

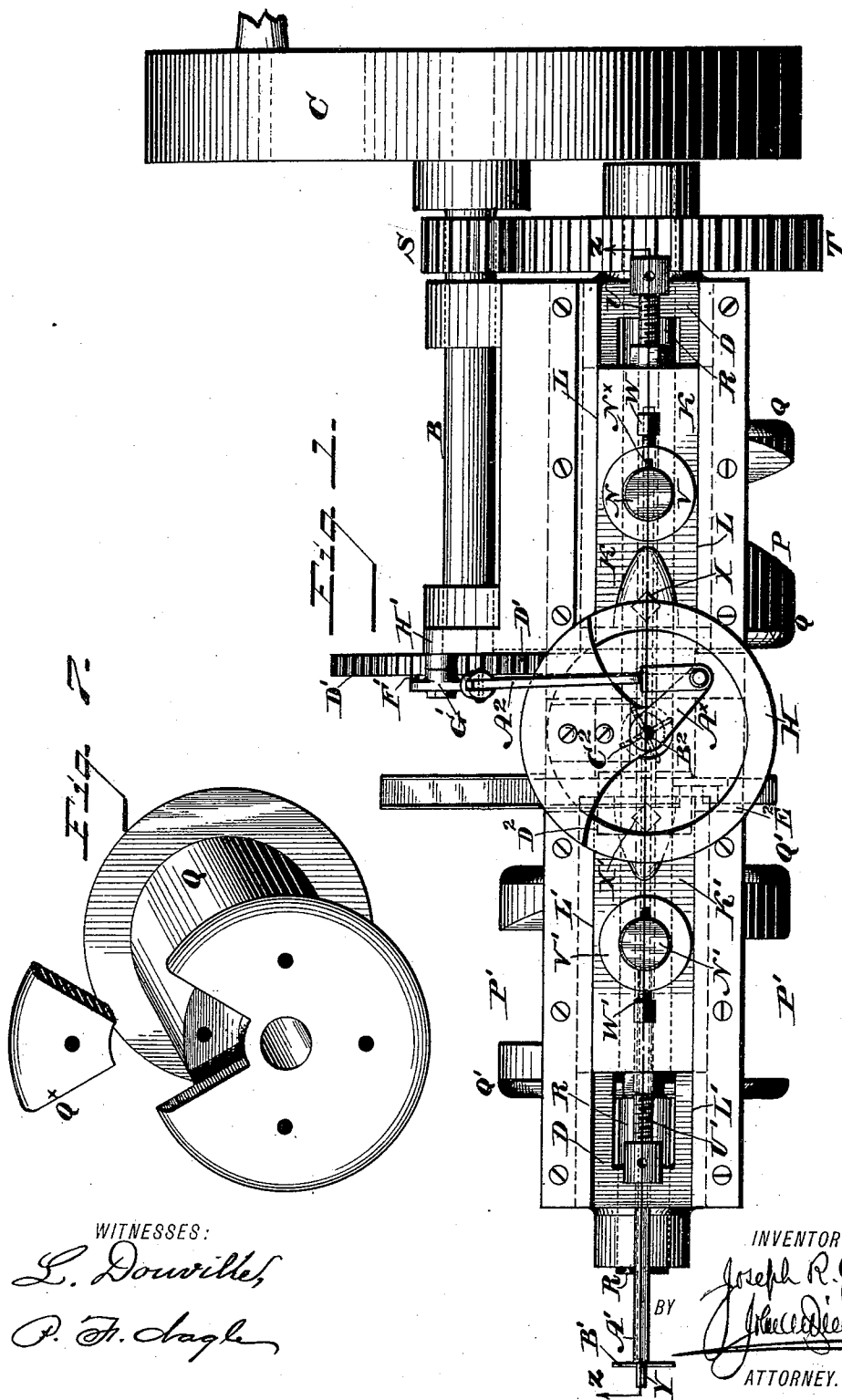
(No Model.)

4 Sheets—Sheet 1.

J. R. WITZEL.
PILL MACHINE.

No. 470,028.

Patented Mar. 1, 1892.



WITNESSES:

L. Douville,

P. F. Dagley

INVENTOR

Joseph R. Witzel

John C. Dickerson

ATTORNEY.

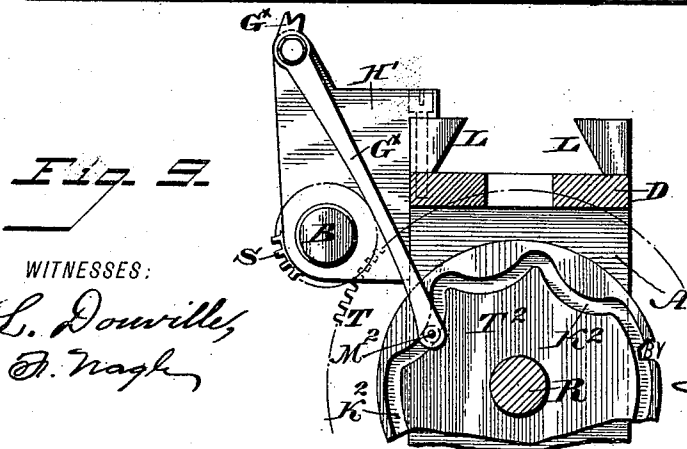
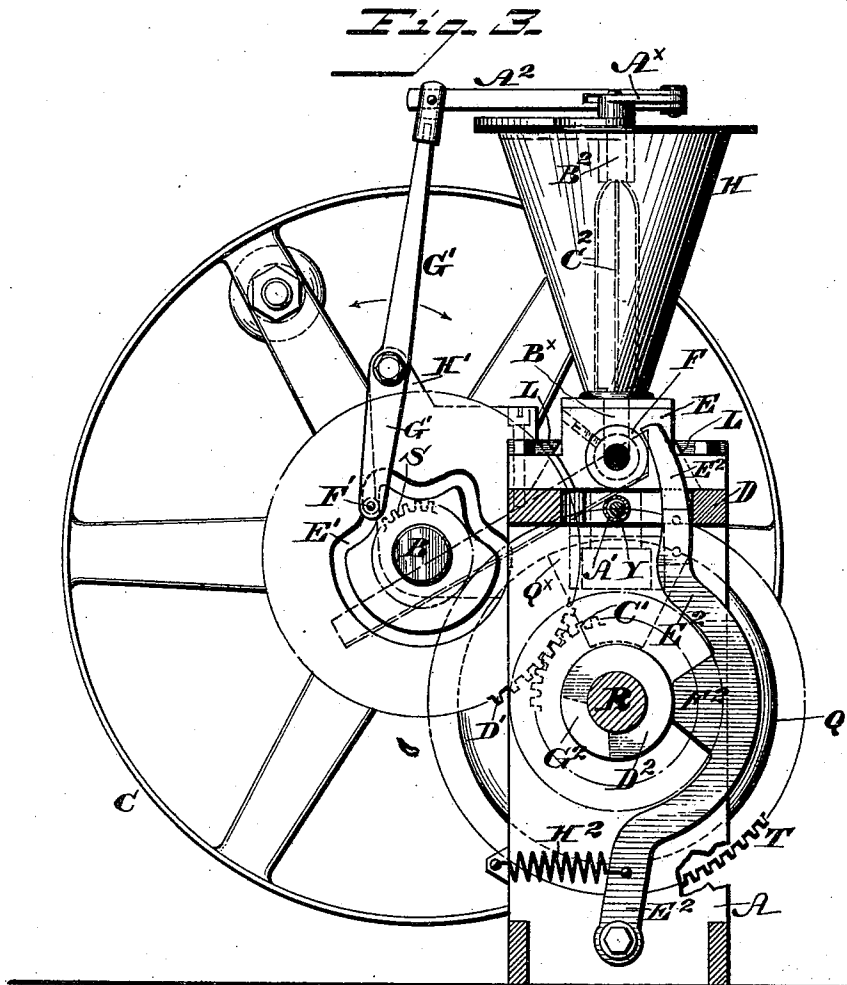
(No Model.)

4 Sheets—Sheet 3.

J. R. WITZEL.
PILL MACHINE.

No. 470,028.

Patented Mar. 1, 1892.



WITNESSES:

L. Douville,
P. D. Nagle

INVENTOR

Joseph R. Witzel
John J. Witzel

ATTORNEY.

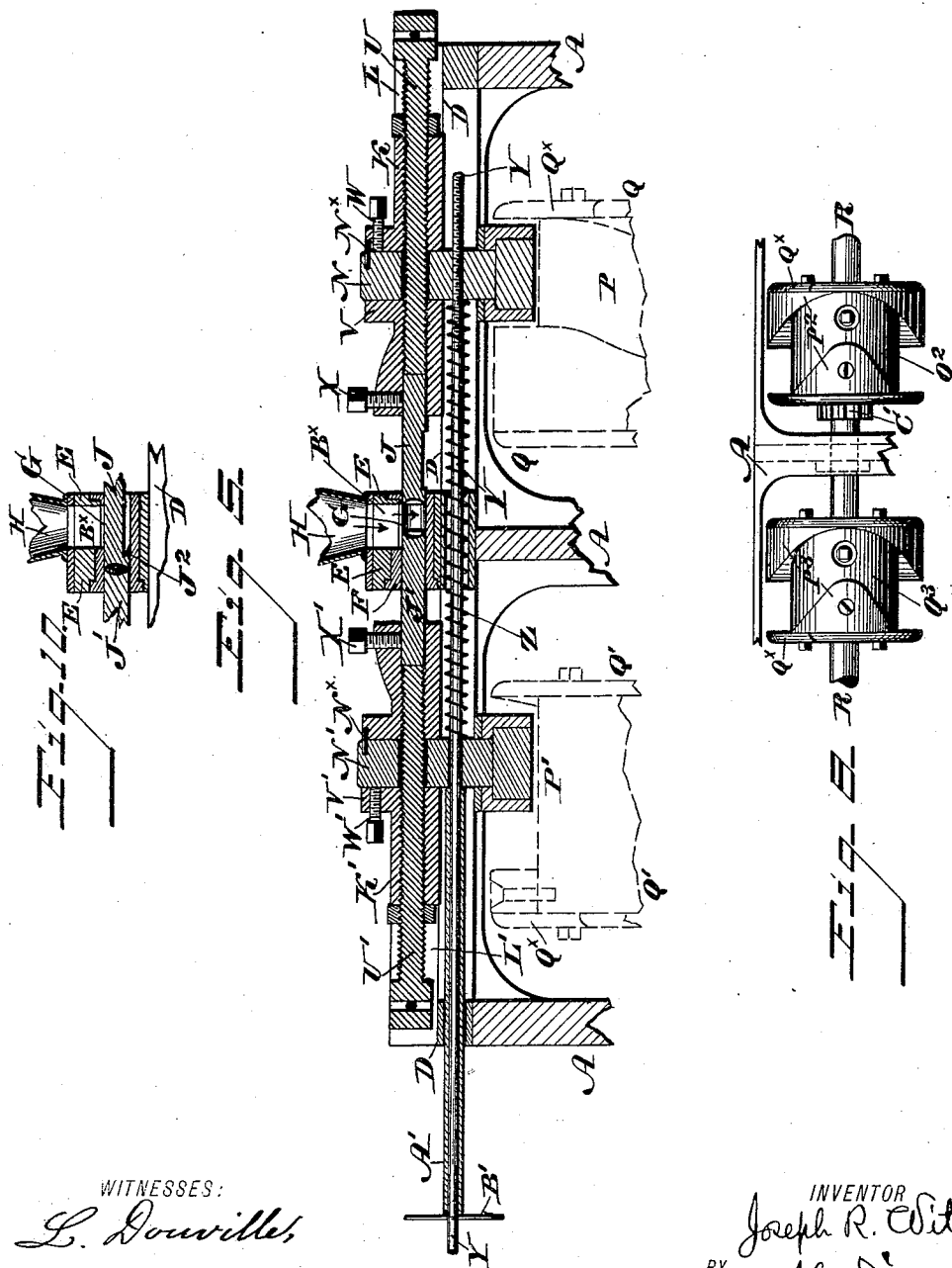
(No Model.)

4 Sheets—Sheet 4.

J. R. WITZEL.
PILL MACHINE.

No. 470,028.

Patented Mar. 1, 1892.



WITNESSES:
L. Douville,
P. B. Chagler

INVENTOR
Joseph R. Witzel
BY *John A. Frederick*
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOSEPH R. WITZEL, OF PHILADELPHIA, PENNSYLVANIA.

PILL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 470,028, dated March 1, 1892.

Application filed May 11, 1891. Serial No. 392,324. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH R. WITZEL, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Pill-Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in pill-machines; and it consists, first, of a pill-machine provided with a stationary feeding device constructed of parts as hereinafter set forth and claimed.

It further consists of mechanism for adjusting the opening in the mold between the dies, so as to regulate the size of the pill.

It further consists of mechanism for operating the said dies.

It further consists of the combination and arrangement of parts, as hereinafter described.

Figure 1 represents a plan view of a pill-machine embodying my invention. Fig. 2 represents a side view partly broken away of the same device. Fig. 3 represents a vertical section on line *xx*, Fig. 2. Fig. 4 represents a vertical section on line *yy*, Fig. 2. Fig. 5 represents a vertical longitudinal section on line *zz*, Fig. 1. Fig. 6 represents perspective views of the mold and dies. Fig. 7 represents a perspective view of a detail portion of the device. Fig. 8 represents a side view in elevation of the modifications for operating cams for the dies on a reduced scale. Fig. 9 represents a vertical section of a modification of the agitating portion of the mechanism. Fig. 10 represents a vertical sectional view of a portion of the device, the parts being in different positions from that shown in Fig. 5.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the frame of the machine, having suitably mounted therein the driving-shaft B, which receives motion from a wheel or pulley C thereon. Secured to the bed D of the said frame is a sectional holder E for a mold F, in which the pill or tablet is formed. The said mold consists of a body portion with heads formed of suitable material, and is held firmly between the sections of said holder and provided with

a recess G, adapted to receive the material or composition forming the pill through a throat B^x in said holder from a hopper H. The said recess is open at its ends to receive the dies J and J', which move therein, and the walls of the opening of the recess which receives the composition or pill material is converging at one end for a purpose hereinafter explained.

For operating the dies so as to compress the pill material between the same, and also to remove the pill from the mold, the following mechanism is employed: The die J, which may be of any suitable form, is connected with a sliding block K, movable in the ways L on the bed D of the machine and provided with a stud or pin N, projecting downward into the cam-groove P of a drum Q. The said drum Q is mounted on a shaft R, having bearings in the frame A and receiving motion from the shaft B by means of the meshing pinion S and the gear-wheel T, mounted on said shafts B and R, respectively. To adjust the position of the die J longitudinally in the said block K, a screw U is employed, said screw passing through an opening in the stud N, which latter is inserted in the said block and has a pin N^x, adapted to rest in a recess in the top of the boss V on the said block, so as to keep the said stud N from turning in the block and bearing against the screw U. A screw W, passing through the boss V and bearing against the stud N, holds the same firmly in place, preventing it from rising in the block K during the operation of the device, and a screw X, passing through an opening in the block K, bears against the die J, holding it in place on the block. The die J' is connected with a sliding block K' movable in ways L' and provided with a stud N', which projects into a cam-groove P' on a drum Q', mounted on the shaft R and rotatable therewith. A screw U' serves to adjust the position of the die J' in said block, and a screw X' serves to hold the said die in place therein. The parts K', L', N', and U' are similar in construction and operation to the parts K, L, N, and U, heretofore described. A screw W' in the boss V' holds the stud N' securely in place. Freely movable in a horizontal opening in the stud N' is a rod Y, having a threaded end inserted in a threaded opening in the stud N. A coil-spring Z encir-

cles said rod, having its ends bearing against the inner walls of the studs, and a sleeve or tube A', supported in a portion of an attachment to one end of the frame A, serves as a
 5 guide for said rod, the said sleeve at its inner end abutting against the stud N', and the rod has at its outer end a cross-pin or stop B', adapted to abut against the outer end of the sleeve. On the shaft R is secured a gear-
 10 wheel C', meshing with a loose gear-wheel D' on the shaft B. The said wheel D' has in its side a cam-groove E', in which projects a pin F' on one end of the lever G'. The said lever is pivoted to a projecting arm H' of the frame
 15 A, and has its other end pivotally attached to an arm A³, pivotally connected with the crank-arm A^x of the vertical rotary shaft B² of the stirrer or mixer C² in the hopper H. In order to move the blocks K K' away from
 20 the mold, so as to change the dies therein without rotating the drums Q Q', one head of each of the latter is formed with a removable section Q^x, said sections forming a portion of one of the walls of the grooves P P' on the
 25 drums, and in which the pins N N' move. By removing the said sections when adjacent to the said pins the blocks K K' can be moved longitudinally away from the mold without rotating the drums. In operating the machine
 30 the sections are secured by pins or other suitable means to the bodies of the drums. On the shaft R is secured a cam D², against which bears a wiper E², adapted to be passed between the die J' and one end of the mold. The said
 35 wiper is pivoted to the frame A, and has a projection F² thereon adapted to enter a recess G² on said cam, and a spring H², secured to the frame and wiper, keeps the latter in contact with said cam.
 40 The cams are so timed and the cam-grooves on the drums are so formed that the movement of the machine is as follows: The dies being in the mold in the position shown in Fig. 5, the pill material enters from the hop-
 45 per through the throat in the holder into the recess in the mold between the ends of the dies and is carried in the mold by the said dies, which are moved, owing to the movement of their connected blocks by the rotating
 50 drums, to one end of the mold, so as to close the entrance from above into the opening between the dies. The die J' is then stopped and the die J advances toward the die J', thereby compressing the material and forming
 55 the pill. The die J' then is withdrawn from the mold, and the die J is first slightly retracted or drawn back from the pill, so as to free it from the same. It is then advanced, forcing the pill from the mold. The wiper E²
 60 then passes between the end of the mold and the die J', removing the pill in case of its sticking to the end of the die. The coil-spring Z on the rod Y, bearing on the studs N N', serves to keep the same in contact with the
 65 proper walls of their respective grooved cams for operating them, and thereby preserve the proper distance apart of the inner ends of the

dies during their movements. The size of the recess or opening between the dies J J' may also be adjusted by turning the pin B', so
 70 that the screw-threaded end of the rod Y in the stud N will force the studs N N', and consequently the blocks K and K', with their dies, closer together, thus controlling the supply of pill material.

In Fig. 8 are shown drums Q² Q³ with cams P² P³, which are adapted to be employed when it is desired to measure the pill material in the mold without compressing it.

By forming the opening at the entrance to
 80 the recess in the mold of converging or narrowed form a forcing out of the material is prevented, as the dies carry the same under the block or holder.

It will be noticed that the feeding portion
 85 of the mechanism—that is, the hopper, mold, and holder—are stationary during the feeding of the pill material into the mold.

In Fig. 9 is shown a modified form of mechanism for operating the mixer. On the side
 90 of a disk T², secured on the shaft R, is formed a groove K², in which projects the pin M² of the lever G^x, which operates the mixer-shaft.

The under side of the die J is formed with a projection or shoulder having a beveled or
 95 inclined edge J² for scraping any material which may become attached to the walls of the mold.

Having thus described my invention, what I claim as new, and desire to secure by Let-
 100 ters Patent, is—

1. A pill-machine having a frame with a stationary hopper therein, a stationary holder, a mold in said holder having a longitudinal passage and an opening leading from the top of
 105 said mold into said longitudinal passage, said opening being a feed-throat for the material from the hopper, dies working in opposite ends of said longitudinal passage, and mechanism, substantially as described, for reciprocating said dies, substantially as described,
 110 said parts being combined as stated.

2. A pill-machine having a frame, a holder, a mold in said holder, a stationary hopper, and dies movable longitudinally in said mold,
 115 said mold having a throat communicating with said hopper, the latter being above said throat, said parts being combined substantially as described.

3. A pill-machine having a holder, a stationary mold in said holder provided with a longitudinal passage-way, and an opening leading from the top of the mold into said longitudinal passage, dies adapted to work in and
 120 out of said passage-way, blocks in which said dies are adjustably held, depending studs connected with said blocks, and rotary drums having cam-grooves on their peripheries in
 125 which said studs project, said parts being combined substantially as described.

4. A frame, a mold, sliding blocks movable in ways on said frame and provided with depending studs, dies connected with said block
 130 and movable in said mold, and a rotary shaft

with grooved cams in which the studs of the said blocks depend, said parts being combined substantially as described.

5 5. A frame, a holder having a throat, a mold in said holder having a recess with an opening communicating with said throat, said opening being of converged or narrowed width at one end thereof, and dies movable in said recess, said parts being combined substantially as described.

10 6. A pill-machine having a frame, a holder, a stationary mold, dies movable longitudinally in opposite ends of said mold, a feed-throat in said mold at an angle to the line of movement of the dies, blocks to which said dies are adjustably connected, and mechanism for imparting reciprocating motion, as described, to said blocks, said parts being combined substantially as described.

20 7. A frame, a holder secured thereon, a mold secured to said holder, sliding blocks movable in ways on said frame and having depending studs, dies secured to said blocks and movable in said molds, a rotary shaft with grooved cams in which the said studs project, and means for preserving the proper distance apart of said dies during their movements, said parts being combined substantially as described.

30 8. A frame, sliding blocks therein having depending studs, a rod passing loosely through one stud and having a threaded end inserted in a threaded opening in the other stud, a coil-spring on said rod between said studs, a sleeve encircling said rod on the opposite side of one of the studs from the said coil-spring, a pin in the rod bearing against the end of the sleeve, and a rotary shaft with drums having cam-grooves therein in which said studs project, said parts being combined substantially as described.

45 9. In a pill-machine, a stationary holder, a mold therein having an opening in its upper side for the reception of the material, dies working longitudinally in opposite ends of said mold and at an angle to the line of feed from the hopper, and a wiper adapted to move

across the discharge end of the mold, said parts being combined substantially as described.

50 10. In a pill-machine, a frame, a mold therein, movable blocks having depending pins, dies adjustable in said blocks and adapted to work in said mold, a driving-shaft, a second shaft meshing with said driving-shaft and having grooved cams in which said pins are inserted, a stationary hopper, a mixer therein, and mechanism for operating said mixer independent of said dies, said parts being combined substantially as described.

60 11. In a pill-machine, a die having on its under side a projection or shoulder with a beveled edge, substantially as and for the purpose set forth.

65 12. A pill-machine having a stationary mold with a longitudinal passage and a feeding-opening in its top wall leading into said passage, dies movable in said passage, and mechanism, consisting of blocks, studs, and cams, substantially as described, for operating said dies so as to remove the material in the mold from below the said feed-opening, compressing the same, removing one of the dies from the mold and disengaging the other from the pill thus formed, and then discharging the pill from the mold, said parts being combined substantially as described.

80 13. In a pill-machine, a stationary hopper having a mixer with a vertical shaft therein, a rotatable shaft carrying a pinion, a shaft with pinion and a disk mounted thereon, said disk having a groove in one of its sides, a frame with projecting arm, a lever pivoted to said arm and having at one end a pivotal arm connected with a crank-arm on the vertical shaft of the mixer, and a pin on said lever working in said groove on the disk, said parts being combined substantially as described.

JOSEPH R. WITZEL.

Witnesses:

JOHN A. WIEDERSHEIM,
A. P. JENNINGS.