

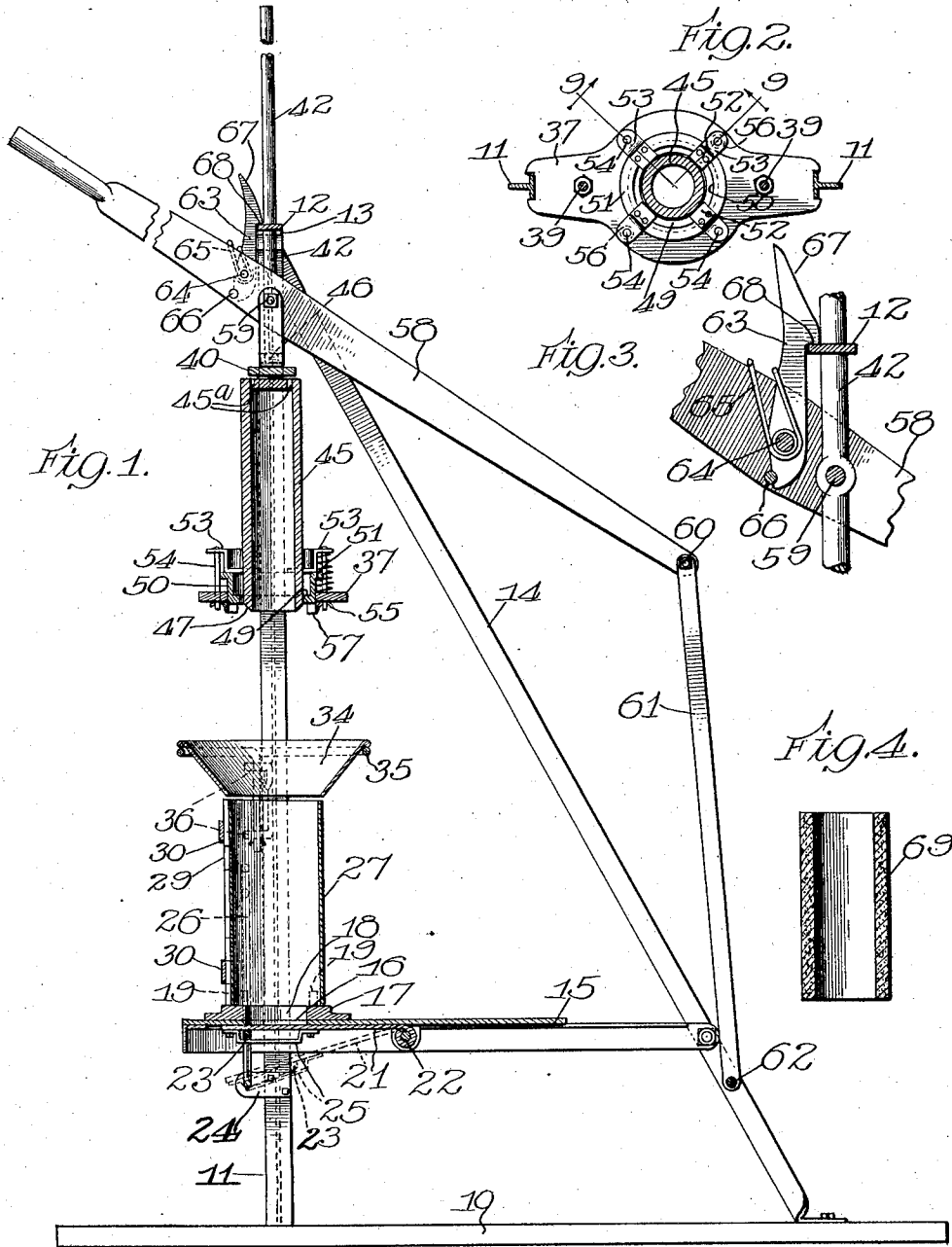
C. S. WERT.
TILE MACHINE.

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1,025,663.

Patented May 7, 1912.

2 SHEETS-SHEET 1.



Witnesses:

J. O. Bonarus Jr.

J. F. Gachum Jr.

Inventor:

Cyrus S. Wert

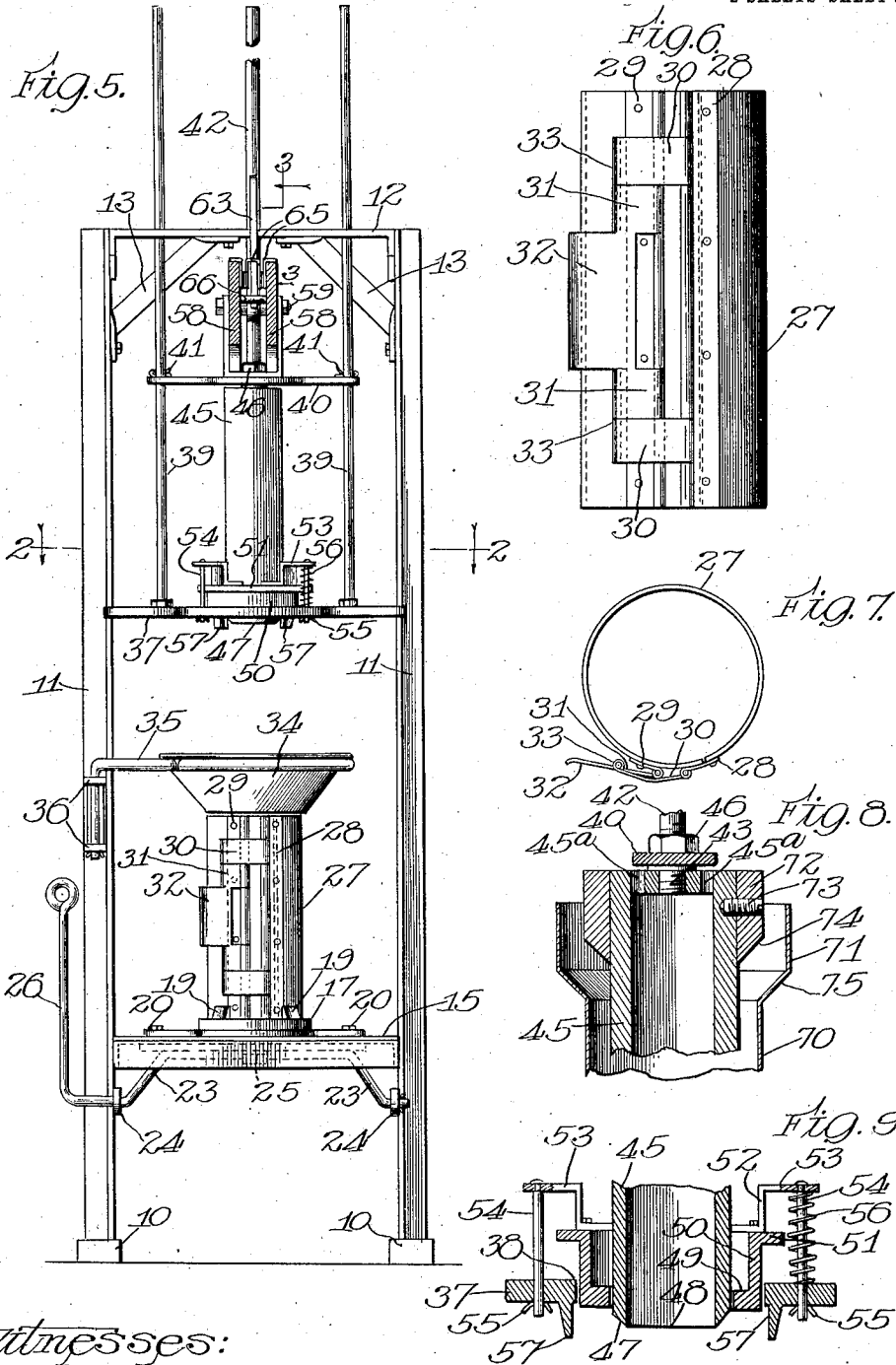
BY: Arthur Hopkins

Attys:

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2 SHEETS-SHEET 2.



Witnesses:

G. V. Bonaruz Jr.

J. F. Gochman Jr.

Inventor:

Cyrus S. Wert

By: Brown & Hopkins

Attys:

UNITED STATES PATENT OFFICE.

CYRUS S. WERT, OF KENDALLVILLE, INDIANA.

TILE-MACHINE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CYRUS S. WERT, a citizen of the United States, residing at Kendallville, in the county of Noble and State of Indiana, have invented certain new and useful Improvements in Tile-Machines, of which the following is a specification.

This invention relates to improvements in tile machines particularly adapted for manufacturing hollow tiles, such as drain tiles or the like, and one of the objects is to provide an improved machine of this character having means whereby the tile may be formed and tamped within the mold.

A further object is to provide an improved machine of this class having a core adapted to be forced into the mold to shape and expand the material within the form or mold, a further object being the provision of an improved machine of this class having a yielding tamping attachment carried with and operating in unison with the core.

A further object is to provide an improved machine of this class having a mold or form support provided with an opening to permit the material removed by the core to be discharged therethrough, a further object being the provision of a closure for the opening for retaining the material within the mold or form while the latter is being filled.

A further object is to provide an improved mold or form which is adapted to be expanded for releasing the tile formed therein.

A further object is to provide an improved machine of this class which will be simple, durable and cheap in construction, and effective and efficient in operation.

To the attainment of these ends and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty hereinafter more fully described and claimed and substantially as shown in the accompanying drawings exemplifying the invention, and in which—

Figure 1 is a longitudinal vertical sectional view of an improved machine of this class constructed in accordance with the principles of this invention. Fig. 2 is an enlarged detail sectional view on line 2—2, Fig. 5. Fig. 3 is an enlarged detail sectional view on line 3—3, Fig. 5. Fig. 4 is

a longitudinal sectional view of a tile constructed by this improved machine. Fig. 5 is a front elevation of Fig. 1. Fig. 6 is an elevation of the mold or form in which the material is constructed. Fig. 7 is a top plan view of Fig. 6. Fig. 8 is a view of a modified form of the core and mold. Fig. 9 is a detail sectional view on line 9—9, Fig. 2.

Referring more particularly to the drawings and in the present exemplification of the invention the numeral 10 designates a supporting base which may be of any suitable structure, and rising from the base are uprights 11 which may be of any suitable configuration and of any desired height. These uprights are preferably of angle iron construction and their upper extremities may be connected by a cross bar or member 12, the latter being braced by means of braces 13 to impart rigidity to the frame thus formed. The base members 10 preferably extend for some distance to the rear of the uprights 12 and braces 14 may be provided which extend from points adjacent the upper extremities of the uprights to the base 10 and are secured in position in any desired or suitable manner.

A support 15 of any desired or suitable construction is provided and is arranged preferably some distance above the base 10 and this support 15 is provided adjacent the front thereof with an aperture or opening therethrough and this opening is preferably located between the uprights 11. Mounted upon the support 15 and secured thereto against accidental displacement is a frame 17 having an aperture or opening 18 therethrough which registers with the aperture or opening 16 in the support 15 and projecting above the frame 17 are ears or lugs 19 which are arranged around the opening 18 for a purpose to be hereinafter set forth. This frame 17 is preferably removably secured to the support 15 by means of suitable fastening devices 20 whereby the frame may be readily removed from the support when desired. The support 15 is preferably of a width substantially equal to the space between the uprights 11 and serves as a means for imparting rigidity to the frame.

Arranged below the support 15 is a damper 21 which is mounted in any desired

or suitable manner and upon any suitable support for pivotal movement about an axis 22 and is adapted to form a closure for the opening 16 in the support 15. A crank 23 is mounted for pivotal movement preferably in brackets 24 secured to the uprights 11 and a portion of the crank moves in a guide 25 carried by the damper or closure 21. One end of the crank 23 is preferably formed into a handle 26 which latter is preferably located to one side of the machine and in a convenient position for the operator. The crank 23 is so arranged that when the handle 26 is in an upright position, it will close the damper 21 and will serve as a support for the damper to maintain the same in a closed position. The guide 25 is preferably located adjacent the front of the damper or closure 21 and remote from its point of pivotal support 22. When the handle 26 is lowered or moved from its upright position, the forward end of the damper or closure 21 will also be lowered and the damper or closure will from an incline or chute by means of which any material falling through the opening 16 in the support 15 may be directed toward the front of the machine.

The frame 17 is provided for the purpose of supporting and holding a mold or form 27 in position and this mold or form 27 is preferably circular in construction and is formed of a single piece of flexible material. Secured to the edges of the material are reinforcing members 28, 29, pivotally connected to the free edges of which are links 30, 31. One of the links, preferably the link 31, is extended to form a handle 32 and the free extremities of the other link 30 are pivotally connected as at 33 to the extended portion of the link 31, as shown in Fig. 7. The reinforcing member 28 is so arranged that when the edges of the elastic material 27 are brought in close proximity to each other it will overlap the edges of the mold and when in this position the mold will be held in its contracted shape by means of the handle 32 which is adjusted to such a position as to cause the point of pivotal connection of the link 31 therewith to pass over the center. This mold or form is of a diameter slightly less than the diameter of the space between the lugs or projections 19 and the interior diameter of the mold or form is greater than the diameter of the opening 18 in the frame 17. When the mold or form is placed in position upon the frame 17, one end thereof will pass within the lugs or ears 19 and the mold will be maintained in an upright position. Pivotally supported, preferably upon one of the uprights 11, is a hopper 34 which is mounted upon a frame 35, the latter being pivoted in suitable brackets 36 so as to move on an upright axis. The hopper 34 is adapted to be swung about

its point of pivotal support in the position shown in Fig. 5 so that the open bottom thereof will register with the mold or form 27. In this position and when the damper or closure 21 is adjusted to close the opening 16, the material of which the tile is to be formed is placed into the mold by being discharged from the hopper 34. After the mold is filled, the hopper may be swung about its point of pivotal support and the excess material will be scraped from the top of the mold.

Mounted to move upon the uprights 11, which latter form guides, is a cross head 37 which is arranged above the hopper 34 and this cross head is provided with an opening 38 passing therethrough and preferably located centrally thereof, as shown more clearly in Fig. 9. Rising from the cross head 37 are upright bars or rods 39 which pass through suitable openings in the cross bar 12 at the top of the uprights 11 and form guides for holding the cross head 37 in proper position to prevent binding upon the frame. A cross bar 40 is arranged above the cross head 37 any suitable distance thereabove, and is provided with apertures or openings through which the bars or rods 39 pass and fastening devices 41 such as cotter pins or the like engage the bars or rods 39 above the cross bar 40 and serve as a means for supporting the cross head 37. Passing through the cross bar 40 is a bar or rod 42 which is arranged between the bars or rods 39 and projects upwardly to pass through the cross bar 12. The lower extremity of this bar or rod 42 is threaded as at 43 (see Fig. 8) and this threaded extremity, below the bar or rod 40, passes into a threaded aperture in the closed end of a hollow core 45, and a lock nut 46 may be provided on the threaded extremity of the rod.

The core 45 in the present exemplification of the invention is cylindrical and is of any desired length according to the length of tile to be manufactured and is also of a length to correspond with the height of the mold or form 27. The lower extremity of the core 45 is beveled as at 47 to form a sharp edge 48. The aperture or opening 38 in the cross head 37 is of a diameter somewhat greater than the diameter of the core 45 and arranged between the periphery of the core and the wall of the opening 38 is a collar 49 having an upwardly projecting flange 50 to extend some distance above the cross head 37 and the upper edge of the flange 50 is provided with a radial flange 51 projecting outwardly beyond the periphery of the flange. Supported by the upper edge of the flange 50 are brackets 52 which are secured in position in any desired or suitable manner and these brackets are provided with laterally deflected portions 53

extending for some distance beyond the periphery of the flange 51 of the collar 49 and projecting over the cross head 37.

Secured to the laterally deflected portions 53 of the brackets 52 are bars or rods 54 which depend therefrom and project through openings in the cross head 37 and beyond the lower face thereof. Fastening devices 55 such as pins or the like pass through the extremities of these bars or rods 54 below the cross heads 37 and serve as means for preventing disengagement of the bars or rods from the cross head. Elastic members 56 such as coil springs or the like are provided and surround some of the bars or rods 54 between the flanges 53 and the cross head 37 and these elastic members tend normally to support the collar 49 through the medium of the brackets 52. The core 45 is of such a length that the lower edge 48 thereof will normally project a slight distance below the lower face of the cross head 37 and pass loosely through the collar 49 while the collar in turn passes loosely through the aperture 38 in the cross head 37.

Depending from the cross head 37 are ears or projections 57 which are adapted to pass over the upper edge of the form 27 when the cross head 37 is lowered and serve as a means for holding the mold in position while the core 45 is being forced into the material in the mold in a manner to be presently described.

The cross head 37 together with the core 45 may be raised or lowered in any desired or suitable manner but preferably by means of an operating lever or handle 58 which is provided preferably with a bifurcated portion through which the bar or rod 42 passes and this bar or rod is pivotally connected to the handle or lever 58 in any desired or suitable manner, preferably by means of a pivot pin 59 passing through both. One end of the lever is pivotally connected as at 60 to a link 61 which latter is in turn pivotally connected as at 62 to any suitable support preferably the braces 14. The handle of the lever projects in any desired distance beyond the front of the machine which is convenient for the operator. It will thus be seen that when the handle 58 is lowered from the position shown in Fig. 1, the core 45 will also be lowered and after the hopper 34 has been swung out of the way, the lips or projections 57 on the cross head will pass on the outside of the mold or form 27 and the cross head will descend until its movement is arrested by its engagement with the end of the mold or form. As the core is advanced into the material, the inclined or beveled face 47 will force the material outwardly against the wall of the mold while the sharp edge 48 will cut through the material and will remove a core from the material. The core 45 will continue to be low-

ered by the lever 58 until the cross bar 40 engages the flange 51 on the collar 49, the brackets 53 being so arranged that the bar or rod 40 will move into engagement with this flange. Obviously the damper or closure 21 must be opened to permit the material which is cut out by the core to be discharged through the opening 16. When the core 45 has reached the limit of its downward movement, the material in the mold between the core and the mold may be tamped by the lever 58 by raising and lowering the same so that the bar 40 will strike the flange 51 on the collar 49 and force the collar into the mold against the material, and against the tension of the elastic members 56. When the lever 58 is raised the springs 56 will raise the collar 49 and when the bar 40 is forced into engagement with the flange 51 the collar will be forced into the mold. It will thus be manifest that a tile may be rapidly formed and tamped within the mold in practically one operation of the machine. After the tile has thus been formed, the lever 58 is raised so as to remove the core 45 from the mold and to raise the parts of the former out of the way. In order to maintain these parts elevated so as to permit the removal of the mold and the filling of a new mold, any suitable means may be provided. A simple and efficient means for accomplishing this result comprises a catch 63 which is preferably pivoted as at 64 to the lever 58 and an elastic member 65, such as a spring, tends normally to force the catch 63 in an operating direction and the tension of the elastic member may be resisted by means of a stop 66 with which one end of the catch 63 engages. This catch 63 preferably projects above the lever 58 and is provided with a beveled or inclined face 67 which is adapted to strike the edge of the cross bar 12 as the lever is raised to deflect the catch against the tension of the spring 65. When the shoulder 68 of the catch passes above the cross bar 12, the spring 65 will force the shoulder over the cross bar and the parts will be thus locked in an elevated position. After the tile has been completed, the mold or form 27 may be lifted from the frame, the handle 32 swung about its pivots, which will cause the pivot point 33 to pass over the center, and will expand the mold thereby permitting it to be easily removed from the tile.

The form of core which has just been described is employed for constructing a tile 69 of the shape shown in Fig. 4. This same machine may be employed for constructing what is known as sewer tiles, which tiles have at one end a bell adapted to receive one extremity of the next adjacent tile. In order to adapt this machine for manufacturing such tiles, a mold or form 70 is provided (see Fig. 8) which is provided with an en-

larged upper extremity 71 and a collar 72 is placed upon the upper extremity of the core 45 and is removably secured thereto in any desired or suitable manner, preferably by means of a fastening device 73. This collar 72 increases the diameter of the core at the upper end or that portion which will stand within the enlarged portion 71 of the mold 70 when the core has reached the limit of its downward movement. The lower edge of the collar 72 is beveled or inclined as at 74 to correspond with the inclined or deflected portion 75 of the mold 70. It will be manifest that a tile of this character may be readily constructed in a similar manner and the material will be forced against the mold 70 in the manner as already described, and the material within the mold may be likewise tamped. By providing the collar 72 which is adapted to be removably secured to the core 45, it will be apparent that the machine may be readily and quickly adapted for manufacturing either form of tiles without dismantling any material part of the mechanism. The mold 70 is preferably of the same general structure as the mold 27. The core 45 is provided in its upper end with openings 45^a through which air may be admitted into the core to permit the material to readily discharge through the open end thereof.

What is claimed as new is—

1. In a machine of the class described, the combination of a mold having an open end, means for supporting the mold in position to receive the material, a core adapted to be forced into the material within the mold, means for moving the core into and out of the mold, and yieldingly supported means operating in unison with the core for tamping the material, said core moving means being movable into and out of engagement with the tamper to tamp the material.

2. In a machine of the class described, the combination of a mold, a core, means for forcing the core into the mold to shape the material therein, a yieldingly supported tamper movable in unison with the core, and means movable with the first recited means,

and into and out of engagement with the tamper for operating the latter to tamp the material.

3. In a machine of the class described, the combination of a mold, a hollow core, means for forcing the core into the mold to shape the material therein, a yieldingly supported tamper movable in unison with the core, means operatively related to the first recited means, movable into and out of engagement with the tamper for operating the latter to tamp the material, and means for guiding the core and tamper.

4. In a machine of the class described, the combination of a mold, having an open end, a support for holding the mold in position to receive the material, means movable into engagement with the upper end of the mold for holding the latter in position, a hollow core, means for forcing the core into the mold to shape the material therein, a yieldingly supported tamper movable in unison with the core, and means operatively related to the first recited means movable into and out of engagement with the tamper for operating the latter to tamp the material.

5. In a machine of the class described, the combination of a frame, a support thereon having an opening therethrough, a hollow mold, means for holding the mold in position on the support with one end over the said opening, a closure for the opening, a hollow core movable into the mold to shape the material and to remove a portion of the material, a tamper operating in unison with the core for tamping the material, and means for controlling the said closure whereby the material removed by the core may be discharged from the mold and through said opening, said closure also serving as a deflector for the discharged material.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 18th day of February, A. D. 1911.

CYRUS S. WERT.

Witnesses:

J. H. JOCHUM, Jr.,

C. H. SEEM.