Sept. 30, 1924. 1,510,220

B. HEFFER

CONCRETE PIPE MAKING MACHINE

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Fig. 1

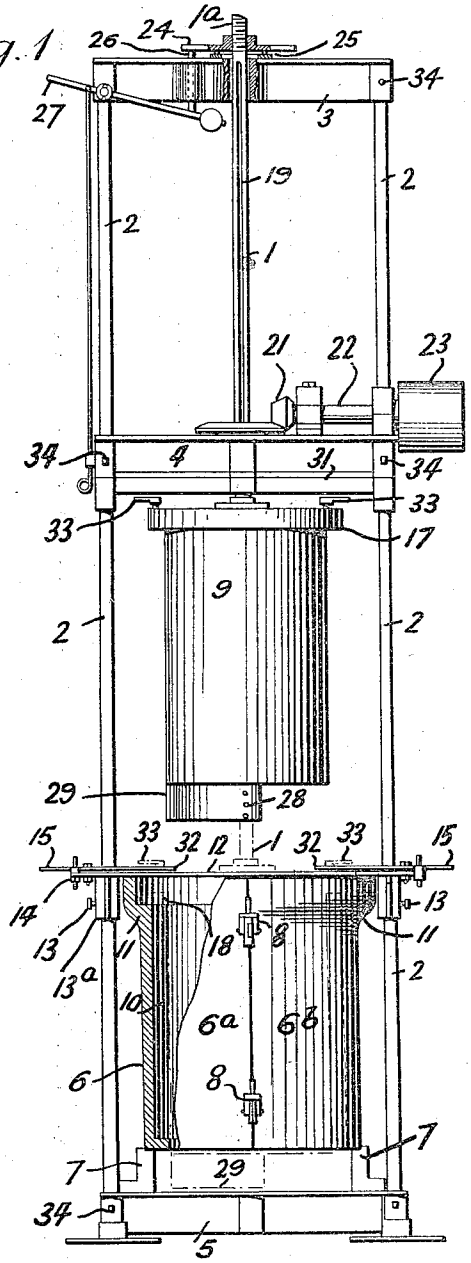
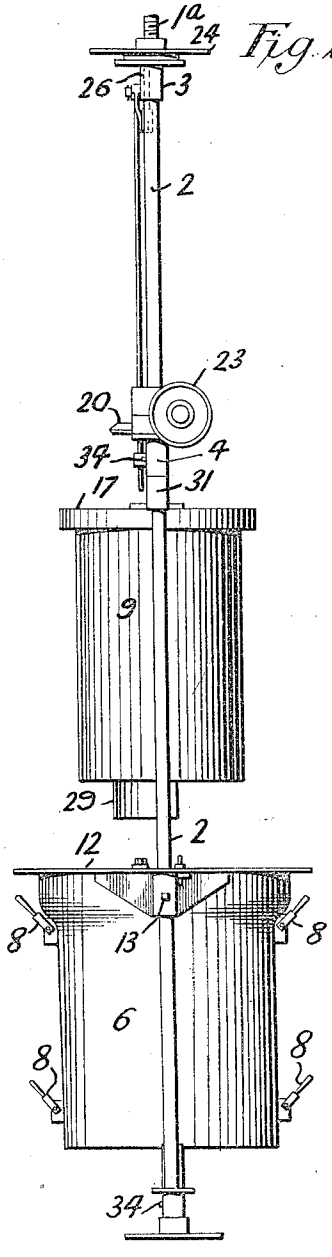


Fig. 2



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Fig. 3.

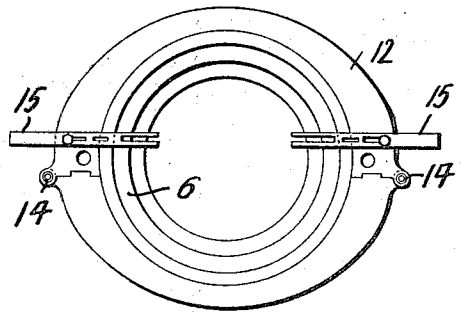


Fig. 4.

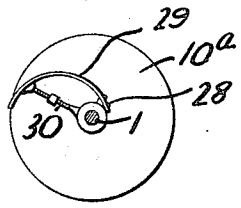


Fig. 5.

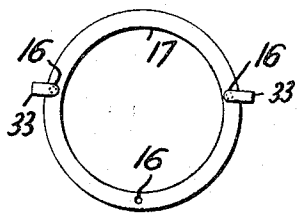
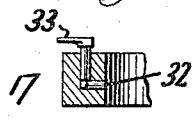


Fig. 6.



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Patented Sept. 30, 1924. 1,510,220

UNITED STATES PATENT OFFICE.

BERT HEFFER, OF ESHER, ENGLAND.

CONCRETE-PIPE-MAKING MACHINE.

Application filed March 22, 1923. Serial No. 626,886.

To all whom it may concern:

Be it known that I, BERT HEFFER, a subject of the King of Great Britain and Ireland, residing at Esher, in the county of Surrey, England, have invented Improvements in Concrete-Pipe-Making Machines, of which the following is a specification.

This invention relates to concrete pipe making machines and it has for an object to provide an improved machine comprising an outer mould and an inner withdrawable mould or core between which the concrete is fed and then tamped and whereby pipes or tubes can be produced having their bores or internal surfaces smoother, more truly cylindrical and less pervius to water than heretofore; a further object is to enable the working parts of such a machine to be easily adjusted by an ordinary operative so as to produce pipes or tubes of any of the usual sizes of any practicable length.

According to the invention, the inner mould or core is adapted to support the concrete while it is being tamped and to be withdrawn helically from the pipe so that a trowel carried at its lower end travels helically over and smooths the inner surface of the bore of the pipe or tube as said surface is exposed by the withdrawal of the inner mould or core.

Apparatus embodying the invention is illustrated by way of example in the accompanying drawings; wherein Fig. 1 is a sectional front elevation; Fig. 2 is a side view; Fig. 3 is a plan of the mould with the divided annular plate or table; Fig. 4 is an underside plan of the inner mould or core; Fig. 5 is a top plan of a ring serving as a socket core; and Fig. 6 is a detail view of means for causing the collar to grip the core.

The said apparatus comprises a vertical main shaft 1, journalled in a main frame consisting of two or more vertical members or standards 2 braced together by cross beams 3, 4, 5 at the top and bottom and intermediate thereof an outer mould 6 supported by chairs 7 adjustably carried by the bottom cross beam 5, and vertically divided into two halves 6^a, 6^b, held together by clamping handles 8; and an inner cylindrical mould or core 9 of a length corresponding to the outer mould 6 and carried by the lower end of the main shaft 1 and adapted to be raised and lowered in the space within the vertical standards 2 and between the middle and lower cross beams 4 and 5 respectively, so as to descend into the outer mould 6 or to be withdrawn therefrom.

Concrete 10 to form the moulded pipe is fed into the space between the outer mould 6 and the inner mould or core 9 and tamped, the inner mould continuously supporting the inner surface of the pipe or tube being formed during this operation. The top of the outer mould 6 is enlarged at 11 and embraced by an annular plate or table 12 slidable on the vertical standards 2 and capable of being secured in position thereon by set screws 13; this table 12, which is made in halves connected by hinge pins 14, carries radially sliding bars 15 adapted to engage studs 16 projecting upwardly from a collar or ring 17 that is thus held centrally within the enlarged part 11 of the outer mould 6 so as to act as a core for moulding a socket 18 on the pipe 10 being moulded.

The upper portion 1^a of the main shaft 1 is externally threaded or screwed, preferably with a square-cut thread, whilst its lower portion is formed with a keyway 19; the rotation of this shaft 1 is effected by means of bevel gear comprising a bevel wheel 20 connected to it by a sliding key and resting on the middle cross beam 4 and a bevel pinion 21 carried by a countershaft 22 running in bearings carried by the middle cross beam 4, and driven as by a belt drum 23.

Upon the upper end 1^a of the main shaft 1, above the top cross beam 3 there is fitted an internally threaded head wheel 24 adapted either to run freely on ball bearings 25 supported by said beam 3, or to be held against rotation by means of a clutch or brake 26 carried by this beam and controlled by a hand lever 27; when the head wheel 24 is thus held, the shaft 1 and core 9 will be slowly raised out of the outer mould 6 or lowered into the outer mould according to the direction of rotation of the pinion 21. There is secured to the lower portion of the main shaft 1 by means of set screws 28 or the like, a blade or trowel 29 (Fig. 4) projecting radially slightly beyond the base of the core, and which consequently, as the core is rotated and slowly raised, travels helically over and smooths the inner face of the bore; the blade 29 is curved backwardly and has a certain amount of spring and its sweep or radius may be adjusted by means of a right and left handed screw 30.

A radius rod or beam 31 slides on the standards 2 and laterally supports the main shaft 1 near the top of the core 9.

The operation of the machine is as follows:—

The table 12 is raised and an outer mould 6 is placed on the chairs 7, and the inner mould or core 9 is then lowered until the main shaft 1 rests on the bottom cross beam 5. The head wheel 24 is then allowed to run free, and while the inner mould 9 is rotating, cement mortar is fed into the cavity between the moulds and tamped, wire rings preferably being inserted at intervals. When the mould 6 is nearly full, the socket-forming collar 17 is placed in position and held by the sliding bars 15 on the table 12. The mould 6 is then completely filled. The radius rod 31 is then brought down to rest on the inner cylindrical core 9 and the rotation of the core continued as long as necessary; rotation of the head wheel 24 is then arrested by means of the brake 26, whereupon the inner core 9 immediately starts to rise passing through the collar 17, whilst at the same time the trowel 29 begins to operate on the exposed lower end of the pipe bore 10^a (Fig. 4). The inner mould 9 continues to rise until its lower end has entered the collar 17, which is then released from the table 12 and cam-actuated bolts 32 on the collar 17 are by means of handles 33 caused to grip the core 9 as illustrated in Fig. 6 thus causing this collar to rotate with the core and leave the finished pipe. The cams are formed on the lower ends of the studs 16, the heads of which form the handles 33.

In order to mould a different sized pipe, the chairs 7 are closed in, the table 12 and moulds 7 and 9 are changed, and if the length of the pipe is to be altered, the brackets 13^a carrying the table are suitably raised or lowered on the standards 2. It will be seen that all these adjustments can easily be effected by an intelligent operative without the aid of a skilled mechanic. To facilitate adjustment, the various vertical and horizontal members of the main frame can be adjustably secured together by means of pins 34 as shown.

What I claim is:—

1. A concrete pipe making machine comprising outer and inner moulds between which concrete is fed, the inner mould of the full length of the outer mould and being adapted to support the concrete while it is being tamped, a trowel carried at the lower end of the inner mould, and means for withdrawing helically from the pipe being made the inner mould with its trowel so that said trowel travels helically over and smooths the inner surface of the pipe as said surface is exposed by the withdrawal of the inner mould, substantially as described.

2. A concrete pipe making machine comprising an outer vertically divided mould, a coaxial inner mould of the full length of the outer mould and adapted to support concrete fed and tamped between said moulds, a trowel carried at the lower end of the inner mould and means for helically withdrawing said inner mould, substantially as described.

3. A concrete pipe making machine comprising a main frame, an outer mould supported therein, a vertical shaft journalled therein coaxial with said mould, an inner mould of the full length of the outer mould and a trowel beneath said mould both carried by the shaft, and means for lowering said inner mould into the outer mould and helically withdrawing it from same, substantially as described.

4. A concrete pipe making machine comprising an outer mould having an enlarged upper part corresponding to the pipe socket, a ring-like core, means for supporting said core within said enlarged part, an inner mould of the full length of the outer mold and adapted to support concrete fed and tamped between said moulds, a trowel carried at the lower end of the inner mould and means for helically withdrawing said inner mould, substantially as described.

5. A concrete pipe making machine comprising an outer mould having an enlarged upper part corresponding to the pipe socket, a ring-like core, means for supporting said core within said enlarged part, an inner mould adapted to support concrete fed and tamped between said moulds, a trowel carried at the lower end of the inner mould, means for helically withdrawing said inner mould, and means for securing the ring-like core to the inner mould so that it will be raised therewith, substantially as described.

6. A concrete pipe making machine, comprising an outer mould, an inner mould corresponding in length to the outer mould and adapted to support concrete fed and tamped between said moulds, a trowel carried at the lower end of the inner mould and means for helically withdrawing said inner mould and trowel so that the latter travels helically over and smooths the inner surface of the pipe being made, substantially as described.

7. A concrete pipe making machine comprising a main frame, an outer mould supported therein, a vertical shaft journalled therein coaxial with said mould and formed with screw thread and keyway, a driven wheel mounted on said shaft and prevented from moving axially, a key engaging the wheel and shaft, a threaded wheel on the threaded shaft and also prevented from moving axially, means for holding said threaded wheel against rotation and releasing same, an inner mould of the full length of the outer mould and a trowel beneath

said mould, both carried by said shaft, substantially as described.

8. A concrete pipe making machine comprising a stationary outer mould, an inner mould of the full length of the outer mould and adapted to support concrete fed and tamped between said moulds, a trowel carried at the lower end of the inner mould and means for, at will, raising, lowering and rotating said inner mould with attached trowel, substantially as described.

Signed at London, England, this 2nd day of March 1923.

BERT HEFFER.