W. W. MYERS & J. R. ROYER.

TILE MACHINE.

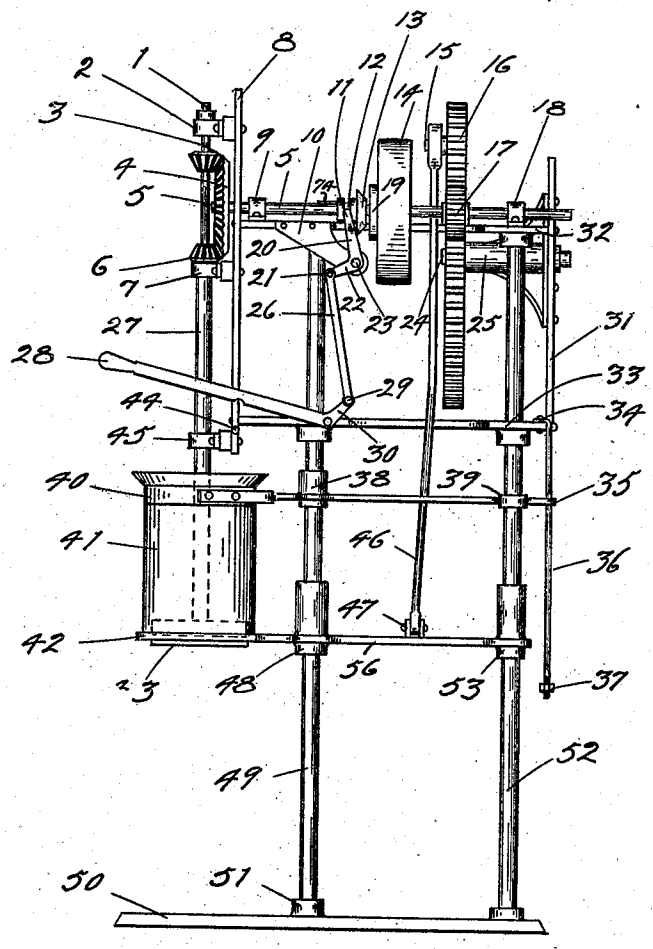
APPLICATION FILED SEPT. 26, 1908.

921,142.

Patented May 11, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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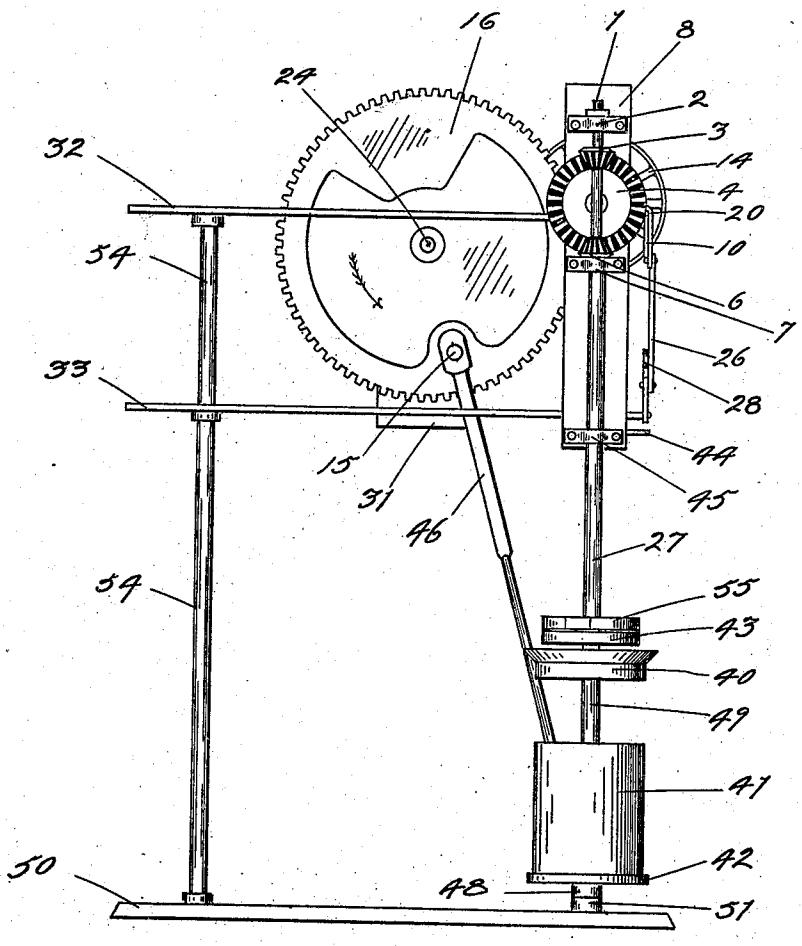
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

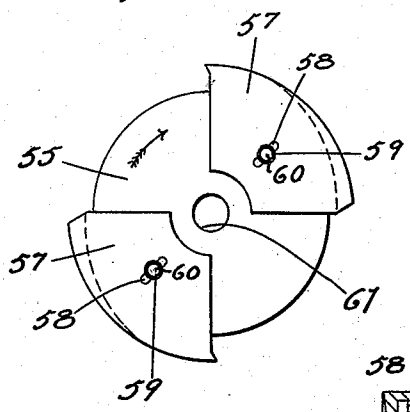


Fig. 4.

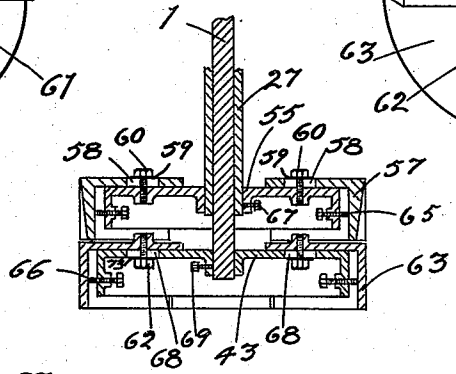


Fig. 3.

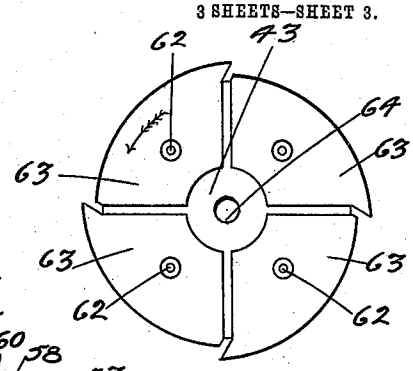


Fig. 6.

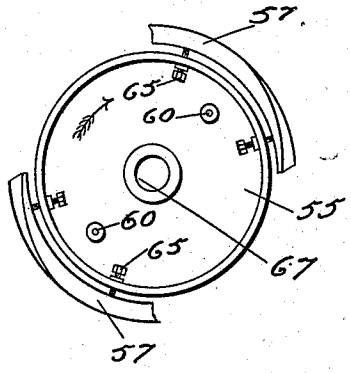


Fig. 5.

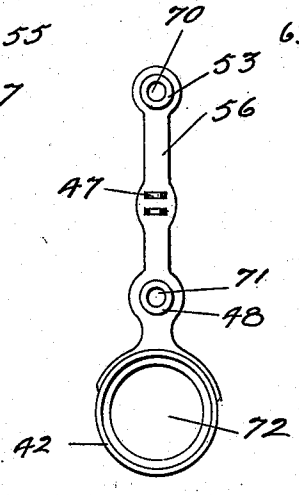


Fig. 8.

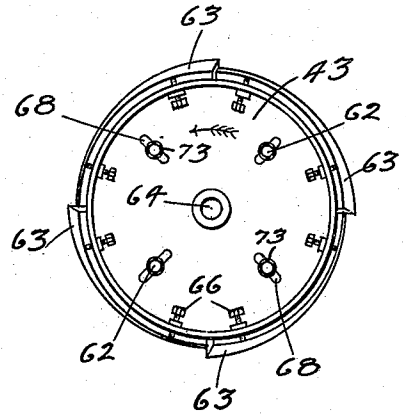


Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM W. MYERS AND JESSE R. ROYER, OF JANESVILLE, IOWA.

TILE-MACHINE.

No. 921,142. Specification of Letters Patent. Patented May 11, 1909.

Application filed September 26, 1908. Serial No. 454,873.

To all whom it may concern:

Be it known that we, WILLIAM W. MYERS and JESSE R. ROYER, citizens of the United States of America, and residents of Janesville, Bremer county, Iowa, have invented certain new and useful Improvements in Tile-Machines, of which the following is a specification.

Our invention relates to improvements in tile machines, and the object of our improvements is to provide a forming-device for the interior of the tile, so constructed and adapted as to be adjustable for forming tiles of different thicknesses, or to compensate for wear of the exterior contact-surfaces, and otherwise to improve the construction and arrangement of the machine to make it practically effective. This object we have accomplished by the mechanism which is hereinafter fully described and claimed, and which is illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of our said improved tile-machine. Fig. 2 is a front elevation thereof. Fig. 3 is a central axial vertical section, enlarged, of the forming-device. Fig. 4 is an enlarged upper plan view of the upper former-head. Fig. 5 is an enlarged lower plan view of the part depicted in Fig. 4. Fig. 6 is an enlarged upper plan view of the lower former-head. Fig. 7 is an enlarged lower plan view of the part depicted in Fig. 6. Fig. 8 is an upper plan view of the vertically-movable table for the outer mold-casing.

Similar numbers refer to similar parts throughout the several views.

Our machine is intended to form hollow cylindrical drain-tiles from a mixture of cement and sand, commonly denominated "concrete", and this invention is an improvement upon the tile-machine for which we have a pending application for patent in the United States Patent Office, filed May 11th, 1908, under Serial Number 432,034.

The essential and important feature of our improvement is in the form and adjustable construction of the former-heads used to form the interior of the tile in coöperation with the outer mold-casing. Said former-heads consist of two superposed cylindrical cores, an upper core 55 having an integral axial sleeve adapted to be detachably secured upon a hollow cylindrical shaft 27 by means of a set-screw 67, and a lower core 43 having an integral axial sleeve adapted to be detachably secured to the lower end of a solid shaft 1 by means of a set-screw 69. The two cores are relatively spaced but a narrow distance apart, while the solid shaft 1 is contained within the hollow shaft 27, the two shafts being adapted to be rotated in opposite directions by means of the mechanism to be hereinafter described. Each of said cores is provided with a plurality of forming-plates which are made adjustable in a direction leading outward from the axis of the core radially, as well as being adjustable eccentrically. The upper core 55 has but two of these forming-plates 57, located oppositely and spaced apart widely to provide a channel or chute between them for the tile-material to move therein and be permitted to pass downward between the forming-heads and the interior surface of the outer mold-casing 41.

Each forming-plate 57 has a radial slot 58 to permit the securing therethrough of a bolt 60 adjustably, the bolt being screwed into a seat in the upper horizontal plate of the core 55 with a washer 59 seated between the head of the bolt and the top of the plate 57. When the bolt 60 is turned to loosen its clutch upon said plate, the latter may be moved radially outward, or may be shifted on the bolt eccentrically as desired, or adjusted in both ways. The outer portion of each plate 57 has a depending flange which is spaced away from the outer surface of the cylindrical part of the core 55 by means of adjusting screws 65. The forward portion of the outer side of each of said flanges is beveled off downwardly and inwardly, which permits the moving flange to grasp and compress the tile-material and form it against the interior surface of said outer mold-casing.

The lower core 43 is provided with a plurality of forming-plates 63, which however, are somewhat dissimilar from the plates 57, in this, that the depending flange of each plate is not beveled, but is increased in thickness gradually beginning with its forward end. Each flange is at its forward end bent inward toward the core 43. Each plate 63 is orificed to receive a bolt or machine-screw 62 extending through a slot 68 in the underlying core-top, the washer 73 being interposed between the bolt-head and the under face of said core-plate. The plates 63 are adjusted by turning them on said bolts, or

by moving them in or out radially when said bolts are shifted in said slots. The spacing apart of the depending flanges of the plates 63 is effected by means of the adjusting-screws 66. A sufficient number of the plates 63 is provided to have them arranged continuously about the core 43, with very little if any spacing apart of such plates. The outer curves of the plates 63 are eccentric to the core axis, and the radial recession of the flanged forward edges permits them to grasp and compress the tile-material and rub it smoothly against the inner wall of the outer mold-casing. The adjusting of the plates 57 and 63 radially outward permits either of taking up any loss of the surface thereof by friction, or allows them to be adjusted to vary the thickness of the tile. The shifting of such plates eccentrically permits of an adjustment suitable for handling different grades of material or tile-materials of different consistencies, and effect a grasp and compression upon such material as may be necessary accordingly.

The mechanism for driving the shafts 1 and 27 in opposite directions is described as follow: The axial sleeve of the upper core 55 is mounted on the lower end of the hollow shaft 27, while the sleeve 64 of the lower core 43 is mounted on the lower end of the solid shaft 1, the solid shaft being rotatable within the hollow shaft independently. Said shafts are received in bracketed bearings 7 and 45 attached to a backing-plate 8. This back-plate is fastened to the forward ends of horizontal beams 32 and 33, such beams being supported by the uprights 49 and 52 of the frame of the machine.

The hollow shaft 27 terminates just above the bracket-bearing 7, and is furnished at its upper end with a bevel-pinion 6. The solid shaft 1 extends upwardly prolonged above the pinion 6 and its upper end has a fillet which rests upon an upper bracket-bearing 2 attached to the backing-plate 8. A bevel-pinion 3 is secured to the shaft 1 under the bearing 2. A horizontal shaft 5 is rotatable in bearings 9 and 18 supported by the machine-frame, and has on its forward end a bevel-gear wheel 4 in mesh with the bevel-pinions 3 and 6. An idler-pulley 14 is mounted on said shaft 5, and carries a friction-ring or seat 19 adapted to receive a friction-cone 13 when the latter is shifted in one direction. Said friction-cone and its hub is slidably but non-rotatably mounted on said shaft 5, to slide over the feather 74 on said shaft. Said hub has an annular groove to receive the forked ends 11 of the upper member 20 of a bell-crank 22, which is pivoted at its angle on a stud 23 extending from a hanger 10 secured to the beam 32. The lower member of said bell-crank lever is pivotally-connected at 21 to the upper end of a connecting-rod 26, the lower end of the latter being pivotally connected at 29 to the short rear member 30 of a hand-lever 28, the latter being medially pivoted to the beam 33. The lever 28 is notched at a point on its lower edge to engage a pin 44 on the plate 8 to limit its downward movement. When the lever 28 is thrown either down or up the pivotal connection 29 is moved past its dead-center, and the friction-cone 13 is thrown into or out of contact with the friction-ring or seat 19. The pivoted joints of the connected parts are so contrived as to work somewhat stiffly, and thus hold any positions in which they may be placed at any time without regard to the influence of gravity. The power-pulley 14 thus imparts rotation to the shaft 5 in a well-known manner, and the bevel-gear-wheel 4 then rotates the bevel-pinions 3 and 6 in opposite directions, imparting the same movements to said shafts 1 and 27 and their respective core-plates 55 and 43. An upward movement of the lever 28 throws the connection 29 the other way past the dead-center, and the friction-cone is detached and held apart from the friction-ring 19, stopping the rotations of the shafts 1 and 27.

The outer mold-casing 41 is supported on the forward end of a vertically-movable table or carriage 56, the forward end of said carriage being formed in the shape of a ring with an annulus 42 to be the seat of the lower end of said casing. The circular opening of said ring 72 is of the same diameter as the outer diameter of the cylindrical exterior of the former heads and their forming-plates. The carriage 56 has sleeves 48 and 53 whose inner hollows 71 and 70 respectively fit them to move freely over the uprights 49 and 52.

25 represents a horizontal sleeve-bearing supported by the uprights 52 and 31, and in which a short shaft 24 is rotatably mounted. A large gear-wheel 16 is mounted on said shaft 24 and meshes with a pinion 17 on the power-shaft 5. A crank-pin 15 projects from the forward face of the gear-wheel 16, and on it is pivotally mounted the upper end of a connecting-rod 46, the lower end of the latter being pivoted on a pintle secured between the lugs 47 on the carriage 56. During one half of the rotation of the gear-wheel 16, the carriage 56 is elevated, and during the next half rotation the carriage is lowered, thus moving the mold-casing 41 up and down alternately about the forming-heads on the said shafts 1 and 27. 35 is a bar whose hollow sleeves 38 and 39 are slidable vertically over the uprights 49 and 52 respectively above the carriage 56, and on whose projecting forward end a small hopper 40 is mounted. The inner periphery of this hopper communicates with and is of the same interior diameter as the mold-casing 41. The rearwardly-projecting

end of the bar 35 is vertically orificed to permit the passage of a fixed vertical guide-bar 36, the beam or bar 35 moving over said guide-bar, but being limited in its downward movement by a projection or engaging-means such as a nut 37 on the lower end of said guide-bar. When the carriage moves upward its superposed casing 41 rises till its upper edge engages the overhanging hopper 40 and lifts the latter with it to the filling position indicated by the Fig. 1. Mixed materials are then deposited in the hopper flowing thence into the casing, and as the latter descends, such materials pass between the former-heads whose rotating engaging means form a tile between themselves and said casing. When the casing has lowered a certain distance, the nut 37 engages the bar 35, and disengages the hopper from the casing, the latter moving still farhtre downward to a position where the casing and inclosed tile may be removed and an empty casing substituted.

It will be seen that the adjustable forming-plates on the former-head cores may be adjusted without removal from the machine while at rest, and that they may be adjusted to take up wear and also to vary the thickness of the tile, and that their relative positions with regard to each other and such cores may be varied as to effect in use the amount of compression of the material desired while forming the tile. The opposite rotating of the former-heads also effects a more complete rubbing action and resultant homogeneity in the tile.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is:

1. In a tile machine, in combination, a mold-casing, concentric shafts oppositely rotatable in said casing, a core secured on each shaft and located one above the other, and eccentrically adjustable former-plates secured to each core, said cores and attached plates working within said casing and spaced apart therefrom.

2. In a tile machine, in combination, a mold-casing, oppositely-rotatable shafts in said casing, a core secured to each shaft, one being located above the other, former-plates detachably secured about the outer periphery of each core, each of said plates being both radially and eccentrically adjustable from the axis of its core, said cores and attached plates working within and spaced away from said mold-casing.

3. In a tile machine, in combination, a mold-casing, oppositely-rotatable cores in said casing located one above the other, former-plates adjustably secured to the upper core and separated from each other to leave a wide channel space therebetween, former-plates adjustably secured about the entire outer periphery of said lower core, said cores and their attached plates being adapted to rotate within and spaced apart from the interior wall of said mold-casing.

4. In a tile-machine, in combination, a mold-casing, oppositely-rotatable cores, eccentrically-adjustable former-plates secured about the exterior periphery of said cores, said cores being located one above the other, and means for alternately raising said mold-casing about said cores and lowering it therefrom while oppositely rotating said cores in said casing to form a tile therein, said cores and attached plates being spaced away from the interior wall of said casing a desired distance.

5. In a tile machine, in combination, a mold-casing, vertically-movable supporting-means for said mold-casing, a vertically-movable hopper above said casing adapted to register therewith and be carried thereby, after said casing has arrived at a certain stage of its upward movement and until it has moved downward thereafter to the same stage, means for limiting the downward movement of said hopper below said stage, oppositely-rotatable cores located one above the other within the axial line of vertical play of said mold-casing, said cores having eccentrically-adjustable molding-plates secured thereto, grouped about their outer edges and spaced away from the inner wall of said mold casing, and means for simultaneously moving said casing up and down and oppositely rotating said cores.

6. In a tile machine, in combination, a mold-casing, oppositely-rotatable cores in said casing located one above the other, oppositely located former-plates adjustably secured to the upper core and widely separated from each other to leave a channel between them leading to the lower core, the forward portions of the forming-plates on the upper core being forwardly and downwardly beveled, a plurality of former-plates adjustably secured to the lower core and located about the entire circumference of said core, the thickness horizontally of each plate diminishing from front to rear, and all such cores and their attached plates working within and spaced apart from the inner wall of said mold-casing to afford space for forming a tile therebetween of a desired thickness.

Signed at Waterloo, Iowa, this 8th day of Sept. 1908.

WILLIAM W. MYERS.
JESSE R. ROYER.

Witnesses:
G. C. KENNEDY,
O. D. YOUNG.