W. H. DOUGHERTY.

MOLDING APPARATUS.

APPLICATION FILED NOV. 6, 1916.

1,236,410.

Patented Aug. 14, 1917.

2 SHEETS—SHEET 1.

Fig. 2.

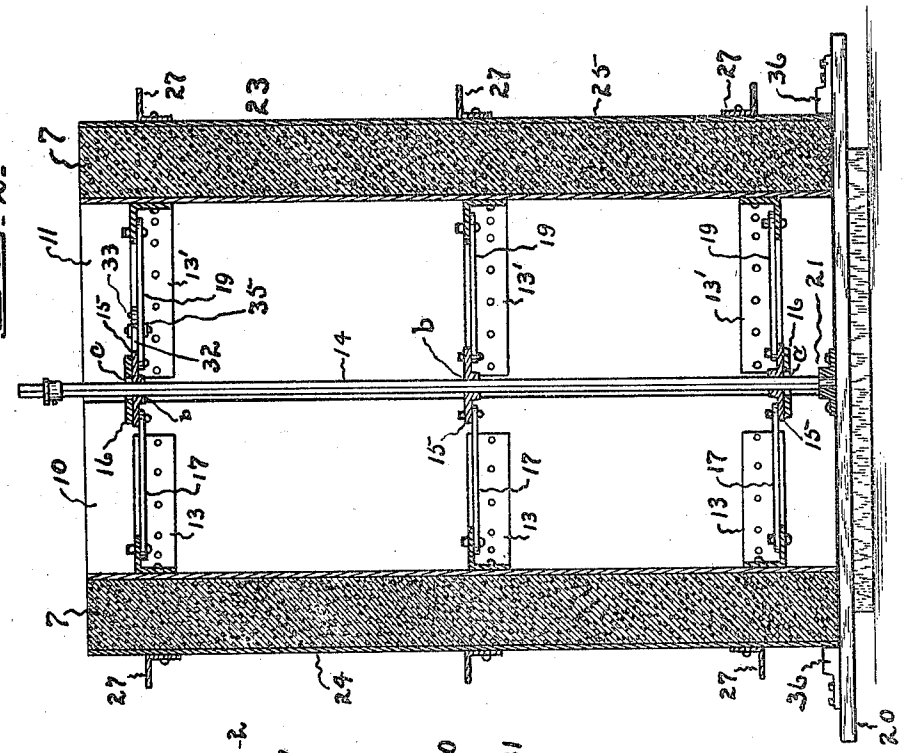



Fig. 1.

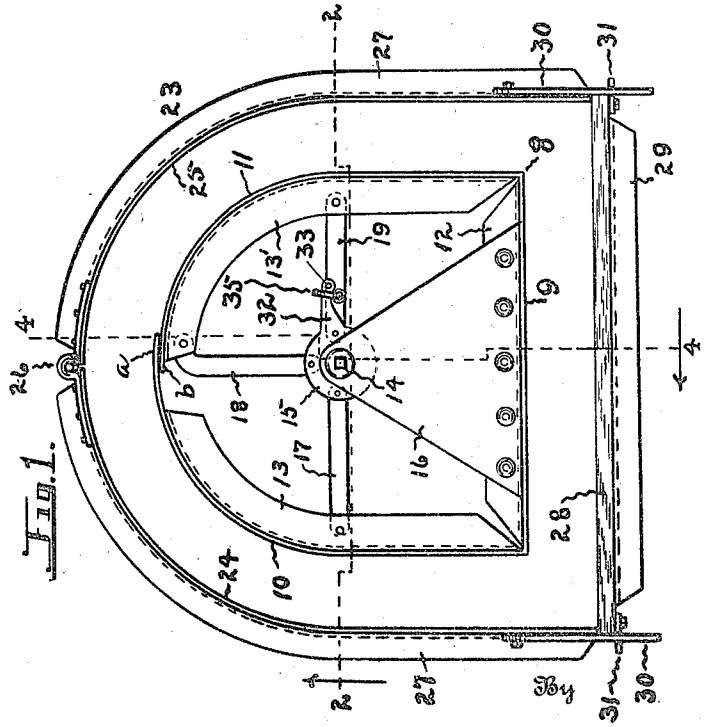
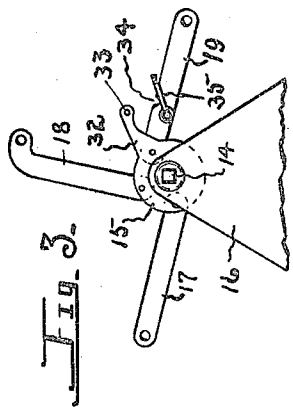



Fig. 3.




Inventor

William H. Dougherty.

By Hiram A. Sturges.

Attorney

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2 SHEETS—SHEET 2.

Fig. 5.

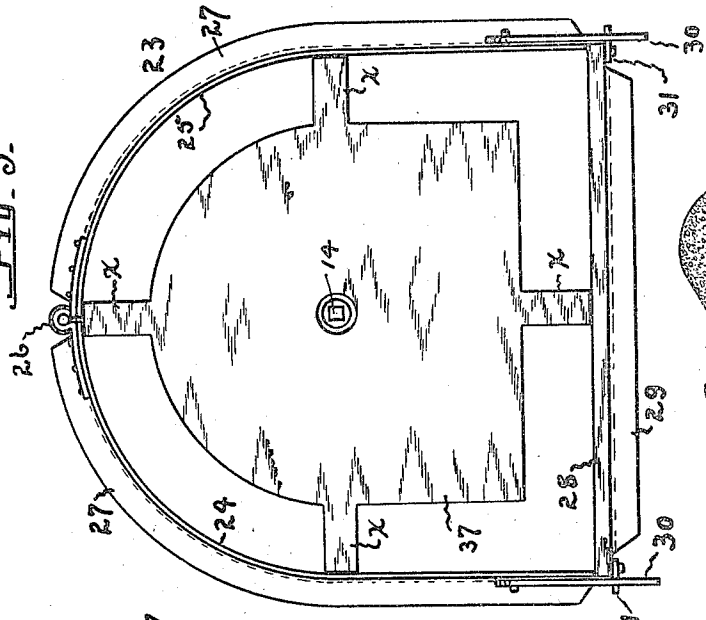



Fig. 6.

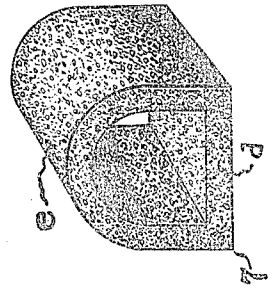
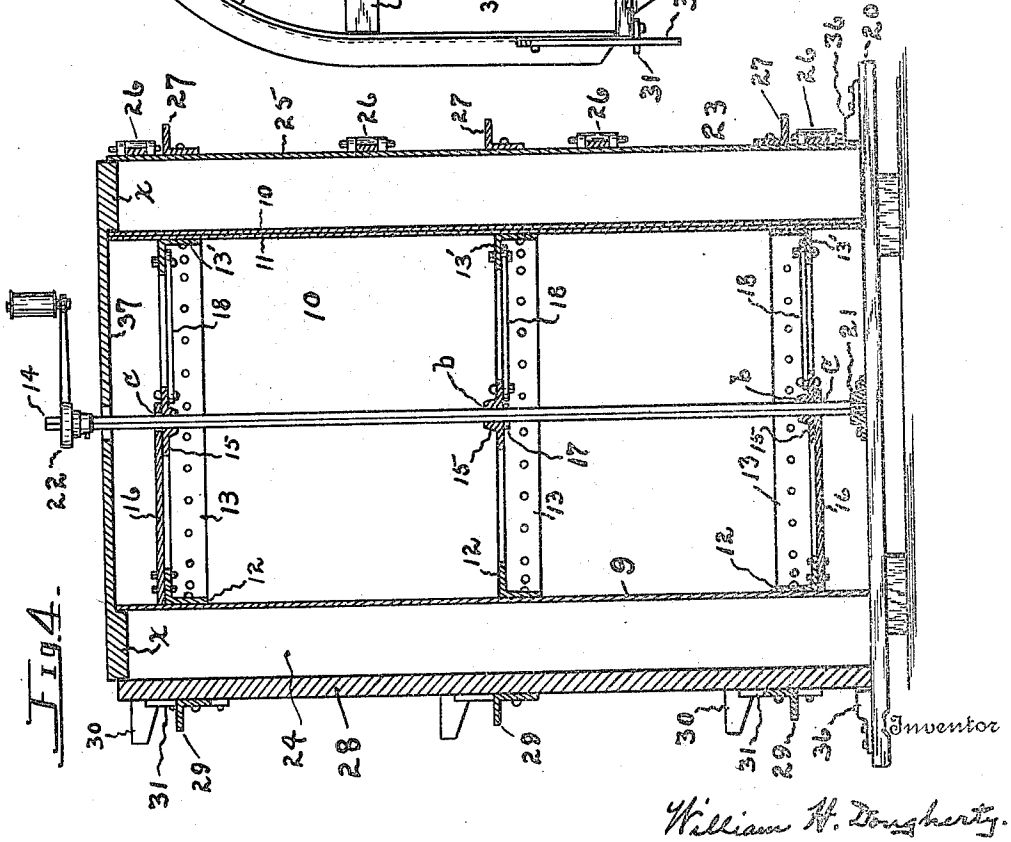



Fig. 4.




Inventor

William H. Dougherty.

By Hiram A. Sturges.

Attorney

# UNITED STATES PATENT OFFICE.

WILLIAM H. DOUGHERTY, OF DAVID CITY, NEBRASKA.

## MOLDING APPARATUS.

1,236,410. Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed November 6, 1916. Serial No. 129,906.

*To all whom it may concern:*

Be it known that I, WILLIAM H. DOUGHERTY, a citizen of the United States, residing at David City, in the county of Butler and State of Nebraska, have invented certain new and useful Improvements in Molding Apparatus, of which the following is a specification.

This invention relates to an improvement in a molding apparatus, and has for its object to provide a device for use in forming cement culverts, which will be convenient in operation and may be economically produced.

The invention consists of the novel construction, combination and arrangement of parts as described herein and claimed, and as illustrated in the accompanying drawing, wherein,—

Figure 1 is a plan view of the apparatus. Fig. 2 is a vertical longitudinal section on line 2 2 of Fig. 1, a pallet and molded cement also being shown. Fig. 3 is a detail view relating to Fig. 1. Fig. 4 is a vertical longitudinal section on line 4—4 of Fig. 1, a pallet, crank and cover being added. Fig. 5 is a plan view of the apparatus showing the cover or alining device. Fig. 6 is a perspective view of a cement culvert-section.

Referring now to the drawing for a more particular description, to form cement culvert-sections or tile 7, I provide, by use of a single, rectangular, metallic sheet, an inner collapsible casing or core 8 (Fig. 1.), open at both of its ends, said metallic sheet being bent between two opposed edges to provide a flat, rectangular surface for one of its sides 9 and to form two inwardly convergent sides 10 and 11 with their respective edges *a* and *b* normally disposed in engagement, one overlapping the other, opposite to the flat side 9.

One advantage in the use of sheet metal is its comparatively light weight. In order that buckling of the sheet metal may be prevented, the side 9 is provided, on its inner surface, with strips 12 of angle iron, these being disposed substantially parallel and suitably spaced apart, and the sides 10 and 11 are provided with a plurality of curved angle irons 13 and 13′ for the same purpose.

To cause collapsing of the inner mold or core 8, a shaft 14, angular in cross-section, is provided. At 15 are indicated a plurality of cams, each being provided with an aperture *b* formed angular in plan so that they may have rotatable movements with the shaft. Numerals 16 indicate a pair of brackets, each being mounted upon a flange of an angle iron 12 at or near the ends of the casing or core, each bracket having an inwardly convergent terminal with a circular aperture *c* in which the shaft may be disposed. At 17 are indicated radially disposed links, each being pivotally mounted at its outer end upon a flange of a curved angle iron 13 and having its inner end pivotally mounted upon a cam 15; also links 18 and 19 are provided each having its outer end pivotally mounted on a flange of an angle iron 13′ and having its inner end pivotally mounted on a cam.

A suitably supported horizontal pallet is indicated at 20, and it is provided at its middle with a suitable support or socket 21 in which the cylindrically formed lower end of the shaft 14 may have bearings, the core or casing 8 being disposed vertically upon the pallet; and from the description it will be understood that by use of a crank 22 applied to the upper end of the shaft, said shaft may have a limited rotatable movement in one direction to cause the sides 10 and 11 to swing inwardly toward each other, the links 17, 18 and 19 being moved inwardly of the casing by the resulting rotatable movement of the cams.

An outer molding member is indicated at 23 which consists, in part, of a pair of wings 24 and 25, each being constructed, preferably, of a rectangular, metallic sheet bent to a form corresponding substantially to the form of the sides 10 and 11 of the inner casing, said wings being connected at one of their longitudinal edges by the hinges 26; and to prevent buckling, said wings are provided, at longitudinal intervals, with the transversely disposed angle irons 27.

To provide a removable, flat side for the molding member 23, a plate 28 is employed, preferably constructed of wood, and reinforced by angle irons 29. It may be removably connected with the wings 24 and 25 by use of latches 30 which are pivotally mounted upon the wings, said latches co-acting with catches 31 which are secured upon the rectilinear plate 28.

One of the cams 15, and preferably the cam near the upper end of the core, is provided with a finger 32 having a lug 33 secured in its outer end, the link 19 which is

connected with this cam being provided with a notch 34 and a keeper or movable loop 35, and in operation, to form a section 7 for a culvert or sewer, the core or inner molding member 8 is disposed vertically upon the pallet 20 as above mentioned, and by use of the crank, the axle may be rotated in one direction until the lug 33 enters the groove or notch 34. The loop 35 is then swung in a manner to secure or lock the finger upon the link 19 and thereby preventing any rotatable movement of the cams or shaft, which otherwise might be caused by jolts or vibrations incident to the use of the apparatus. The outer molding member 23 is then placed vertically upon the pallet to circumscribe the inner molding member or core, the wings 24 and 25 being connected with the plate 28 by means of the latches engaging the catches, said outer molding member being in engagement with the aligning blocks 36 with which the pallet is provided, and since the area, in plan, of the outer molding member is greater than the area, in plan, of the core 8, the space between these members will form the flat base *d* and the arch *e* of the cement section 7 for culverts.

It will be seen that the thickness of the walls of the culvert sections will be uniform, since any lateral movements of the core and outer molding member, relative to each other, will be prevented while the sections are being formed, the lower, open ends of said members being securely held upon the pallet, as described. At 37 is indicated a cover which prevents a deposit of the plastic cement upon the interior mechanism, and which provides spacing blocks *x* which may be interposed, as best shown in Fig. 4, between the outer and inner walls of the apparatus, so that relative, lateral movements of the upper ends of these walls, will be prevented. After the plastic cement or other adhesive material has been deposited so that the space between the outer and inner walls has been nearly filled, the cover is then removed so that the space occupied by the spacing blocks *x* may be filled.

It will be understood that the apparatus may be constructed of various sizes to provide large sections for culverts or sewers, or small sections for producing tile for drainage or other purposes, and that the material used may be cement or any other plastic, adhesive substance adapted to be molded.

To remove the core after a section has been molded, after the loop 35 has been released from the finger 32, the cams 15 may be partly rotated by causing a part rotation of the axle, the sides 10 and 11 of the core swinging inwardly so that the core will occupy a lesser space, and may be withdrawn from the section, and it is obvious that the outer molding member 23 may be removed, since the hingeably connected wings 24 and 25 may be swung outwardly after the plate 28 has been detached from said wings by raising the latches from the catches.

Having fully explained construction, a further explanation relating to operation is not necessary.

What I claim as my invention and desire to secure by Letters Patent is,—

A molding apparatus including an inner sheet metal wall member formed with a rectilinear portion and convergent sides formed by bending said sheet-metal member at the terminals of said rectilinear portion and overlapping the terminals of the curved portions of said convergent sides, said rectilinear and convergent portions having reinforcing angular metal members secured thereto upon their inner edges, the end-ones of said reinforcing angular metal-members having secured thereto a pair of inwardly extending brackets, a shaft angular in cross-section and journaled in the inner ends of said brackets and provided with fixed cam-members, and link-connections between said cams and the first referred to angular metal-members.

In testimony whereof, I have affixed my signature in presence of two witnesses.

WILLIAM H. DOUGHERTY.

Witnesses:
P. McGURK,
GEO. D. COOPER.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**