No. 860,144. PATENTED JULY 16, 1907.

A. P. MELTON.

CORE OR INNER CASING FOR CONCRETE PIPE MOLDS.

APPLICATION FILED SEPT. 16, 1905.

Fig. 3.

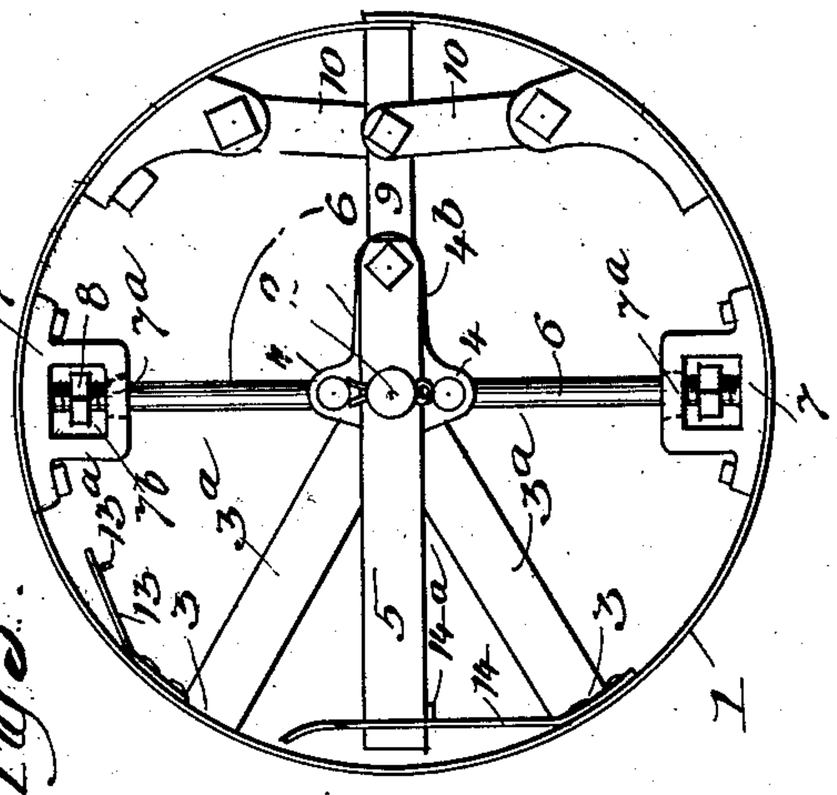


Fig. 2.

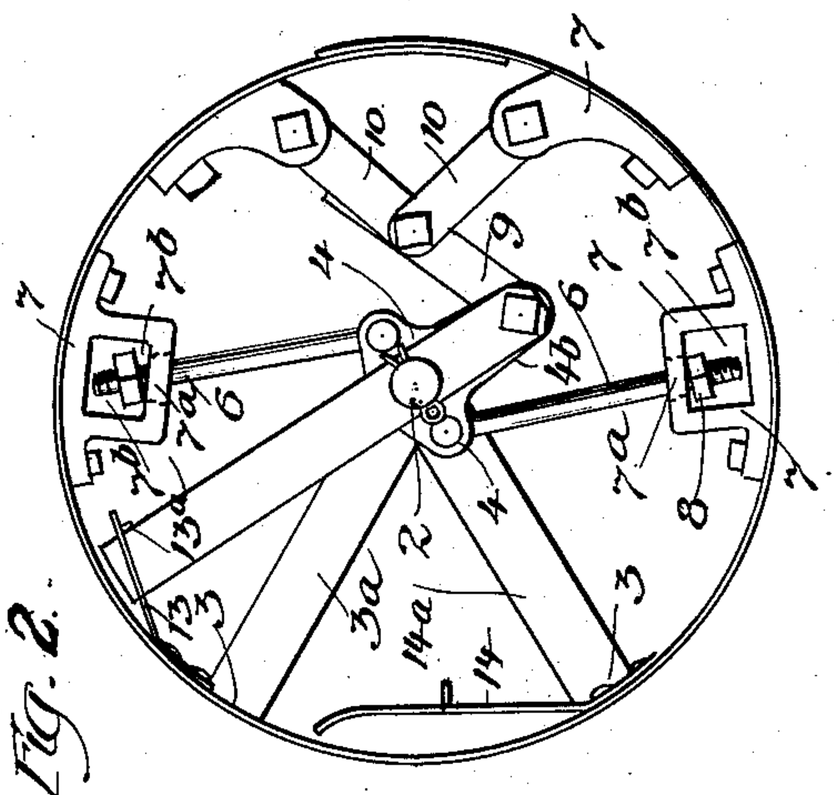
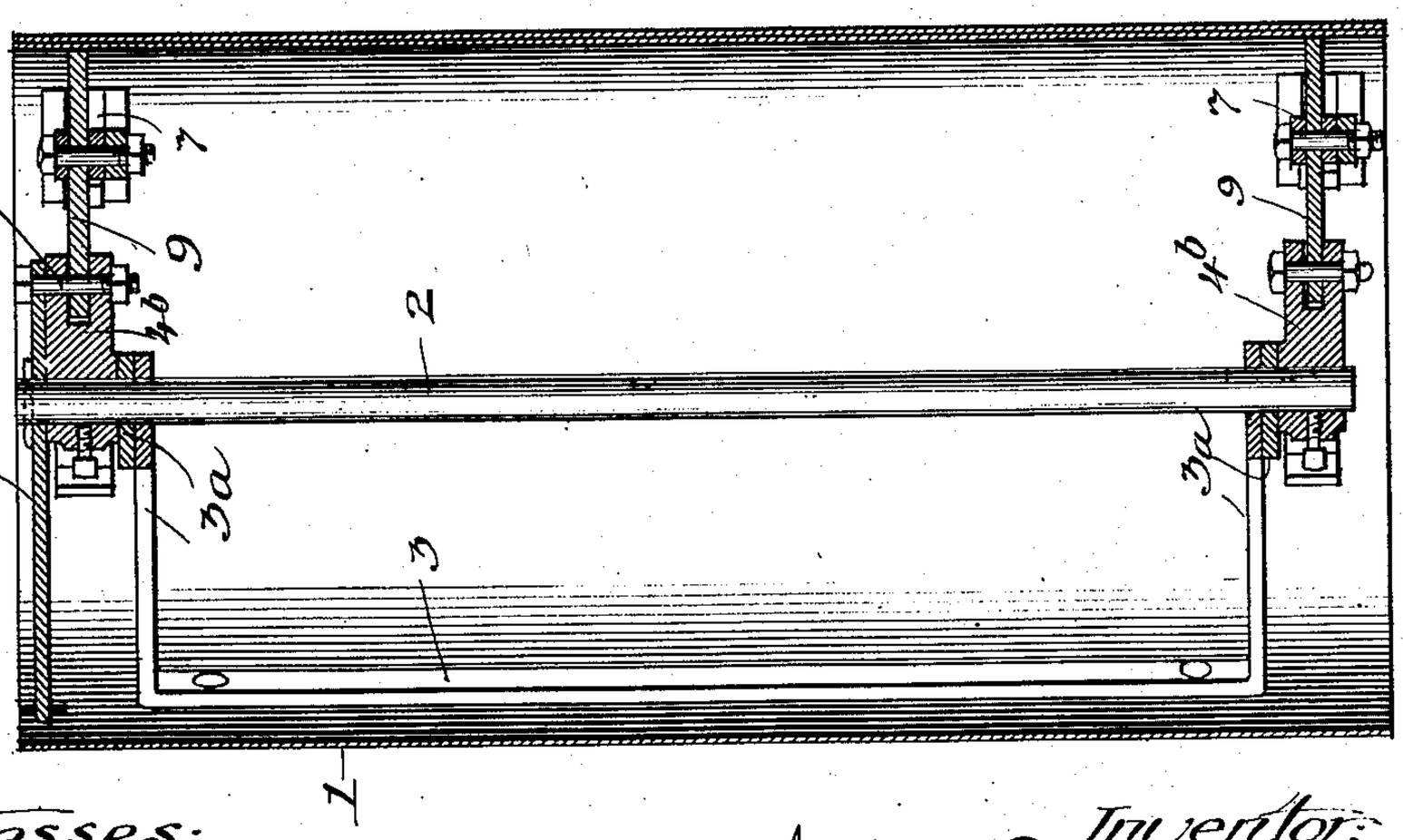


Fig. 1.



Witnesses:
Frank S. Blanchard.
J. S. Abbott

Inventor:
Arthur P. Melton
By Burton & Burton
Attorneys.

UNITED STATES PATENT OFFICE.

ARTHUR P. MELTON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO MIRACLE PRESSED STONE COMPANY, OF SIOUX FALLS, SOUTH DAKOTA, A CORPORATION OF SOUTH DAKOTA.

CORE OR INNER CASING FOR CONCRETE-PIPE MOLDS.

No. 860,144. Specification of Letters Patent. Patented July 16, 1907.

Application filed September 15, 1905. Serial No. 278,556.

To all whom it may concern:

Be it known that I, ARTHUR P. MELTON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented new and useful Improvements in Cores or Inner Casings for Concrete-Pipe Molds, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved collapsible inner member or casing, sometimes called the core, of a mold for making concrete pipe.

It consists of the features of construction set out in the claims.

In the drawings:—Figure 1 is an axial section of an inner mold member having mechanism embodying my invention. Fig. 2 is a top plan of the same, showing the parts at collapsed condition of the mold member. Fig. 3 is a view similar to Fig. 2, showing the parts expanded.

The core or inner mold member consists of a sheet-metal shell, 1, preferably steel, rolled to a cylindrical form, with tendency to coil or collapse cylindrically to a diameter somewhat less than that at which it is to operate in the mold, the sheet metal having sufficient contractile elasticity to permit it to be expanded to the maximum and contracted to the minimum diameter shown in Figs. 2 and 3, the edges overlapping and sliding upon each other in the change from one diameter to the other. Extending longitudinally within this cylindrical shell is a shaft, 2. For journaling this shaft substantially axially within the shell there are provided two yokes, 3, 3, extending longitudinally parallel to each other about 60 degrees apart in the circumference of the shell, and riveted fast to the shell, said yokes having at their opposite ends arms, 3^a, 3^a, the two arms of each yoke being parallel, and all the arms extending longitudinally radially with respect to the shell being folded at right angles to the longitudinal member of the yoke, so that the two arms at the corresponding ends of the yokes intersect or lap across each other at substantially the center of the shell, and the shaft, 2, extending through these lapping ends obtains journal bearings therein. Outside the yoke arms, 3^a, at both ends, there are, rigid with the shaft, 2, lever plates, 4, 4. At diametrically opposite points on the lever plates, 4, there are connected to each of them two thrust-arms or links, 6, and to the inner side of the shell, at corresponding diametrically opposite points there are riveted clips, 7, 7, having each a radial aperture, 7^a, through which the thrust arms or links, 6, enter, and having in addition the aperture, 7^b, to accommodate a nut, 8, on the end of the arm, 6, which is threaded to receive it. The thrust arm, 6, impinges at the end against the back of the clip when the shaft, 2, is rocked to position for bringing the pivotal connections of the links or thrust arms with the lever plate, in line diametrically with the guide apertures, 7^a, through which the links extend into the clips; and it will be noticed that thus rocking the shaft and thereby causing the two thrust arms to extend in a straight line, spreads the shell to a maximum diameter at that line. The nuts, 8, may be adjusted on the threaded end of the thrust arms or links to allow any desired amount of play between the point at which the nut will collide with the inner side of the aperture and the point at which the end of the thrust arm collides with the outer side thereof. Beside the two lugs or short lever arms, 4, at which the thrust arms or links, 6, are pivotally connected to the lever plate, said plate has a longer lever arm, 4^b, at right angles to the line at which the other two lugs or short arms are oppositely extended; and to this longer arm there is connected a link or thrust arm, 9. The length from the end of this thrust arm to the axis of the shaft, 2, when the thrust arm is extended in the direction of the arm, 4^b, of the lever plate, is the maximum radius of the shell when expanded to the full extent caused by rocking the shaft to set the two thrust arms, 6, 6, in line, as shown in Fig. 3; and said arm or link, 9, thereby holds the shell out to the proper full diameter at a point intermediate and 90 degrees around from the opposite ends of the thrust arms, 6, 6, when the shell is thus extended.

To control the thrust arm, 9, and for a further purpose, it is connected intermediate its ends by links, 10, 10, with two clips, 11, 11, riveted to the shell at equal distances from the lapping edges, the proportions of the parts and distances between the several pivotal connections being such that the said links, 10, 10, are nearly in a straight line when the thrust arm, 9, is in line with the lever arm, 4^b, as seen in Fig. 3. From this connection of the parts it results that the rocking of the shaft from the collapsed position shown in Fig. 2, to swing the lever plate around to the position shown in Fig. 3, diametrically expands the shell by thrusting it outward at three points,—to wit, the diametrically opposite ends of the thrust bars, 6, 6, and the end of the thrust bar, 9. At the same time the same result is assisted by the thrusting action of the links, 10, 10, drawing the lapped ends in opposite directions, causing them to slide upon each other to diminish the lap.

It will be noticed also that at the expanded position of the parts shown in Fig. 3 the elastic reaction of the

shell tending to collapse it, is resisted in radial lines, which makes the resistance effectual to prevent a collapse, the parts being thus substantially locked at the position of greatest expansion. For rocking the shaft to expand and collapse the shell, it is provided with a lever arm, 5, which is required at only one end. This arm is conveniently made rigid with the shaft by being connected both to the shaft itself and to the pivot bolt, 4^c, which connects the thrust arm or link, 9, to the lever arm, 4^b, of the lever plate. For stopping the lever arm, 5, at proper limits in its movement for collapsing and expanding the shell, there are preferably provided spring arms, 13 and 14, riveted at the inner side of the shell, having each a stop finger, 13^a and 14^a, respectively, against which the lever arm, 5, strikes when it is swung in the two directions respectively.

It will be understood that the shell is collapsed after the mold has been filled and tamped, completing the molding process, and that at this time the pressure will have caused the two lapping edges of the shell to be very firmly held in contact, and it will be seen that there would actually be very severe friction caused by any movement for sliding these edges upon each other in the collapsing process. In order to diminish this friction and prevent it from causing a tendency to buckle the shell at any point in the collapsing movement, the stop springs, 13 and 14, are placed so as to determine the range of movement of the lever arm, 5, at that side of the diametric line at which it stands when the mold is fully expanded which corresponds to the inner lapped edge,—that is, so that the lever arm, 4^b, of the lever plate will swing toward the outer lapped side in collapsing the mold. This will cause the pull of the link or thrust rod, 9, on the two links, 10, 10, to differ in favor of the link connected with the inner lapped edge that is, with a tendency to pull the inner lapped edge a little more directly and therefore a little earlier, thus drawing it inward from the outer lapped edge and relieving the friction. This effect can be most clearly understood by considering the final collapsed position of the parts shown in Fig. 2, at which stage the advantage of directness of pull on the link, 10, connected with the inner lapped edge, as compared with its pull upon the other link, 10, will be obvious from the relative direction of the two links with respect to the link, 9.

It will be understood that in order that the shell may be perfectly cylindrical when expanded it will be curved to the maximum diameter between the points at which the yokes, 3, 3, are secured to it, since the action of the rock shaft and connections journaled in these yokes will have no tendency to effect the curvature over that portion of its circumference.

I claim:—

1. An inner member or core for a pipe mold comprising a slightly flexible shell of plate rolled into cylindrical form with its edge portions lapping; a shaft extending axially within such shell; journal bearings for such shaft projected rigidly inwardly from the side of the shell opposite the lapped edges; lever plates on the shaft; thrust arms or links connected to the lever plates and adapted to be thrust in opposite directions against the shell, and guides for their ends mounted on the shell at such opposite positions.

2. An inner member or core for a pipe mold comprising a slightly flexible shell of plate rolled into cylindrical form with its edge portions lapping; a shaft extending axially into the shell; journal bearings for such shaft projecting rigidly inwardly from the side of the shell opposite the lapped portion; a lever arm projecting from the rock shaft near each end of the latter and links connected to the lever arms respectively, which, when extended in line with the respective lever arms, thrust endwise against the shell at the lapped portion.

3. An inner member or core for a pipe mold comprising a flexible shell of plate rolled into cylindrical form; a shaft extending axially within the shell; journal bearings for such shaft projected rigidly inwardly from the side of the shell opposite the edges of the roll plate; lever arms projecting from the shaft; links connected to said lever arms respectively, which, when extended in line with the arms, thrust their ends against the shell at said edge portion.

4. An inner member or core for a pipe mold, comprising a flexible shell of plate rolled into cylindrical form; a shaft extending axially within the shell; journal bearings for such shaft projected inwardly from the side of the shell opposite the edges of the rolled plate; lever arms projecting from the shaft; links connected to said lever arms respectively, which, when extended in line with the arms, thrust their ends against the shell at said edge portions, and links pivotally connecting each of said first-mentioned links with the shell at a distance back from said edges respectively.

5. An inner member or core for a pipe mold, comprising a flexible shell of plate rolled into cylindrical form with its edges free to move relatively; a shaft extending axially within such shell; journal bearings for such shaft projected inwardly from the side of such shell opposite said edges; lever plates on the shaft having three lever projections, two of which are diametrically opposite and the third substantially at right angles to the line connecting the first two; thrust arms or links from the first two lever projections of the plate extending to opposite sides of the shell and having guides thereon; a third link pivoted to the third arm and adapted when extended to thrust against the shell at the edge portions, and means for guiding said third link into line with the arm to which it is pivoted when the other two links are in line with each other.

6. An inner member or core for a pipe mold, comprising a flexible shell of plate rolled into cylindrical form with its edges free to move relatively; a shaft extending axially within such shell; journal bearings for such shaft projected inwardly from the side of such shell opposite said edges; lever plates on the shaft having three lever projections, two of which are diametrically opposite and the third substantially at right angles to the line connecting the first two; thrust arms or links from the first two lever projections of the plate extending to opposite sides of the shell and having guides thereon; a third link pivoted to the third arm and adapted when extended to thrust against the shell at the edge portions; two links pivoted to each of said third links and extended in opposite directions therefrom and pivotally connected at their remote ends with the shell at opposite sides of the point at which said third link thrusts against the shell.

7. An inner member or core for a pipe mold, comprising a flexible shell of plate rolled into cylindrical form; a shaft extending axially within the shell; two yokes or backets extending longitudinally along the inner side of the shell, secured thereto, and having each at their ends parallel arms projecting substantially radially with respect to the shell, the corresponding arms at each end of the two yokes lapping by each other at the center and affording journal bearings for the shaft; lever plates secured to the shaft and links from said lever plates adapted to thrust radially against the shell for expanding it, and means for guiding the links.

8. An inner member or core for a pipe mold comprising a flexible shell of plate rolled into cylindrical form, with its edges lapped; a shaft extending axially within the shell; journal bearings for such shaft projected inwardly from the side of the shell opposite said edges; lever arms projecting from the shaft in the same axial plane at a distance apart in the length of the shaft; links connected to said lever arms respectively adapted when extended in the direction of the respective lever arms to thrust against the shell at the lapped portion; links in pairs pivoted to

said first-mentioned links respectively, two of each pair extending in opposite directions therefrom and pivotally connected at their remote ends with the shell at opposite sides of the point at which said first-mentioned link thrusts thereagainst; means for rocking the shaft in its bearings and for stopping it at one limit, with the first-mentioned lever arms and the links pivoted thereto respectively extended in line with each other, the edge of the shell connected with the links which extend toward the side away from which said lever arm swings when the shaft is rocked toward the other limit being lapped inside the other edge.

9. An inner member or core for a pipe mold comprising a flexible shell of plate rolled into cylindrical form, with its edges free to move relatively; a shaft extending longitudinally within the shell; journal bearings for such shaft projected rigidly inwardly from the side of the shell opposite the edges of the rolled plate; transversely diverging lever arms projecting from the shaft; links connected to said lever arms respectively extending outwardly toward the shell; guides mounted on the shell for the free ends of the respective links, and means for rocking the shaft to thrust the links outward to the shell to expand the latter.

10. An inner member or core for a pipe mold comprising a flexible shell of plate rolled into cylindrical form with its edges free to move relatively; a shaft extending longitudinally in the shell; journal bearings for such shaft projected inwardly from the side of the shell opposite said edges, the shaft having oppositely extending lever arms; links connected to said arms respectively; guides for the free ends of the links mounted on the shell at opposite positions, said free ends being threaded and extended through said guides for thrusting against the shell to expand it, and nuts adjustable on said threaded ends beyond the guides for engaging the latter when the links are retracted to contract the shell.

In testimony whereof, I have hereunto set my hand, in the presence of two witnesses, at Minneapolis, Minnesota, this 8th day of Sept., 1905.

ARTHUR P. MELTON.

In the presence of—
ALBERT S. WEMPLE,
JNO. O. PARRY.