No. 748,340. PATENTED DEC. 29, 1903.

O. BERGSTROM & G. BASS.

PRESS FOR MOLDING AND COMPRESSING VARIOUS ARTICLES.

APPLICATION FILED MAY 13, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2.

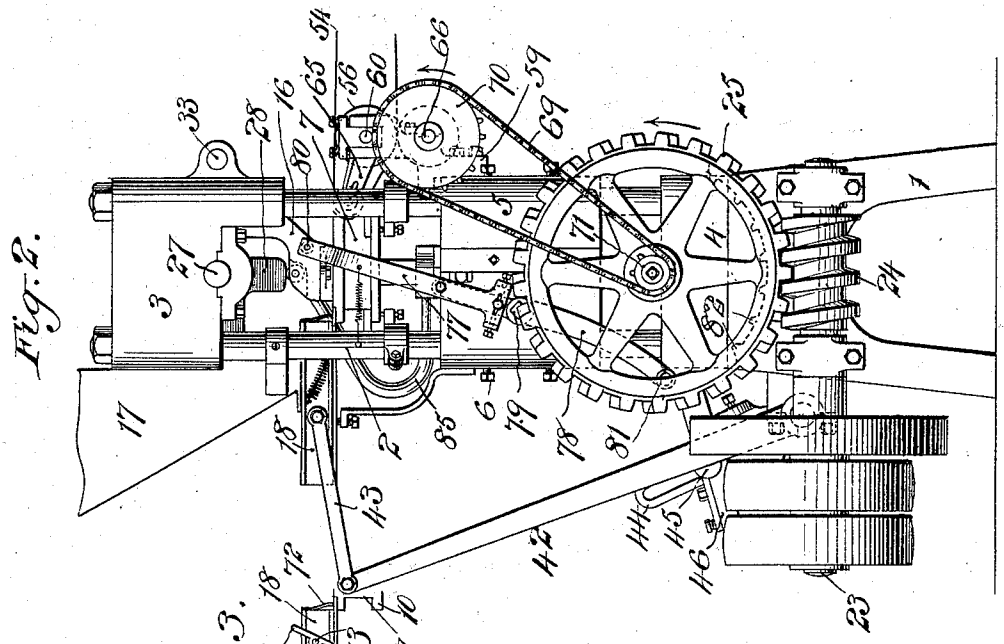

Fig. 3.

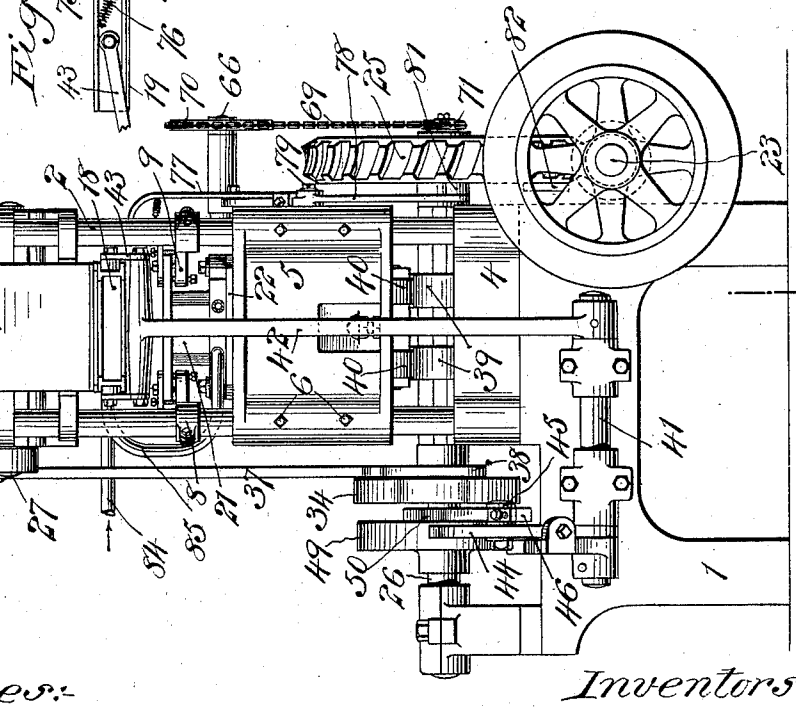

Fig. 1.

Witnesses:-
George Barry Jr.
Henry Thieme

Inventors:-
Oscar Bergstrom and
George Bass
by attorneys
Brown & Sumner

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 7.

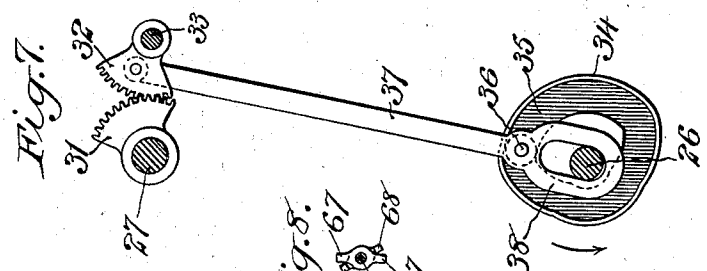


Fig. 8.

Fig. 5.

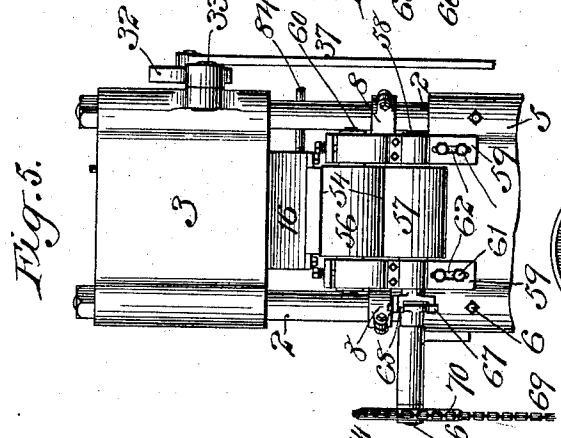


Fig. 6.

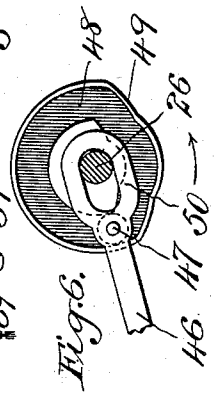


Fig. 9.

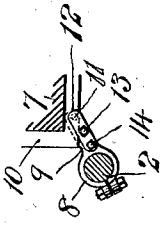
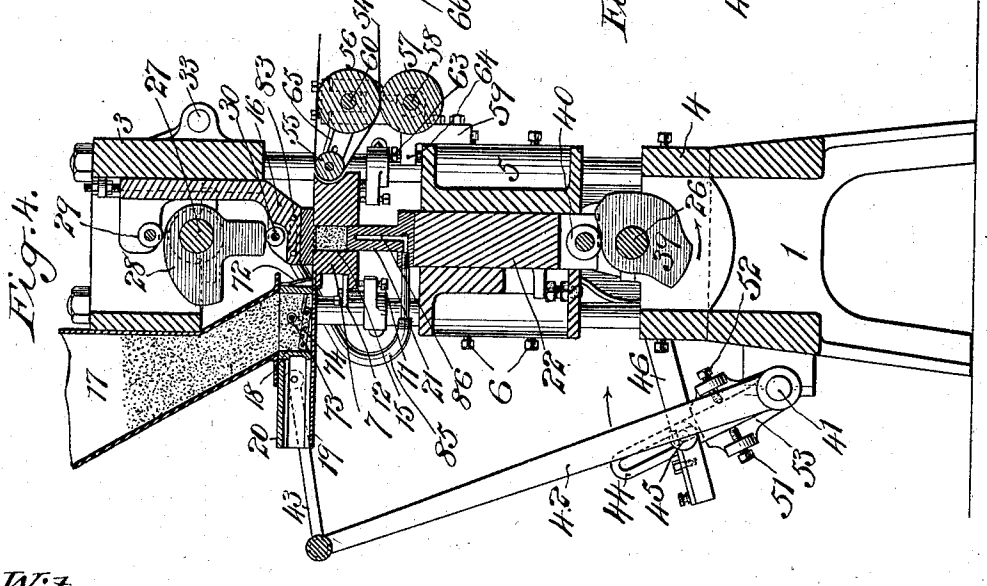


Fig. 4.



Witnesses:
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Henry Thieme

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No. 748,340. Patented December 29, 1903.

UNITED STATES PATENT OFFICE.

OSCAR BERGSTROM AND GEORGE BASS, OF NEW YORK, N. Y.

PRESS FOR MOLDING AND COMPRESSING VARIOUS ARTICLES.

SPECIFICATION forming part of Letters Patent No. 748,340, dated December 29, 1903.

Application filed May 13, 1903. Serial No. 156,903. (No model.)

To all whom it may concern:

Be it known that we, OSCAR BERGSTROM, a subject of the King of Sweden and Norway, (but having made the oath required by law declaring my intention of becoming a citizen of the United States,) and GEORGE BASS, a citizen of the United States, both residents of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Presses for Molding and Compressing Various Articles, of which the following is a specification.

Our invention relates to an improvement in presses for molding and compressing various articles, the object being to provide certain improvements in the construction, form, and arrangement of the several parts of the press patented by us on the 1st day of January, 1901, No. 665,163, whereby the press is made more simple and positive in its action and the product thereof improved. This press is adapted for molding and compressing various articles, such as are produced from material in the condition of powder—for example, tiles.

The press embodying our invention comprises a die corresponding with the perimetrical outline of the article to be produced for the reception of the material of which the article is to be composed, a platen adapted to said die against which the material is compressed within the die, and a plunger operating in the die for the compression of the material therein and the removal of the article from the die.

A practical embodiment of our invention is represented in the accompanying drawings, in which—

Figure 1 represents a front elevation of the press. Fig. 2 represents a side elevation of the same. Fig. 3 is a detail side view of the feed-box. Fig. 4 is a vertical central section from front to rear through the press in the plane of the line A A of Fig. 1. Fig. 5 is a rear elevation of the upper portion of the press. Fig. 6 is a detail view of the cam and the inner end of the bar which controls the feed-box operating-lever. Fig. 7 is a detail view of the cam and parts which operate the platen. Fig. 8 is a detail view of the removable connection between the apron-driving roll and the shaft for driving the same, and Fig. 9 is a detail plan view of the means for adjusting and removing the die.

The base of the press is denoted by 1, and it supports uprights 2. A platen 3 is secured to the upper ends of these uprights, and a supplemental base 4 is located at the lower ends of the uprights. A plunger-guide 5 is adjustably secured on the uprights 2 by suitable fastening devices 6.

The open die 7 is removably and adjustably supported by the uprights 2 as follows: Each upright 2 has adjustably clamped thereon a collar 8. An arm 9 projects from this collar beneath the flange 10 of the die. The flange 10 rests upon a set-screw 11, passing through the arm 9 of the collar 8. A plate 12 overlaps the flange 10 of the die and is secured to the arm 9 by a screw 13. A screw 14, passing through the plate 12 and pressing against the top of the arm 9, serves to clamp the flange 10 between the forward end of the plate and the screw 11. When the screw 14 is released, the plate may be swung on the screw 13 as a pivot out of its engagement with the flange 10 for permitting the removal of the die.

The vertical aperture 15 through the die is made in the shape which it is intended the completed article which is to be pressed therein will assume.

A platen 16 is guided in its vertical movements in the platen-guide 3 toward and away from the mouth of the die 7.

A hopper 17 for receiving the material in powdered form from which the articles are to be made is carried by the platen-guide 3. A feed-box 18 is arranged to be moved from its position beneath the discharge end of the hopper 17 to a position over the mouth of the die 7. This feed-box slides upon a plate 19 projecting from the top of the die 7.

The feed-box 18 is provided with a plate 20, which is fitted to close the discharge end of the hopper 17 when the box has been moved over to its position in communication with the die.

The plunger is denoted by 21, and it is secured to its block 22, which block is fitted to slide vertically in the plunger-guide 5.

The main drive-shaft of the press is denoted by 23 and may be driven from any source of power. (Not shown herein.) This drive-shaft

23 is provided with a worm 24, which meshes with a gear 25, fixed to the cam-shaft 26. This cam-shaft 26 is mounted in suitable bearings in the base 1 and supplemental base 4.

The perfectly-reciprocating platen 16 is operated by the cam-shaft 26 as follows: A rock-shaft 27 is mounted in the platen-guide 3 and is provided with an irregular cam 28, arranged to engage rollers 29 30, carried by the platen above and below the rock-shaft. A toothed segment 31 is fixed to the rock-shaft 27 and meshes with a toothed segment 32, mounted on a stud-axle 33 on the exterior of the platen-guide 3. A face-cam 34 is fixed to the cam-shaft 26 and is provided with an irregular groove 35 therein, within which a stud or roller 36 travels. This stud or roller 36 is carried by a bar 37, connected to the toothed segment 32 and guided in its movements by means of a loop portion 38, embracing the cam-shaft 26. When the platen 16 has been brought down onto the face of the die 7 to cover the mouth of the same, one portion of the cam 28 of the rock-shaft 27 engages the lower roller 30 of the platen and locks the platen against an upward movement.

The plunger 21 is operated by means of two cams 39, which engage studs or rollers 40, carried by the block 22. The faces of these cams 39 are so formed that as the cam-shaft is rotated the plunger 21 will be first forced upwardly within the die to compress the material therein, will then be withdrawn slightly to permit the escape of air from the material, and will then be again advanced to a point slightly higher to complete the compression of the material to form the article. This movement is accomplished while the platen is held down against the mouth of the die. The further movement of the cam-shaft will cause the cam 28 to raise the platen 16 and cause the cams 39 to raise the plunger 21 a sufficient distance to eject the article from the die.

The means which we have shown for operating the feed-box is constructed as follows: A rock-shaft 41 is mounted in suitable bearings in the base 1 of the press. This rock-shaft has fixed thereto an arm 42, having a link connection 43 with the feed-box, and an arm 44, having an adjustable connection 45 with the cam-bar 46. This cam-bar 46 is provided with a stud or roller 47, which is located in a face-groove 48 in the cam 49, fixed to the cam-shaft 26. The inner end of this bar 46 is supported by forming a loop 50, embracing the said shaft 26. The length of stroke, and thereby the movement of the feed-box, may be adjusted by the device 45. The position of the feed-box may also be adjusted by means of the set-screws 51 52, carried by a plate 53, mounted on the rock-shaft 41, the said screws 51 52 engaging the front and rear edges of the arm 44. The movement of the feed-box is so timed that it will be moved into position around the mouth of the die for permitting the material within the feed-box to drop into the die when the platen 16 is raised and the plunger 21 is lowered. The feed-box is immediately withdrawn after it has deposited its contents into the die, and the platen 16 is brought down into engagement with the mouth of the die, as hereinbefore set forth.

An endless apron 54 is removably and adjustably secured in proximity to the die 7, so as to receive the articles thereon after they have been formed within the die. The end of the apron 54 adjacent to the die passes around a small roller 55 adjacent to the face of the die and from thence between a large roller 56 and a drive-roller 57. The axle 58 of the drive-roller 57 is mounted in fixed bearings in an adjustable bracket 59, and the axle 60 of the roller 56 is mounted in yielding bearings in the said bracket. This bracket 59 is adjustably secured to the plunger-guide 5 by means of bolts 61, passing through elongated slots 62 in the bracket, and a screw-bolt 63, passing through an arm 64 of the bracket into engagement with the top of the guide 5. The small roller 55 of the endless apron is mounted in the end of an arm 65, projecting from the bracket 59. The endless apron may thus be adjusted with respect to the die after the die has been adjusted with respect to the platen and plunger.

When it is desired to remove the die, as hereinbefore set forth, the apron may first be removed by unscrewing the bolts 61, thus permitting the die to be removed through the back of the press.

The apron-driving roller 57 is driven as follows: A short shaft 66 is mounted in suitable bearings on the plunger-guide 5 and is removably connected to the axle 58 of the roller 57 as follows: The shaft 66 is provided with two outwardly-extended arms 67, which engage two L-shaped arms 68, which project from the axle 58. The apron 54 and its parts may thus be adjusted with respect to the die and may also be removed without changing the position of the driving-shaft 66. This shaft 66 is driven by a sprocket-chain 69, which engages a sprocket-wheel 70 on the shaft 66 and a sprocket-wheel 71 on the cam-shaft 26.

The feed-box 18 is provided with a spring-plate 72, which serves to yieldingly engage the article which has been compressed within the die and ejected therefrom and slide the article along the die as the feed-box is moved forwardly until the article is engaged by the apron 54, which serves to remove the article to any desired point. This yielding plate 72 prevents the die-block from injuring the article as the article is being fed to the apron.

We provide means for agitating the contents of the feed-box when it has reached a position over the die to insure the dropping of the contents into the die as follows: A

rock-bar 73 passes through the feed-box and is provided within the feed-box with an agitator 74 of suitable construction, preferably a skeleton frame, loosely carried by the said bar 73. Exterior to the feed-box the bar 73 is provided with a spring-actuated arm 75, the spring 76 serving to hold the arm at the limit of its movement in one direction. A two-armed lever 77 78 is pivoted at 79 to the plunger-guide 5, and the upper arm 77 of this lever is provided with a stud or projection 80, arranged to engage the arm 75 as the feed-box is brought into position over the die. The lower arm 78 is provided with a stud or roller 81, which is fitted to be brought into engagement with a series of inwardly-projecting lugs 82 on the gear 25, so that as the gear revolves a series of vibrating movements will be imparted to the lever 77 78, and thereby to the agitator 74.

We provide for heating the platen and plunger as follows: The platen is provided with ducts 83 for the reception of some heating medium—such, for instance, as steam. In the present instance we have shown a steam-pipe 84 leading to these ducts and a flexible tube 85 leading from these ducts to a heating duct or chamber 86 in the plunger 21.

By heating the platen and plunger we are enabled to keep the powdered material from which the articles are being formed from sticking to these parts, and we also do away with the necessity of lubricating the plunger.

What we claim is—

1. In a press for molding and compressing, an open die, a support therefor, a platen for closing the mouth of the die, a plunger operating within the die, a feed-box movable across the die, a cam-shaft for controlling the movements of the platen, plunger and feed-box, an agitator within the feed-box and a rocking lever controlled by the cam-shaft for operating the agitator when the feed-box is in position over the die.

2. In a press for molding and compressing, an open die, a support therefor, a movable platen for closing the mouth of the die, a plunger operating through the bottom of the die, a feed-box movable across the die between it and the platen and a spring tile-ejector carried by the forward end of the feed-box.

3. In a press for molding and compressing, an open die, a support therefor, an endless apron, a drive-roller therefor, a bracket for removably supporting the apron in proximity to the die and a drive-shaft removably engaged with the apron-drive roller.

4. In a press for molding and compressing, the combination with an open die and a support therefor, a platen movable toward and away from the die, a plunger operating within the die, a feed-box, means for moving the feed-box, across the die between it and the platen, means for determining the amount of movement of the feed-box and separate means for determining the position of the feed-box.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of two witnesses, this 27th day of April, 1903.

OSCAR BERGSTROM.
GEORGE BASS.

Witnesses:
FREDK. HAYNES,
HENRY THIEME.