6, showing the operating-lever at the upper limit of its movement. Fig. 3 is an enlarged detail vertical transverse section in line 3 3 of Fig. 2, showing the plunger at its lowest position, but showing in addition a supplementary supply-hopper used when making up large quantities of tablets. Fig. 4 is a view similar to Fig. 2, with the exception that the operating-lever and certain other parts operated thereby are in different positions from that shown in Fig. 2. Fig. 5 is an enlarged detail horizontal section in line 5 5 of Fig. 2. Fig. 6 is an end elevation looking in the direction of the arrow 6 in Fig. 2. Fig. 7 is a horizontal section in line 7 7 of Fig. 2; and Fig. 8 is a detail vertical section in line 8 8 of Fig. 5, the position of the hopper being changed and the view being upon a larger scale than that of Fig. 5.

Looking at the drawings, the frame or standard is seen at A and has a flat base *a*, provided with screw-holes to enable it to be securely fastened upon a bench or counter. The bracket supported upon the frame is seen at B and contains a die C to receive the powder and confine it while it is being compressed into a tablet. The cross-section of this die is determined by the shape of the tablet desired, and the die is held in the bracket by means of a set-screw *c*, so that it may be easily removed and replaced by another of different shape whenever desired. Directly beneath the die a boss or a barrel D is formed upon the base, and said boss is bored from the bottom to form an upwardly-projecting socket *d*, in the top of which is bored a smaller hole *d'*, concentric with the axis of the die. A plunger E, which I will call for convenience the "lower" compressor, is arranged to reciprocate vertically, being guided in the die at the upper end and in the hole *d'* at the lower end. As seen here, this lower compressor is made up of three parts—namely, a rod *e*, working vertically in the hole *d'*, a collar *e'*, internally threaded to engage an external thread upon the top of the rod and secured against rotation upon the latter by means of a set-screw *e''*, and a plunger proper, which I will call the "lower" plunger *e'''*, the top of which is fitted within the die C and is guided therein during its verti-

cal reciprocation and the bottom of which slips into the collar e' and is held therein by means of a set-screw e^4 . Within the socket d the rod d' is encircled by a spiral spring F, confined between the top of the socket and a washer f , secured upon the bottom of the rod, a screw f' being here shown to answer such purpose. The tension of the spring is exerted to draw the lower compressor downward, and the extent of such downward movement is limited by means of a knurled nut G, threaded to the rod d' , so that it may be screwed up or down upon the same to adjust the lower compressor. The collar e' is notched upon opposite sides, as seen at e^5 , and a vertically-oscillating lever H, pivoted in the frame at h , is provided upon its forward end with a fork h' , embracing the collar and fitting loosely in the notches thereon, so as to reciprocate the lower compressor vertically whenever the lever is oscillated upon its pivot. The rear end of the lever is also forked, as seen at h^2 , and carries a pin h^3 , working in a slot i in a pitman I, pivoted at the top to an operating-lever J and adapted to be vertically reciprocated by said lever. The downward movement of the pitman is limited by means of a stop K, here shown as consisting of a screw threaded in the base a and vertically adjustable therein.

Above the die and concentric with the axis thereof is an upper compressor made up of a second plunger M, which for convenience I will call the "upper" plunger, and which is also fitted to the die C, so that as it enters the latter it may crowd the powder downward and compress it into a solid tablet, and a head m , in which is held the upper plunger, by means of a set-screw m' , the head being vertically guided in a second bracket N, supported by the standard or frame. A portion of said head which extends above said bracket is pivoted to the operating-lever at m^2 , and between said pivot and that of the pitman I the lever is pivoted upon the upper end of a link O, the lower end of which is forked and pivoted upon the frame at o . This link allows the lever-pivot therein a slight movement forward and back with respect to the frame, the same being rendered necessary by the head m , which is vertically guided in the bracket N.

Upon the upper face of the bracket B an oscillating supply vessel or hopper P is pivoted by means of a vertical pin p , extending down through a vertical hole b in the bracket and provided below the same with a coiled spring p' , resting at the bottom upon a split pin p^2 and pressing at the top against the bottom of the bracket. This spring holds the hopper closely upon the upper surface of the bracket without causing undue friction thereon. The lower end of the spring is turned about the pin, as seen in Fig. 3, and the upper end engages the frame, as seen in Fig. 1, so that the torsion of the spring tends to hold the hopper in the position seen in Fig. 5, where the discharge-opening in the hopper

is out of register with the die. The interior of the hopper is preferably made sufficiently large to hold an ordinary prescription, and its bottom slants downwardly to an opening p^3 at such a distance from the pivot that by swinging the hopper upon the latter said opening may be brought directly over the die C to allow the contents of the hopper to fall downward and fill the same. If the contents do not fall readily, the hopper may be rapped slightly against the frame of the machine. The lower sides of the hopper are connected by a hood p^4 , the object of which will be hereinafter described.

The lever J is of sufficient length to give a considerable purchase and is provided with a handle j of convenient size and form to be grasped by the hand. The downward movement of the handle lowers the upper compressor into the die and raises the pitman I, the latter sliding upward upon the pin h^3 and being guided thereby at its lower end. The raising of the handle withdraws the upper compressor from the die and lowers the pitman I. When the pin h^3 reaches the top of the slot, the lever H is oscillated upon its pivot and the lower compressor is raised thereby until the lower end of the pitman strikes the head of the screw K. By adjusting this screw the limit of movement is so fixed as to bring the top of the lower compressor just flush with the top of the die. This adjustment is necessary only when the machine is first set up or thereafter when the lower plunger is taken out and replaced with one of different length. It should be noticed that this adjustment is entirely independent of any vertical adjustment of the lower plunger, as the screw K limits the downward movement of the pitman I, which fixes the lowest possible position of the pin h^3 and thereby determines the highest possible position of the lower compressor, and every time the handle is raised to its limit the pitman I will bring the pin h^3 down to the same point, no difference where it happens to find it in its downward stroke. When the handle is lowered slightly from its highest position, so as to relieve the pin h^3 , the lower compressor may be adjusted vertically by means of the nut G, which determines the limit of said compressor's downward movement.

In the use of one of these machines the druggist compounds his prescription, weighs out a portion thereof sufficient to form a tablet of the desired size, and places such portion carefully in the die C, lowering the lower compressor, if necessary, by means of the nut G. When he has placed it within the die, he then carefully raises the lower compressor until the top of the loose powder in the die is brought just flush with the upper surface of the latter. He then pours the remainder of the prescription into the hopper P and is ready to make the same up into tablets. The handle is brought down, compressing the powder in the die into a tablet, and then raised as

far as it will go, which lifts the tablet up until its under side is just flush with the top of the bracket and die. The hopper is then oscillated upon its pivot to bring the opening in its bottom over the die, and in doing so the finished tablet, which rests upon the top of the lower compressor, is pushed aside and into a discharge-spout S, by means of which it is delivered to a convenient receptacle for receiving and holding the same. As soon as the tablet is pushed away the handle is lowered slightly, allowing the lower compressor to drop to the limit of its downward movement, when the loose powder in the hopper fills the die, and the hopper is swung back out of the way, scraping off the powder just flush with the top of the die and leaving therein exactly the quantity previously measured out. This operation is repeated until the entire prescription is made up, and in doing the same the operator need not remove his hands from the handle and hopper, respectively, but may operate both continuously and rapidly as long as necessary. There is no necessity for timing the movements of the two hands, the only requisite being that such movements be made in the proper order. Neither is there any necessity for accuracy of movement, as the position of the various parts at the important moments are determined by the stops, making the time of one movement entirely independent of another and making it impossible to interfere with the proper operation of the machine by any variation in the speed of the movements one in respect to the other.

In making up large quantities of tablets it becomes necessary to employ a larger supply vessel, and I have therefore provided an auxiliary funnel R, (see Fig. 3,) formed with a reduced portion *r*, adapted to lie in the hopper P, and having an opening which may be brought to register with the opening in the die when said hopper is swung to that position. The funnel R is preferably provided with a set-screw *r'*, by which it may be securely fastened to the hopper P. It has been found that in using damp powder it clogs the outlet in the funnel, and to overcome this I have provided an agitator *r*³. This agitator extends through the funnel and is formed with a hook upon one end, said end being near the outlet in the funnel, and is adapted to agitate the powder therein, so that it will readily flow into the die. The agitator may be operated by simply pressing the same with the finger, a spring *r*² being provided for returning the same to place.

I claim as new and desire to secure by Letters Patent—

1. In a machine for forming powder into tablets, the combination with a suitable framework of a die supported therein, an upper compressor arranged above the die and adapted to enter the same, a lower compressor arranged within the die and adapted to reciprocate therein, an adjustable stop arranged

in the path of the lower compressor and adapted to fix the lowest position of the same, an operating-handle supported upon the machine, connections between said handle and the upper compressor adapted to reciprocate the latter, connecting devices between the handle and the lower compressor adapted to enter into engagement in the proper direction to raise said lower compressor, and an adjustable stop arranged to engage said devices and limit their movement in such direction; substantially as described.

2. The combination with the frame of a tablet-machine provided with a die, an operating-handle, an upper compressor guided in the frame and adapted to enter the die and be reciprocated by said handle, of a lower compressor adapted to reciprocate within the die, provided with a spring tending to draw it downward in the same and an adjustable stop adapted to limit such downward movement, connecting devices between the handle and the lower compressor adapted to engage and raise said lower compressor and having a free movement with respect thereto in the opposite direction, and a stop adapted to limit the upward movement of the lower compressor; substantially as described.

3. In a tablet-machine, having a suitably-supported die, and suitably-guided upper and lower compressors adapted to coact with said die and form tablets, a handle pivoted to the upper compressor, a link, pivoted to both the handle and a suitable support, a connecting device pivoted to the handle on the opposite side of the link-pivot from the upper compressor-pivot, and a lever pivoted between its ends upon a suitable support, engaging the lower compressor upon one side of said support and the connecting device upon the other side of the support, whereby the upward movement of the handle may raise both compressors; substantially as described.

4. The combination with the frame of a tablet-machine having a suitable die and upper and lower compressors adapted to be reciprocated with respect to said die and to form tablets therein, of an oscillating lever pivoted between its ends to the frame, and engaging the lower compressor at one end, a handle pivoted to the frame by means of a link, and also pivoted to the upper compressor at one side of said link, and a pitman, I, provided with a slot, a pin, *h*³, upon the opposite end of the oscillating lever, and working in said slot, and a pivot in the upper end of the connecting-rod, I, and in the handle, upon the opposite side of the link; substantially as described.

5. The combination in a tablet-machine and with a frame having a die, and a suitably-operated upper compressor, of a lower compressor adapted to reciprocate in the die, and having a limited downward movement, the oscillating lever, H, pivoted to the frame between its ends and engaging the lower compressor at its forward end, the reciprocated

pitman, I, engaging the rear end of the oscillating lever, and the adjustable stop, K, adapted to limit the downward movement of said pitman; substantially as described.

- 5 6. A tablet-machine having a suitable frame, a die thereon, a vertically-reciprocated upper compressor guided in the frame and entering the die from above, a lower compressor having a plunger within the lower
10 portion of the die and means for raising said plunger to eject the tablet, said lower compressor having a collar to receive and hold the bottom of the plunger, a rod held at its upper end in the collar and guided by the
15 frame at its lower end, a spring upon the rod tending to draw it downward and an adjust-

able stop to limit its downward movement; substantially as described.

7. In a tablet-machine an oscillating hopper, P, having an opening, p^3 , and a hood, p^4 , 20 an auxiliary funnel, R, having a reduced portion, r , the agitator, r^3 , spring, r^2 , and the set-screw, r' ; substantially as described.

In witness whereof I have hereunto set my hand, at Chicago, in the county of Cook and 25 State of Illinois, this 1st day of March, A. D. 1897.

WILLIAM FRECK.

Witnesses:

CHAS. O. SHERVEY,
R. O. BAILEY.