April 7, 1942. W. S. MYERS 2,278,555

CENTRIFUGAL CASTING APPARATUS

Filed July 26, 1941 2 Sheets-Sheet 1

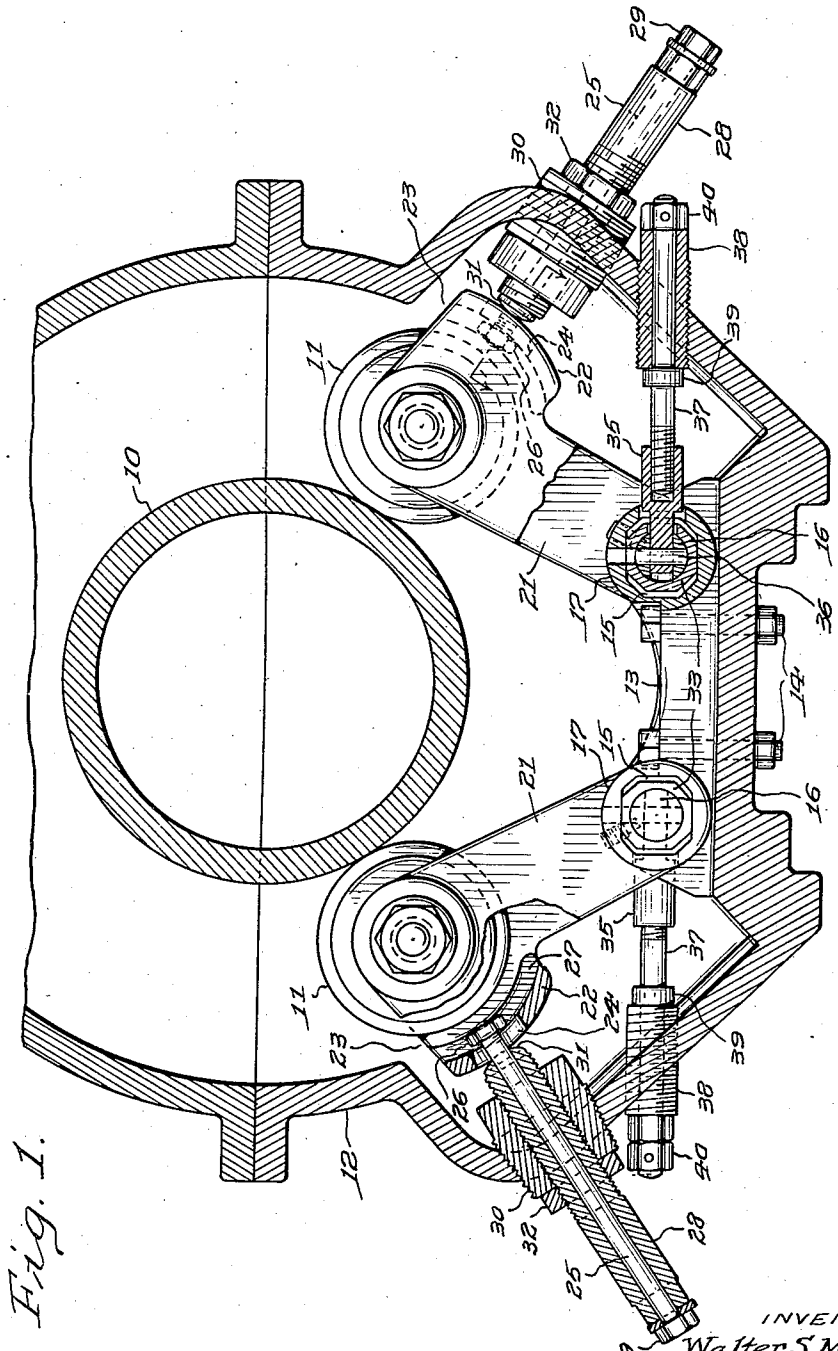


Fig. 1.

INVENTOR
Walter S. Myers.
BY John D. Myers
ATTORNEY

WITNESS
F. J. Hartman.

April 7, 1942. W. S. MYERS 2,278,555

CENTRIFUGAL CASTING APPARATUS

Filed July 26, 1941 2 Sheets-Sheet 2

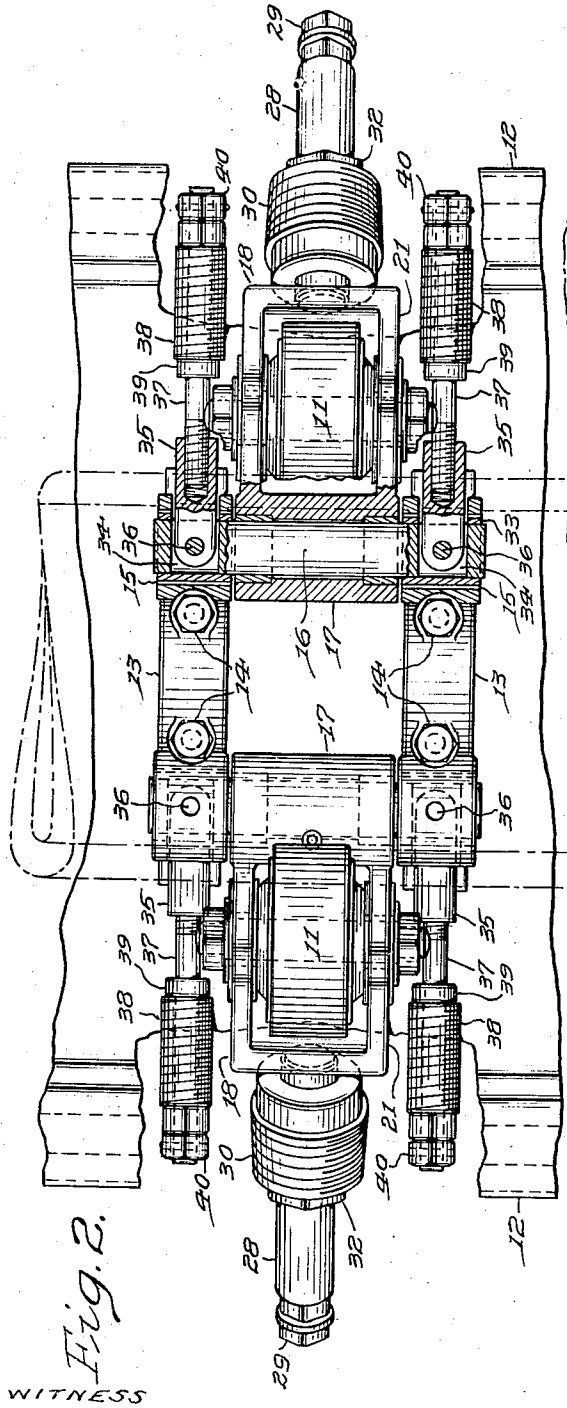


Fig. 2.

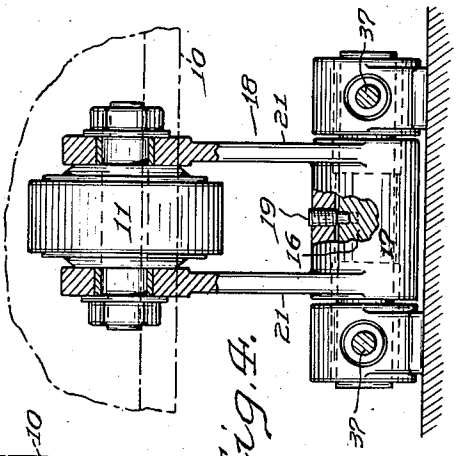


Fig. 4.

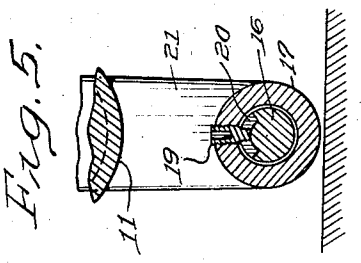


Fig. 5.

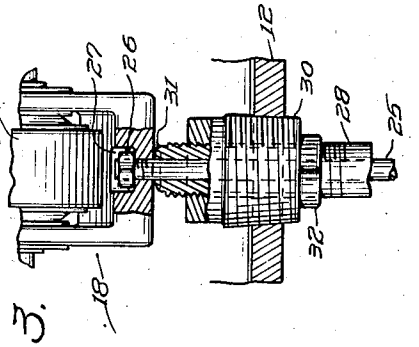


Fig. 3.

WITNESS
F. J. Hartman.

INVENTOR
Walter S. Myers.
BY John D. Myers
ATTORNEY

Patented Apr. 7, 1942

2,278,555

UNITED STATES PATENT OFFICE

2,278,555

CENTRIFUGAL CASTING APPARATUS

Walter S. Myers, North Merchantville, N. J., assignor to United States Pipe and Foundry Company, a corporation of New Jersey

Application July 26, 1941, Serial No. 404,171

10 Claims. (Cl. 22—65)

The invention relates to centrifugal casting apparatus and is directed specifically to an improvement in means for adjusting the rollers which support the rotary mold in the water box of such apparatus.

In centrifugal casting apparatus employed for casting pipe and the like, rollers are commonly utilized in the water box of such apparatus, with their faces in contact with the outer surface of the mold for supporting it in its rotational movement. It is also well known in such apparatus to have means for adjusting the rollers toward and away from the center line of the water box for the purpose of fixing the position in the water box in which it is desired to have the mold rotate. In some of the apparatus heretofore used the adjusting means for the mold-supporting rollers is not accessible outside the water box, and it is necessary to remove the top of the water box in order that adjustments of the rollers may be effected. In other known apparatus, certain adjustments of the rollers are possible from the outside of the water box, but all desired adjustments can not be effected. Irrespective of the particular means heretofore employed for adjusting the mold-supporting rollers bodily toward and away from the axis or center line of the water box, the surfaces of the rollers, when finally adjusted, are frequently out of alignment with the outer surface of the mold, and no satisfactory way has been provided heretofore for aligning the surfaces of the rollers with respect to the outer surface of the mold, or for varying this alignment where it is desired to so cant the rollers as to provide an end thrust upon the mold.

One of the primary objects of the present invention is the provision, in centrifugal casting apparatus, of novel means for supporting the mold-carrying rollers, and for aligning the surfaces of the rollers with respect to the outer surface of the mold, or for varying such alignment. A further object of the invention is the provision of roller-adjusting means which may be employed for providing an end thrust upon the mold, or for varying the end thrust as desired. A still further object of the invention is the provision of means which is operable from the exterior of the water box for aligning the surfaces of the mold-supporting rollers with respect to the outer surface of the mold, or for varying such alignment. Still further objects and advantages of the improvement will be apparent from the following specification, taken with the accompanying drawings wherein:

Fig. 1 is a transverse sectional view through the water box and mold of centrifugal casting apparatus, showing my improved roller supporting and adjusting mechanism incorporated therein;

Fig. 2 is a plan view, partly in section, showing one set of roller supporting and adjusting means, the water box being partly cut away and the mold being shown in dotted lines;

Fig. 3 is a plan view, partly in section, showing details of the locking means for holding the rollers in various positions of adjustment toward and away from the axis of the water box;

Fig. 4 is a side elevational view, partly in section, showing the manner in which the roller frame is supported upon its bearing pin; and

Fig. 5 is a view similar in part to that shown in Fig. 4, but taken at right angles thereto.

As illustrated in the drawings, the improvement is disclosed in connection with a mold 10 which is mounted for rotation on rollers 11 in a water box 12, the apparatus being of a type which is commonly used in centrifugally casting pipe and other tubular bodies. It will be understood that the rollers 11 and the supporting and adjusting means therefor, as described herein, are employed in sets of two, arranged in the water box longitudinally of the mold 10, and that any number of sets may be used as desired, although two sets will be sufficient in most cases. It will be understood further that the present improvement may be utilized in connection with a single roller where the use of the improved roller supporting and adjusting means with a single roller is desired. Inasmuch as the construction of the supporting and adjusting means for all the rollers is the same, a description of one will suffice for all.

The rollers 11 may be supported upon bearing blocks 13 arranged in pairs as shown in Fig. 2, these blocks being secured in the bottom of the water box 12 by means of bolts 14 passing through the blocks and the wall of the water box. The ends of bearing blocks 13 are provided with aligned openings 15 to receive the ends of a bearing pin 16 which extends through a bearing sleeve 17 and serves as a bearing for a roller frame 18 with which the sleeve 17 is integrally formed. A screw 19 threaded through the sleeve 17, with its inner end terminating in a slot 20 in bearing pin 16, permits limited swinging movement of frame 18 about pin 16, but prevents endwise movement of sleeve 17 on bearing pin 16.

The roller frame 18 comprises two side plates 21 in the upper ends of which the roller 11 is suitably mounted, it being understood that the parts

are so arranged as to position the face of the roller 11 in contact with the outer surface of mold 10. A cross member 22, extending between angular projections 23 on the side plates 21, is provided with a slot 24 to receive a locking bolt 25, the inner end of which is threaded to receive a nut 26 in a channel 27 on the inner face of the cross member 22.

The locking bolt 25 extends outwardly through an opening in an adjusting pin 28 and is provided on its outer end with a head 29 by means of which it may be manipulated by the use of a suitable tool. The adjusting pin 28 is threaded through a sleeve 30 secured in the wall of the water box. The inner end of pin 28 is rounded, as shown at 31, for engagement with the arcuate outer surface of cross member 22, and its outer end may be so formed as to receive a suitable manipulating tool. A nut 32 threaded on the adjusting pin 28 may be utilized for locking the pin 28 in its various positions of adjustment in sleeve 30.

As will be apparent from the structure just described, when the locking bolt 25 is turned in a direction to loosen the nut 26, the roller frame 18 is free to move around the bearing pin 16. Turning the adjusting pin 28 in one direction will then operate to move the roller 11 inwardly toward the axis of the water box 12, while turning the adjusting pin 28 in the opposite direction will permit the roller 11 to move outwardly and downwardly away from the axis of the water box. It will also be apparent that the adjusting pins 28 may be used to center the mold 10 in the water box 12 or to vary its position therein, within limits, as may be desired. It will also be apparent that when the desired adjustments of the rollers 11 toward or away from the axis of the water box are effected by means of the adjusting pins 28, the adjusting pins 28 may be retained in their adjusted positions by tightening the locking nuts 32, and the frames may be secured against movement around bearing pins 16 by the locking bolts 25.

In order to provide a roller support which will permit the alignment of the surface of each roller to be varied with respect to the surface of the mold 10, the opposite ends of the bearing pin 16 are so mounted in the aligned openings 15 in the bearing blocks 13 as to permit independent adjustment of the ends of bearing pin 16 to thereby move the bearing pin into various positions of alignment transversely of the axis of the water box. As disclosed herein, each end of bearing pin 16 is mounted in a bushing 33 which is slidably supported in opening 15. As illustrated in Fig. 1 of the drawings, the fit of bushings 33 in the openings 15 is such as to provide movement of these bushings back and forth substantially in a direction parallel with and transversely of the bottom wall of the water box 12.

Each end of bearing pin 16 is provided with a transverse opening 34 to receive the reduced inner end of a coupling member 35 extending outwardly through aligned openings in bushing 33 and bearing block 13. The inner end of coupling member 35 is secured to bearing pin 16 by a pivot pin 36, and the outer end of the coupling member is internally threaded to receive the threaded inner end of an adjusting bolt 37. The adjusting bolt 37 extends outwardly through an opening in a sleeve 38 threaded in the wall of the water box 12. Adjusting bolt 37 is provided with a thrust collar 39 for engagement with the inner end of sleeve 38, while a nut 40 secured thereon in contact with the outer end of sleeve 38 serves as means by which it may be turned.

From the structure just described, it will be apparent that when the adjusting bolt 37 is turned in one direction or the other by the application of suitable manipulating means to the nut 40, the threaded construction of the inner end of the bolt 37 in the coupling member 35 will operate to slide the bushing 33 in the bearing block to thereby vary the alignment of bearing pin 16 and the axis of roller 11 with respect to the axis of the water box 12, or the mold 10 supported therein. The ends of sleeve 17 are sufficiently spaced from bearing blocks 13 to permit such movement of pin 16 and bushings 33. This adjusting means may therefore be employed for aligning the surfaces of rollers 11 with respect to the surface of the mold 10 after the desired adjustment of the various rollers toward and away from the axis of the water box has been effected. It will also be apparent that the adjustment effected through the adjusting bolts 37 may be employed for canting rollers 11, or varying their alignment with respect to the mold, to thereby provide an end thrust for the mold in one direction or the other as may be desired.

As will be apparent from the above description and the accompanying drawings, the improvement provides means operable from the outside of the water box to adjust the mold supporting rollers bodily for the purpose of fixing the rotative position of the mold, and also provides means operable from the outside of the water box for varying the alignment of the surfaces of the rollers with respect to the surface of the mold. While a preferred form of apparatus has been disclosed herein, together with a certain arrangement of the parts thereof, it is to be understood that the invention is not intended to be limited to the precise apparatus and arrangement of parts disclosed. The above description and the accompanying drawings are therefore to be regarded as illustrative only, and it is to be understood that the invention is susceptible of other forms and arrangements so long as they come within the scope of the appended claims.

What I desire to claim is:

1. In apparatus for supporting a centrifugal pipe mold and comprising a roller frame having a pivotal mounting at one end and having its other end adjustable to move a mold-supporting roller thereon about the axis of the pivot of the pivotal mounting, the improvement which comprises adjustable bearings for the opposite ends of said pivotal mounting, and means for adjusting said bearings to vary the alignment of said roller with respect to said mold.

2. In apparatus for supporting a centrifugal pipe mold and comprising a roller frame having a pivotal mounting at one end and having its other end adjustable to move a mold-supporting roller thereon about the axis of the pivot of the pivotal mounting, the improvement which comprises an adjustable bearing for said pivotal mounting, and means for adjusting said bearing to vary the alignment of said roller with respect to said mold.

3. In centrifugal casting apparatus having a cylindrical mold mounted in a water box and rotatably supported upon rollers in the water box, the improvement which comprises means for supporting each roller with its axis generally parallel to the axis of said water box, adjusting means for moving said roller toward and away from the axis of said water box, and ad-

justing means for varying the alignment of the axis of said roller with respect to the axis of said water box.

4. In centrifugal casting apparatus having a cylindrical mold mounted in a water box and rotatably supported upon rollers in the water box, the improvement which comprises means for supporting each roller with its axis generally parallel to the axis of said water box, adjusting means operable from the exterior of said water box for moving said roller toward and away from the axis of said water box, and adjusting means operable from the exterior of said water box for varying the alignment of the axis of said roller with respect to the axis of said water box.

5. In centrifugal casting apparatus having a cylindrical mold mounted in a water box and rotatably supported upon rollers in the water box, the improvement which comprises means for supporting each roller with its axis generally parallel to the axis of said water box, and adjusting means operable from the exterior of said water box for moving said roller toward and away from the axis of said water box and for varying the alignment of the axis of said roller with respect to the axis of said water box.

6. In apparatus for supporting a centrifugal mold, a pair of spaced bearing blocks, a bearing pin having its opposite ends mounted in said blocks for adjustment of each end transversely of the direction of the axis of said pin, a roller support mounted to swing on said pin, a roller carried by said support, adjusting means for swinging said support about said pin, and means connected to said pin to adjust each end thereof transversely of the direction of the axis of said pin.

7. In apparatus for supporting a centrifugal mold in a water box, a pair of spaced bearing blocks in said water box, a bearing pin mounted in said blocks for adjustment transversely of the direction of the axis of said pin, a roller support mounted to swing on said pin, a roller carried by said support, means operable from the exterior of said water box for adjusting said roller support about said pin, and means operable from the exterior of said water box and connected to the ends of said pin to adjust said ends transversely of the direction of the axis of said pin.

8. In centrifugal casting apparatus having a cylindrical mold mounted in a water box and rotatably supported upon rollers in the water box, the improvement which comprises a pair of bearing blocks in said water box and spaced from each other longitudinally of the axis of said mold, a bearing pin mounted in said blocks for movement transversely of said axis, a roller frame mounted on said bearing pin for swinging movement about said pin and having a mold supporting roller thereon, adjusting means operable from the exterior of said water box for swinging said frame about said pin, and adjusting means operable from the exterior of said water box for moving each end of said pin transversely of the axis of said mold.

9. In centrifugal casting apparatus having a cylindrical mold mounted in a water box and rotatably supported upon rollers in the water box, the improvement which comprises a bearing pin mounted in said water box for independent movement of its ends transversely of the axis of said mold, a roller frame mounted on said bearing pin for movement about the axis of said pin, a mold supporting roller on said frame, adjusting means operable from the exterior of said water box for moving said frame about the axis of said bearing pin, and adjusting means operable from the exterior of said water box for independently moving the ends of said bearing pin transversely of the axis of said mold.

10. In apparatus for adjusting a mold supporting roller in a centrifugal casting machine, a pair of spaced bearing blocks having aligned bearing openings therein and an opening in the side of each, a bushing mounted in the bearing opening in each block for sliding movement transversely of the axis of the bearing openings in the blocks and having an opening in alignment with the opening in the side of the block, a pin having its opposite ends supported in said bushings and having transverse openings therein in alignment with the openings in said bushings and the side of said blocks, coupling members extending through the aligned openings of said blocks and said bushings and pivotally connected in the openings in said pin, a roller supported by said pin, and means connected to said coupling members for adjusting said bushings and thereby varying the alignment of said roller with respect to the mold.

WALTER S. MYERS.