Nov. 19, 1929. J. E. HURST ET AL 1,735,969

CENTRIFUGAL MACHINE FOR CASTING METAL PIPES AND THE LIKE

Filed Dec. 3, 1928 2 Sheets-Sheet 1

FIG. 1.

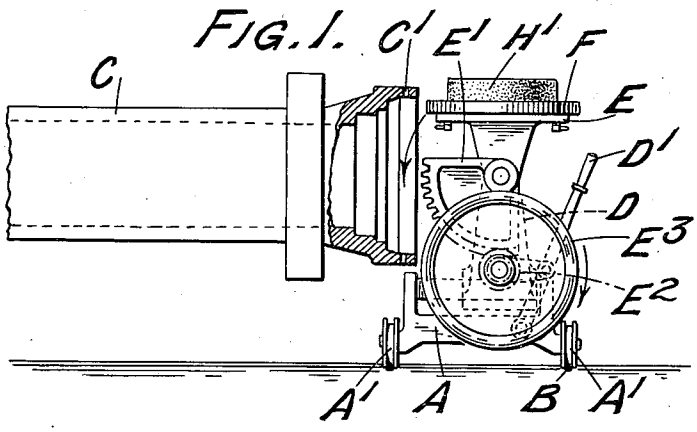


FIG. 2.

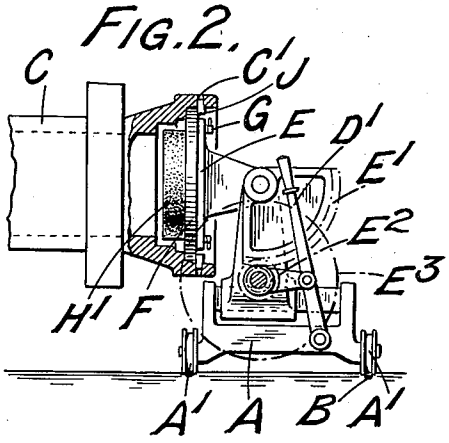
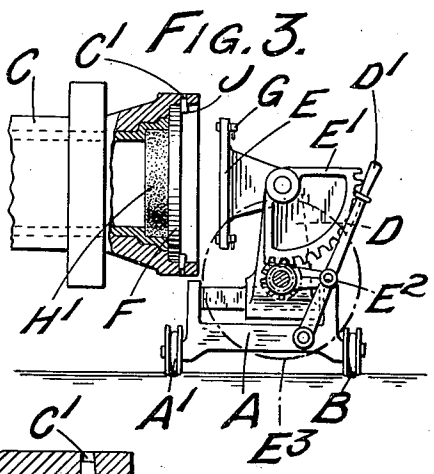


FIG. 3.



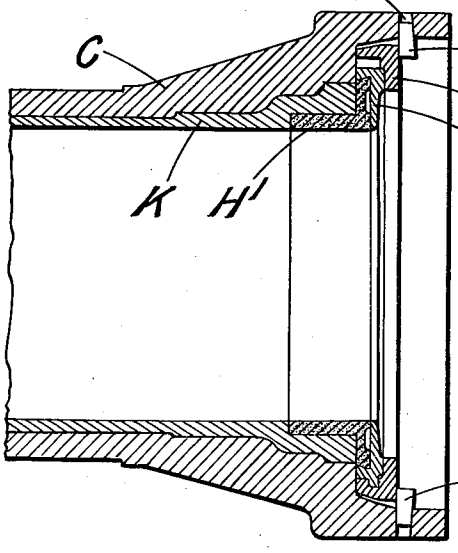


FIG. 4.

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FIG. 5.

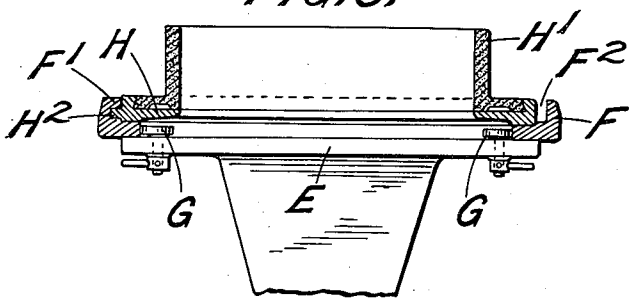


FIG. 6.

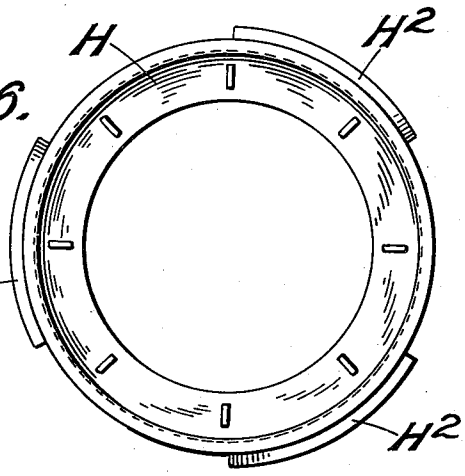
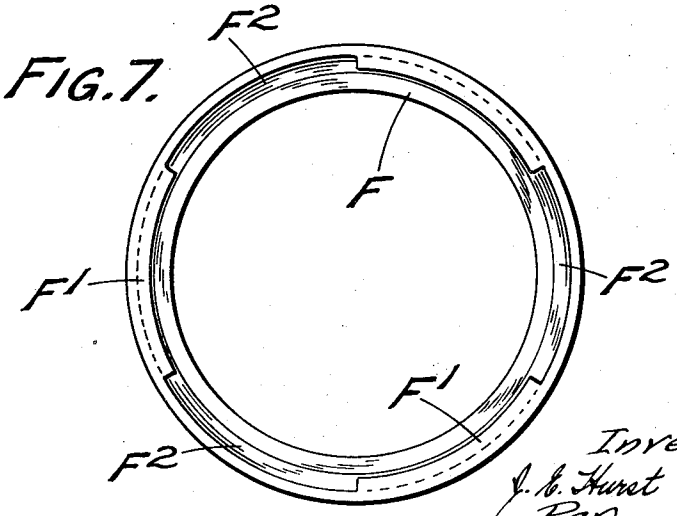


FIG. 7.



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Patented Nov. 19, 1929 1,735,969

UNITED STATES PATENT OFFICE

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CENTRIFUGAL MACHINE FOR CASTING METAL PIPES AND THE LIKE

Application filed December 3, 1928, Serial No. 323,464, and in Great Britain January 4, 1928.

This invention relates to apparatus for inserting socket cores in moulds employed in the centrifugal casting of pipes or the like and for removing the core rings therefrom, of the kind in which the core support can be turned about a horizontal axis in addition to being longitudinally moved towards or away from the mould.

The object of the invention is to provide a strong but simple apparatus particularly applicable to the manufacture of large diameter pipes or the like, so constructed that the core sockets can be handled without the use of a crane or other lifting appliance.

According to this invention a core ring, on which a sand core is formed, is slid on to a horizontal table carrying a detachable carrier ring to which the core ring is locked. The table is pivotally mounted on a truck or carriage which is then moved up to the mould, preferably along rails at right angles to the axis of the mould. The carrier ring is locked to the table which is then turned first about its pivot to bring the core into alignment with the mould, the table being then moved longitudinally so that the core is inserted into the mould. The carrier ring and the core it supports is then secured by keys or wedges in the socket end of the mould, and is unlocked from the table thus permitting the table to be withdrawn before the mould is rotated and the casting operation carried out. When this has been done the table, still in its vertical position, is again advanced and locked to the carrier ring, whereupon the keys or wedges are removed, the carrier and core rings withdrawn, the table returned into its horizontal position and the carriage moved back along its rails to the loading bench. Here the empty core ring (from which the sand core has been burnt off by the casting operation) is removed, leaving the carrier ring clear to receive a new core and its supporting ring, whereupon the cycle of operations is repeated.

One construction of apparatus according to this invention is illustrated somewhat diagrammatically in the accompanying drawings, in which

Figure 1 is a side elevation partly in section showing the table supporting a core ring in its horizontal position,

Figure 2 is a similar view with the table in its vertical position and the core ring inserted in the mould,

Figure 3 shows the table withdrawn and the core ring still in position,

Figure 4 is a vertical section through the socket end of the mould showing the carrier ring wedged in position.

Figure 5 is a vertical section on an enlarged scale showing the table in its horizontal position with the carrier and core rings locked thereto,

Figure 6 is a plan of the core ring illustrated in Figure 5, and

Figure 7 is a similar view of the carrier ring detached from the table.

The apparatus comprises a truck or carriage A mounted upon wheels A^1 adapted to travel upon rails B which are preferably arranged at right angles to the longitudinal axis of the rotary mould C, the socket end of which only is illustrated in the drawings.

The carriage A is provided with suitable standards D which can be moved in a longitudinal direction by means of a lever D^1 and mounted upon a horizontal pivot at the upper ends of the standards is a table E. This table is provided with a toothed quadrant E^1 meshing with a pinion E^2 controlled by a hand wheel E^3 by means of which the table can be swung from the horizontal position illustrated in Figure 1 into the vertical position shown in Figure 2.

Mounted upon the table top is a flanged carrier ring F which can be locked to the table in any suitable manner, as for example by means of rotatable cam-shaped locking devices G. The carrier ring is adapted to receive the metal core ring H upon which the sand core H^1 is built, and the core ring is furnished with projecting lugs H^2 which engage beneath overhanging flanges F^1 of the carrier ring when the core and carrier rings are rotated relatively to one another, there being thus a bayonet joint between the core and carrier rings.

In practice the core rings, with the sand cores which they support, are stacked upon

a loading bench of approximately the same height as the table in its horizontal position. The carriage is moved along its rails so that the table is approximately flush with the loading bench, thus enabling a core ring and the sand core built upon it to be slid from the bench on to the table. The lugs H^2 on the core ring are made to register with the cut-away portions F^2 of the carrier ring, whereupon the core ring is partially rotated so as to lock the core and carrier rings together. The carriage is then moved along its rails into the position shown in Figure 1, whereupon the hand wheel E^3 is operated to swing the table about its horizontal pivot into the position shown in Figure 3 but with the carrier ring locked thereto by means of the cam or like locking devices G. The lever D^1 is then actuated so as to move the table forward into the socket end of the mould C, i. e. into the position shown in Figure 2. Keys or wedges J are then driven into suitable openings C^1 formed in the mould, the locking devices G are released, and the lever D^1 is again actuated so as to withdraw the table into the position shown in Figure 3. The casting operation is then carried out, the core H^1 forming the socket on the end of the pipe which is indicated at K in Figure 4. When the casting is sufficiently set the table is returned from the position shown in Figure 3 to that shown in Figure 2 by actuating the lever D^1, the carrier ring is locked to the table by the clamping devices G, the wedges J are knocked out, the table is turned back into its horizontal position by means of the hand wheel E^3, and the carriage is wheeled back to the loading bench. In the process of casting, the oil or other liquid by which the sand core was bound together is burnt out so that the core collapses and only the core ring is withdrawn. On reaching the loading bench the core ring is removed by being rotated within the carrier ring and is replaced by a new core ring carrying a sand core H^1, whereupon the cycle of operations is completed.

A core inserting and removing apparatus as above described has few moving parts and can readily be operated by hand even in the case of large diameter pipes since the height of the table in its horizontal position is approximately flush with that of the bench upon which the cores are stacked enabling them to be readily slid into position and given the half turn in order that they may be locked to the carrier and table on which the latter is mounted.

In some cases a circular track may be arranged so that several carriages can be passed in succession across the end of the mould and returned to the core filling station or two or more carriages may be employed, separate tracks leading into the single track which crosses the end of the mould.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In apparatus for introducing a core carrier and an associated core into a mould, the combination with a support, of a table adapted to retain a core carrier and core thereon, said table being mounted on said support for rotation from a substantially horizontal position to a position facing the mould, and means for shifting said table bodily with relation to said support to insert the core carrier and core in the mould.

2. In apparatus for introducing a core carrier and core into the mould of a centrifugal casting machine, the combination with a support, of a table pivotally mounted on said support for movement from a substantially horizontal position to a position facing the mould, means for locking a core carrier and core on said table, means for displacing the said table on the said support axially of the mould for inserting the core carrier and core into the mould.

3. In apparatus for introducing a core carrier and core into the mould of a centrifugal casting machine, the combination with a support, of a table mounted on said support for rotational movement from a horizontal position to a position facing the mould and for bodily movement axially of the mould, and means extending through the said table for locking a core carrier and core to the latter.

4. In apparatus for introducing a core carrier and core into the mould of a centrifugal casting machine, the combination with a support, of a table mounted on said support for rotational movement from a horizontal position to a position facing the mould and for bodily movement axially of the mould, and means extending through the said table for locking a core carrier and core to the latter, said means comprising a plurality of rotatable spindles spaced about said table and provided with eccentric core carrier engaging means on one side and actuating means on the other side of the table.

5. In apparatus for introducing a core carrier and core into the mould of a centrifugal casting machine, the combination with a support, of a table pivotally mounted on said support for movement from a substantially horizontal position to a position facing the mould, means for locking a core carrier and core on said table, means for displacing the said table on the said support axially of the mould for inserting the core carrier and core into the mould, and means for mounting said support for movement transversely of the axis of the mould.

In testimony whereof we have signed our names to this specification.

JAMES EDGAR HURST.
EDMUND BRUCE BALL.