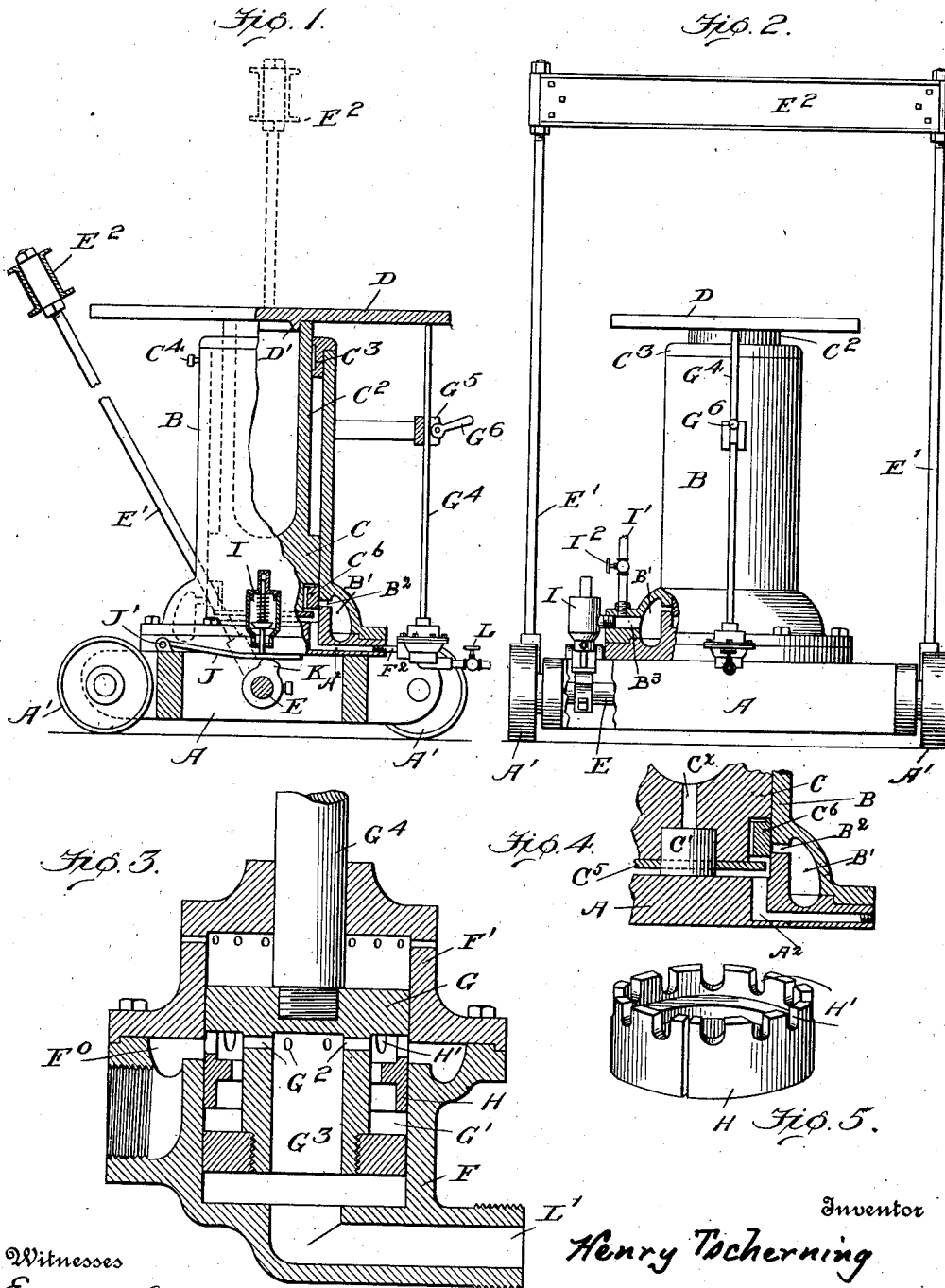


H. TSCHERNING.
 APPARATUS FOR JARRING AND PRESSING GRANULAR MATERIALS.
 APPLICATION FILED MAY 16, 1912.

1,062,808.

Patented May 27, 1913.



Witnesses
 Edwin L. Bradford
 Robert Craig Greene.

Inventor
 Henry Tscherning
 By Wallace W. W. W.
 Attorney

UNITED STATES PATENT OFFICE.

HENRY TSCHERNING, OF FREEPORT, ILLINOIS, ASSIGNOR TO ARCADE MANUFACTURING COMPANY, OF FREEPORT, ILLINOIS, A CORPORATION OF ILLINOIS.

APPARATUS FOR JARRING AND PRESSING GRANULAR MATERIALS.

1,062,808.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed May 16, 1912. Serial No. 697,819.

To all whom it may concern:

Be it known that I, HENRY TSCHERNING, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Apparatus for Jarring and Pressing Granular Materials, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to devices for packing molding sand or similar material by raising the receptacle in which the material is contained, releasing it and suddenly arresting its falling movement to jar the same and thereby pack it effectually, for example about a pattern; and further relates to devices whereby such a machine as has just been indicated may be used to press the material in the receptacle by the application of power.

In the accompanying drawings, Figure 1 shows the main portion of the apparatus in side elevation, with parts in section. Fig. 2 shows the same apparatus seen from the right in Fig. 1. Fig. 3 is an enlarged vertical axial section of a valve located alongside the main cylinder. Fig. 4 is a detail section showing more fully parts seen in Fig. 1. Fig. 5 is a perspective view of a spring ring seen also in Fig. 3.

In these figures, A represents a heavy base, usually supported by wheels A', and B a vertical cylinder rising from the base and provided with an annular exhaust chamber B' in communication, through a passage B² with the lower portion of the interior of the cylinder or piston space. In this cylinder works a piston C having its lower end peripherally diminished and provided with a central steel block C' normally resting upon the bottom of the cylinder and removably seated in a recess in the piston, from which it may be driven when desired, an axial passage C^x being provided for this purpose. The hollow piston stem C² always projects above the cylinder wherein its upper portion is guided by a bearing C³ secured by setscrews C⁴. An annular disk C⁵ is secured to the lower end of the piston to project laterally, and between the projecting portion and the undiminished portion above lies, loosely, a broken spring ring C⁶, materially narrower, vertically, than the space in which it lies. This ring presses outward

against the wall of the cylinder by virtue of its own elasticity and with such force that its weight will not move it from any position in which it may be placed, and normally it covers the passage B². The piston supports a preferably removable table D for the material to be operated upon, and as shown the table is held against lateral movement by a flange D' or the like, engaging the upper end of the piston stem. In the base is mounted a horizontal rock-shaft E bearing on opposite sides of the cylinder upwardly extending arms E' upon the threaded upper ends of which is adjustably fixed a strong crossbar or head E², at such distance from the base that it may swing into and out of position above the plane of a molding flask or the like placed upon the table. Alongside the lower part of the cylinder and usually in front of the same, is a valve chamber formed by upper and lower casing members F, F' bolted together, and in this chamber works a vertically sliding valve G which is cut away centrally to form a deep annular groove G' communicating, by means of passages G² with an internal, downwardly open recess G³ in the valve.

The valve is provided with a stem G⁴ which passes upward through the casing wall and thence through a guide bearing G⁵ provided with a locking cam lever G⁶, to a point where its upper end may meet the table when the valve and the table are both in their lowest positions. The valve casing is provided with an annular passage or chamber F⁰ which is in communication with the valve chamber and also with the space below the piston in the jarring cylinder, the communication in this instance being by means of a pipe F² and a channel A² in the base A. The groove in the valve contains a divided spring ring H of materially less width vertically than the groove and having in its upper margin a series of notches H'. This ring, like the ring C⁶, when acted upon by gravity only remains in any position in which it may be placed.

The jarring or main cylinder B is provided with a discharge passage B³ leading from the chamber B' to a spring closed valve I and also to a pipe I' controlled by a hand valve I². The stem of the valve at I projects into the path of a swinging lever J pivoted to the base at J', and this lever lies in the path of a cam K upon the rock-shaft E.

The parts are so arranged that when the head E^2 is swung from position above the table, as shown in Fig. 1, the cam lifts the lever J and the valve I and holds the discharge passage open, while with the head above the table, as indicated in dotted lines, the cam releases the lever and the valve remains closed.

In operation, the material to be packed being upon the table, the head E being at one side, and the valve stem G^4 being freed by the cam lever, compressed fluid, such as air or steam, is admitted through the valve L and passage L' to the space below the valve G whence it passes through the passages G' , notches H' , chamber F^0 , pipe F^2 , and channel A^2 to the space below the jarring piston C , which it quickly raises until the ring C^0 uncovers the passage B^2 . At the same time, the valve G is also raised, and as it rises the lower wall of the groove engages the ring H and carries it upward until the notches are out of registry with the passage F^0 and the supply of operating fluid is thus cut off from the jarring piston, and the ring C^0 being in raised position and the valve I being open, the jarring piston falls freely until the movement is abruptly arrested by the impact of the block C' upon the bottom of the cylinder. But the piston in descending carries down the ring C^0 , closing the exhaust at this point, and the descending table carries down the valve stem G^4 and valve G , and then the ring H , the movement of the latter bringing the notches H' again into registry with the chamber F^0 , thus readmitting operating fluid to repeat the entire series of operations. This is repeated very rapidly so long as the valve L is left open.

Obviously, the valve L and the conduit controlled thereby constitute a manually controlled means for admitting compressed fluid to the inlet passage in the cylinder, the valve G and its appurtenances serve as a means for automatically interrupting at short intervals the flow of fluid admitted through the valve L , and the cam G^0 is a means for at will holding the interrupting means out of action.

When it is desired to compress material upon the table, the head E^2 is swung to the position shown in dotted lines above the table and flask or material thereon, and this movement of the head carries the cam K out of position and thus allows the spring valve I to close. The valve stem G^4 is locked by the cam lever so that the valve G cannot rise, and the valve L being then opened,

operating fluid passes beneath the main piston forcing it upward and compressing material thereon, *e. g.*, sand in a molding flask, between the table and the head above. When it is desired to discontinue such pressing, the hand valve I^2 is opened, and if desired the valve L is closed, allowing the main piston to descend.

Obviously the hand valves may be of any desired type.

What I claim is:

1. In apparatus of the class described, the combination with a cylinder having inlet and discharge passages below, of a piston working in the cylinder, a spring-closed valve and a second valve each controlling the discharge opening when the companion valve is closed, means for admitting compressed fluid below the piston constantly or intermittently as desired, a manually operated member arranged to be swung into or out of a normal position, and means whereby the spring-closed valve is held open only while said member is out of said position.

2. In apparatus of the class described, the combination with a vertical cylinder and its piston, of a spring-closed valve in the discharge passage leading from the cylinder, a manually operated member arranged to swing into and out of a normal position, a cam operated by the movement of said member and adapted to hold said valve open only while the member is out of said position, a second, manually operated valve controlling said passage when the first valve is closed, and means for admitting compressed fluid to the space below the piston intermittently or constantly as desired.

3. In apparatus of the class described, the combination with a vertical cylinder provided below with inlet and discharge passages, of a piston working in the cylinder above said passages, manually controlled means for admitting compressed fluid to the inlet passage, means for holding the discharge passage closed, and means for automatically interrupting at short intervals the flow of fluid admitted by said manually controlled means, and means for at will holding said interrupting means out of action.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY TSCHERNING.

Witnesses:

L. A. MUNN,
KARL F. LANDGRAF.