No. 809,504. PATENTED JAN. 9, 1906.

G. HENNINGSEN.

MOLD FORMING MECHANISM.

APPLICATION FILED SEPT. 28, 1905.

3 SHEETS—SHEET 1.

Fig. 1

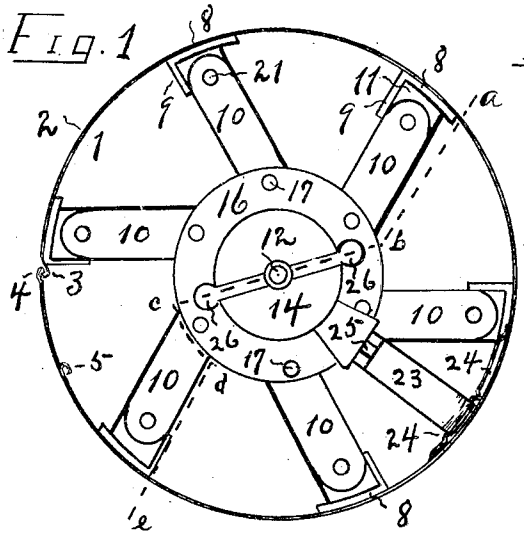


Fig. 2.

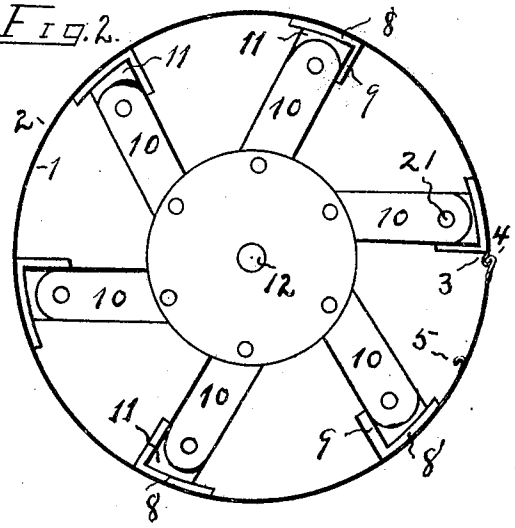
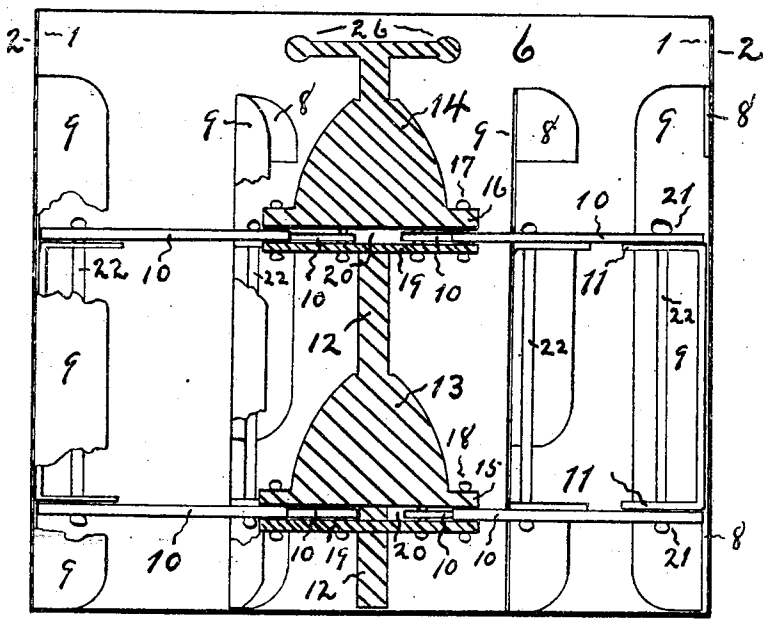


Fig. 3.



George Henningsen, Inventor

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Attorney

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3 SHEETS—SHEET 2.

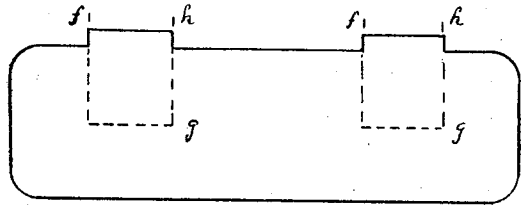
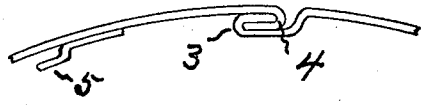


Fig. 4.

Fig. 5.



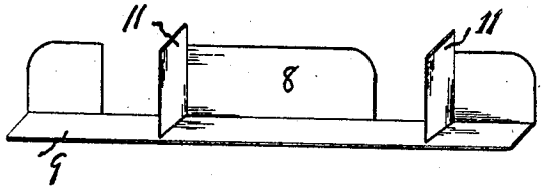


Fig. 6.

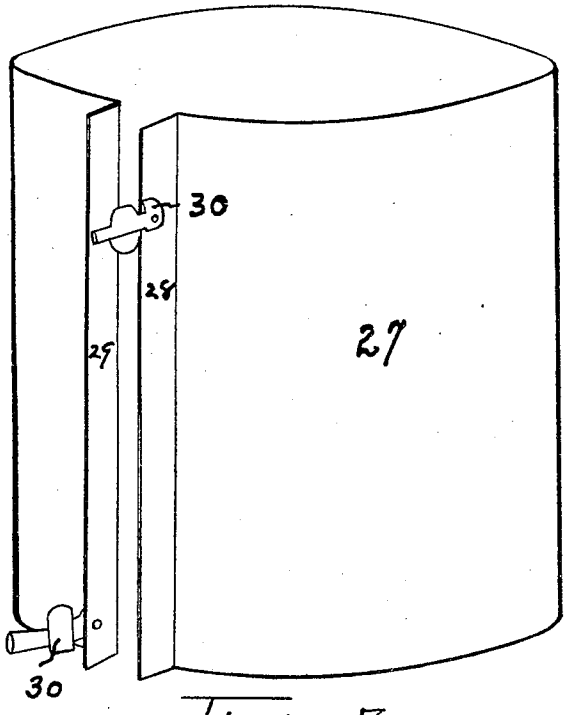


Fig. 7.

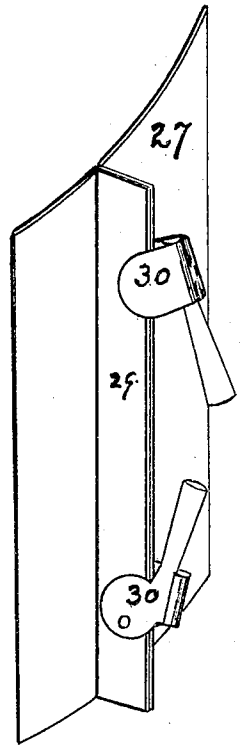


Fig. 8.

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G. HENNINGSEN.

MOLD FORMING MECHANISM.

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3 SHEETS—SHEET 3.

Fig. 9.

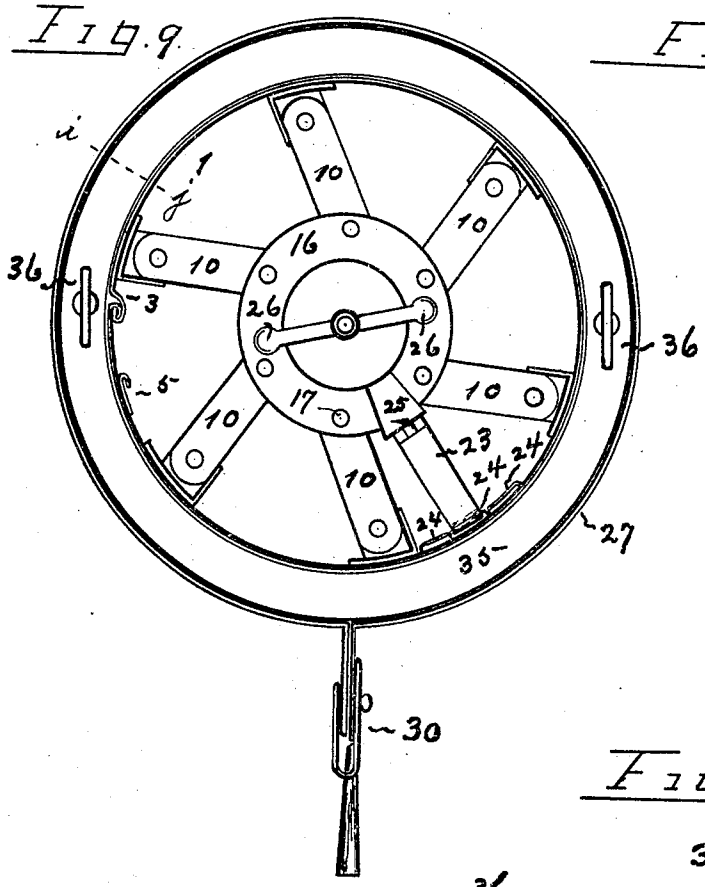


Fig. 10.

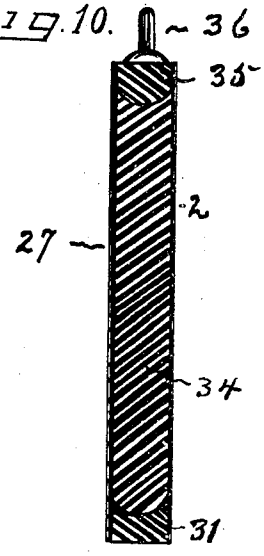


Fig. 11.

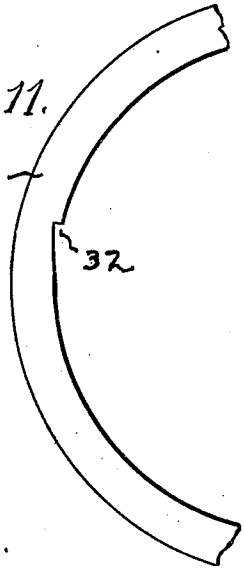


Fig. 12.

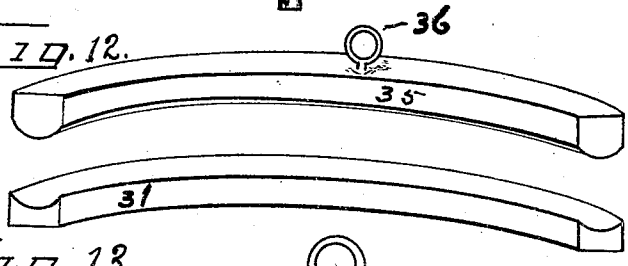


Fig. 13.

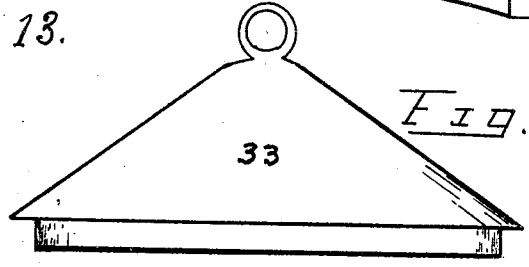


Fig. 14.

Witnesses

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George W. Covell

By

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UNITED STATES PATENT OFFICE.

GEORGE HENNINGSEN, OF KIMBALLTON, IOWA, ASSIGNOR TO HENNINGSEN & JENSEN, A FIRM.

MOLD-FORMING MECHANISM.

No. 809,504. Specification of Letters Patent. Patented Jan. 9, 1906.

Application filed September 28, 1905. Serial No. 280,444.

To all whom it may concern:

Be it known that I, GEORGE HENNINGSEN, a citizen of the United States, residing at Kimballton, in the county of Audubon and State of Iowa, have invented certain new and useful Improvements in Mold-Forming Mechanism, of which the following is a specification.

My invention relates to improvements in mold-forming mechanism for use in manufacturing cement tiles, more particularly the large tiles for culverts and wells.

The object of the invention is to provide a means for reducing or enlarging the inner mold and means for removal of the outer and inner mold from the tile after the tile has been formed. The invention also introduces an economy in material used for constructing the molds. In forming tiles of the above class a large number of molds are employed, and on account of the mechanism employed sheet-iron may be used instead of a more costly material.

The invention also has reference to a method of forming convex and concave end walls for tiles.

With these and other objects in view the invention presents a novel construction and arrangement of parts, as fully described herein and illustrated by the drawings, wherein—

Figures 1 and 2 represent, respectively, a plan view and a bottom view of the adjustable inner mold and mechanism contained therein. Fig. 3 represents a vertical sectional view of Fig. 1 bisected on the line *a*, *b*, *c*, *d*, and *e* with part-torn-away portions to illustrate structural arrangement of parts. Figs. 4 and 6 are horizontal views of the vertical brackets 7 with arms 8 and 9, shown in Fig. 3, to illustrate method of forming the same. Fig. 5 is an enlarged detail to illustrate formation of flanges 3, 4, and 5, shown in Fig. 1. Fig. 7 represents a perspective view of the outer mold. Fig. 8 is a detail of Fig. 7 to illustrate fastening means. Fig. 9 represents a plan view of the inner and outer mold and concave end mold. Fig. 10 is a vertical sectional view of Fig. 9 bisected on the line *i j*. Fig. 11 is a bottom view of a portion of the convex or lower molding-rim. Figs. 12 and 13 are perspective views of portions of the upper and lower molding-rims, and Fig. 14 represents a side elevation of the cover for the inner mold.

It is desirable after the cement has been prepared to form the tiles quickly, and for this purpose the devices for forming the tile should be under ready control and convenient, and consequently the invention presents means of adjustment as a part of the molds. Sheet-iron or metal of similar character is used for both the inner and outer molds, the surfaces that contact with the cement being smooth. After the tile has been formed it is simply a hollow cylinder with side walls of uniform thickness, the upper end wall having a curved or depressed groove and the lower end wall having a rounded finish, so that when tiles of equal sizes are placed end to end or one upon the other, as in a culvert or well, the ends are adapted to be accurately joined. In the matter of mounting the devices within the inner mold a heavy soldering or brazing should be resorted to, and if perforations of this mold are made to receive rivets the fitting of the rivet-heads should be countersunk, so that the outside surface will remain smooth; but in practice I find brazing or soldering to be preferred, and therefore I have presented by Figs. 4 and 6 a method of cutting brackets which is useful where thin metals are employed adapted to receive soldering.

I form an inner hollow circular mold 6, having the inner and outer walls 1 and 2, using for this purpose a sheet of rectangular form, and upon the ends thus brought together I form the flanges 3 and 4, Figs. 1, 2, 5, and near flange 4 upon the inner wall 1 is rigidly mounted the flange 5. These flanges continue the entire width of the plate which constitutes the inner mold and after being suitably hooked together produce a circular mold adapted to have a varying diameter. Upon the inner wall 1 are rigidly mounted brackets 7, Fig. 6, the arm 8 thereof being rigidly adherent to the wall 1 and arm 9 thereof extending toward the center of the mold to form a support for the links 10. I find it an advantage to form the bracket of one integral sheet, as shown by Fig. 4, and make an incision, as upon the broken line *f g*, and bend the leaf 11 toward the center of the sheet to a right angle, as upon the line *g h*, the leaf 11 being then made rigidly adhesive to the arm 9 to form a pivotal bearing for the outer ends of links 10. I construct the shaft 12, placed at the center of the inner mold 6 and parallel with wall 1, and in order to afford a convenient central pivotal bearing for links 10 I form the cones 13 and 14, the bases 15 and 16 supplying the pivotal bearings 17 and

18 for the inner ends of links 10, the plates 19 extending horizontally and parallel with and beneath the bases of the cones, so that the pivotal mounting of the several links may be in true alinement, also to afford a suitable continuous slot 20, within which the inner ends of links 10 may rotate.

By the construction described the links 10 have a pivotal mounting at their outer ends at 21 upon leaves 11 of brackets 7, and for this mounting I employ the rods 22. The rods 22 connect the two leaves 11 of brackets 7 and extend parallel with the lengthwise wall 1 of the inner mold.

I construct the clasp 23, hingeably mounted at 25 upon the base 16 of the upper cone, adapted to catch within any one of the pockets 24, Figs. 1, 9.

The shaft 12 extends as far as the lower end of mold 6, and when the parts are in operative position the lower end of shaft 12 rests upon the same level foundation as mold 6. Shaft 12 therefore acts as a support for the central weight of the cones and links, the upper end of the shaft terminating in the angularly-extending handles 26, and since the shaft and cones are of metal and of preferably heavy construction they afford sufficient momentum to cause the links to move readily.

It will be understood from the description that the handles 26 may be revolubly moved to rotate the shaft 12 in either direction, carrying therewith the links 10, and that a slight rotating movement will be sufficient to cause the mold 6 to be of greater or lesser diameter, and this is a desired object in order to form the body of a tile of greater or lesser thickness, and after manipulation of handles 26 flange 3 is made to engage flange 4 or 5, as desired, the clasp 23 being placed within one of the pockets 24 to prevent sidewise movement of the links.

I construct a circular outer mold 27, Figs. 7, 8, 9, 10, of greater diameter than mold 6 by using a single sheet of iron provided with bent parallel flanges 28 and 29 at the ends of the sheet, and upon each flange I pivotally mount a convenient clasp 30, so that each clasp may engage the opposite flange to cause a ready engagement or disengagement of these flanges, as shown in Figs. 7 and 8.

The outer and inner molds are of substantially the same height, and in operation, both molds having been locked by their respective hooks and clasps, mold 6 is placed vertically within mold 27, equally spaced apart at their lower ends by the circular ring mold 31, Figs. 10, 11, 13, placed between them. This ring mold is provided with a concave upper surface and with a slot 32, Fig. 11, adapted to accommodate the entrance therein on occassion of flange 4, and the cover 33, Fig. 14, being first positioned upon the inner mold cement is placed between the molds to fill the entire space 34, Fig. 10. The cover 33 is then removed, and ring mold 35, Fig. 12, having a convex lower surface, is pressed between the molds upon the cement. The last-named ring mold is provided with handles 36 to enable the operator to cause it to have a rotating movement upon the upper surface of the cement, thereby settling the whole mass and equally spacing apart the upper walls of the molds. I employ varying widths of ring molds to correspond with the adjustments made of flanges 3, 4, and 5 in forming tiles of varying thickness for different uses, and this variation and the number of such flanges upon the inner wall of mold 6 may be increased as desired. After the tile has been formed it is released from the outer mold by reversing the clasps 30 and from the inner mold by reversing the lever or handles 26, first having raised clasp 23. The handles 26, shaft 12, and cones 13 and 14, as well as the links 10 and their pivotal bearings, are heavily constructed. The surfaces 8 of the brackets 7 are broadly formed, so that their degree of adherence to the brackets is sufficient to withstand the momentum from the rotation of the combined shaft and cones, and any slight inequality of surfaces upon the inner mold or lengthwise seam formed in the outer wall 2 of the inner mold by flange 3 which might operate to cause slightly-uneven surfaces upon the inner wall of the cement tile will form no substantial obstruction to the rotating movement of the parts, but will be readily overcome by the momentum of the heavier parts while driving the handle revolubly, as found by experience, and it is found that the sheet-iron or other metal having an attenuation similar thereto is entirely adequate for forming large tiles and is effectively controlled by the mechanism employed.

Various minor details of construction may be varied without departing from the scope of the invention, as is obvious.

What I claim as my invention is—

1. Mold-forming mechanism, in combination, comprising an inner mold 6 and an outer mold 27; said inner mold having a central rotatable shaft 12, and rigidly-mounted brackets 7 mounted upon the inner wall 1 of said mold; the plate 16 rigidly mounted upon said shaft; the links 10 pivotally mounted upon said brackets 7 and upon said plate 16; the flanges 3 and 4 adapted to make engagement one with the other; the clasp 23 adapted to make engagement with eyes 24; the handles 26; the cover 33; the rim-molds 31 and 35; said outer mold having the flanges 28 and 29 and clasps 30 substantially as shown and described.

2. Mold-forming mechanism, in combination, comprising an inner mold 6 and an outer mold 27; said inner mold having a central rotatable shaft 12, and rigidly-mounted

brackets 7 mounted upon the inner wall 1 of said mold; said brackets being formed of integral and substantially rectangular sheets of metal incised substantially upon the lines *f g* to form leaves 11 adapted to be used as pivotal bearings for said rods 22; the plate 16 rigidly mounted upon said shaft; the links 10 pivotally mounted upon leaves 11 of brackets 7, the opposite end of said links being pivotally mounted upon said plate 16; the flanges 3 and 4 adapted to make engagement one with the other; the flange 5 adapted to make engagement with flange 3; the clasp 23 adapted to make engagement with eyes 24; the handles 26; the cover 33; said rim-mold 31 having the slot 32; said outer mold having the flanges 28 and 29 and clasps 30, substantially as shown and described.

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

GEORGE HENNINGSEN.

Witnesses:

T. G. JENSEN,

J. J. ESBECH.