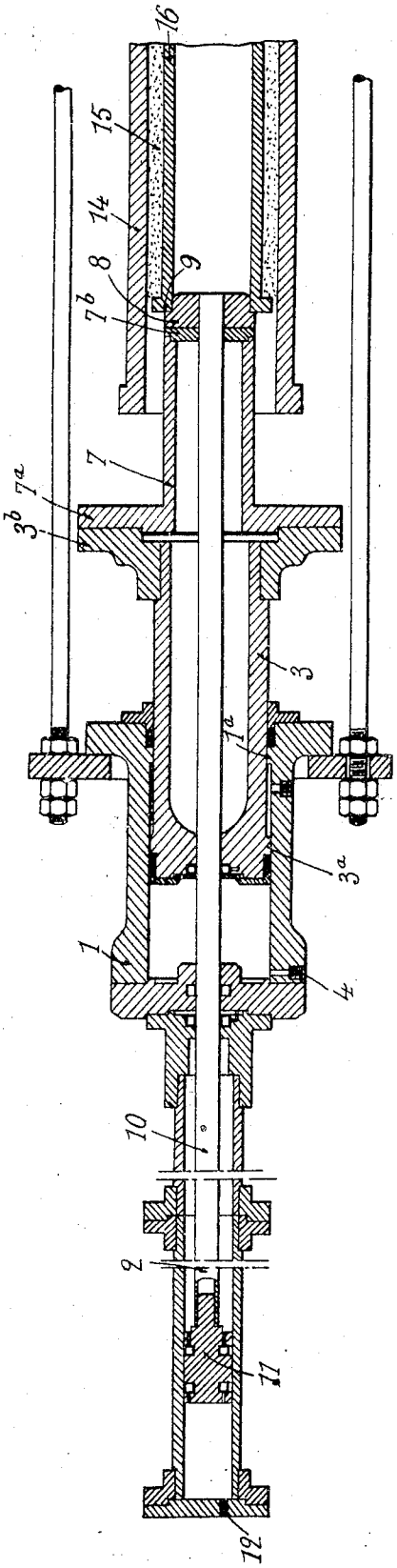
June 16, 1931. L. L. MATHIEU 1,810,183

APPARATUS FOR EJECTING PIPES CAST IN FLASKS IN ONE PIECE

Filed Dec. 29, 1928



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Patented June 16, 1931 1,810,183

UNITED STATES PATENT OFFICE

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APPARATUS FOR EJECTING PIPES CAST IN FLASKS IN ONE PIECE

Application filed December 29, 1928, Serial No. 329,207, and in France April 4, 1928.

My invention relates to an improved apparatus adapted to carry out said process for ejecting castings from molds, and more particularly, pipes of a usual type having an enlarged part or socket at one end and an annular head on the opposite end, which pipes are cast, by the centrifugal method, in a small thickness of sand, contained in a one-piece flask.

The primary objects of the invention are, firstly to provide for an easy and quick ejection of the pipes and secondly to obtain this result with as little expense of power as possible. Another object is to devise an apparatus which will be durable and reliable in operation.

The improved apparatus according to my invention comprises two hydraulic or pneumatic pistons of different cross sections, acting in succession, whereof the first serves to loosen the sand from the flask and the second to drive the pipe out of the mold.

Further characteristics of my invention will appear from the following description and be more fully pointed out in the claims.

The accompanying drawing shows a longitudinal section of a preferred embodiment of an apparatus according to my invention.

In the form of construction herein represented, the apparatus comprises two cylinders 1 and 2, placed end to end and mounted upon a stationary frame, not shown. The cylinder 1 is comparatively short and has a comparatively large diameter while the cylinder 2 has a smaller diameter and a length which substantially corresponds to that of the pipe to be ejected from the mold.

In the big cylinder 1 is movable a piston 3 adapted to be moved by a fluid under pressure such as water, gas, compressed air or the like, which is supplied at the end of the cylinder as shown at 4. The outward stroke of the piston 3 is limited by the contact between a shoulder 3^a on the piston and an annular projection 1^a on the inner surface of cylinder 1. At its outer end, the piston 3 is provided with a removable extension 7 secured to the piston through the medium of flanges 3^b and 7^a, said extension being closed by a plug 7^b.

In the cylinder 2, is provided a piston 11, whose rod 10 extends through the piston 3 and carries at its outer end a disk or ejecting head 8 having an annular shoulder 9. Fluid under pressure is supplied to the cylinder 2 through the inlet 12.

The operation is as follows: the flash 14, containing the sand mold 15 and the cast pipe 16, is brought adjacent the head 8 and securely held in position, the end of the pipe being centered on the annular shoulder 9 of the ejecting head 8. Fluid under pressure is then supplied to the big cylinder 1 whereby the piston 3 moves to the right and its plug 7^b contacts with the ejecting head 8. Owing to its large cross-section, the piston 3 will then press with a considerable force against the end of the pipe 16, through the medium of the head 8, shake up the sand and act efficiently to loosen the pipe, which is finally driven out of the mold for a distance corresponding to the stroke of the piston 3. The parts are shown in the drawing during the completion of said loosening stroke. At the end of said period, the sand is disaggregated upon the whole length of the pipe. Fluid under pressure is then supplied to the cylinder 2 and the piston 11 which had been moved to the right by the ejecting head 8 driven by the piston 3, continues its movement and drives the pipe 16 out of the mold, through the medium of the rod 10 and the head 8.

It will be seen from the above that, among other advantages, the consumption of water or other fluid under pressure is reduced during the time in which a less force is required.

Obviously, the invention is not limited to the constructional form herein described and represented, which is given solely by way of example.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. An ejector device for pipe-casting machines, comprising an ejecting head, a fluid pressure cylinder, a piston in said cylinder adapted to cooperate with the ejecting head, a second fluid pressure cylinder of

smaller cross-section than the first cylinder and having a length which substantially corresponds to that of the pipe to be ejected from the mold, and a piston in said second cylinder, adapted to cooperate with the said ejecting head.

2. An ejector device for pipe casting machines, comprising two fluid pressure cylinders of different cross-section arranged end to end, a piston in the larger one of said cylinders, the second cylinder of smaller cross-section having a length which substantially corresponds to that of the pipe to be ejected from the mold, a piston in said second cylinder, a rod on said piston, extending through the first named piston and an ejecting head on the free end of said piston rod.

3. An ejector device for pipe casting machines, comprising two fluid pressure cylinders of different cross-section arranged end to end, a piston in the larger one of said cylinders, the second cylinder of smaller cross-section having a length which substantially corresponds to that of the pipe to be ejected from the mold, a piston in said second cylinder, a rod on said piston, extending through the first named piston, an ejecting head on the free end of said piston rod and means for limiting the ejecting stroke of the piston in the first cylinder.

4. An apparatus for ejecting pipes from the flasks in which they are cast, comprising in combination a fluid driven piston in coaxial relation with the pipe to be ejected and movable in a cylinder having a length substantially equal to the length of the pipe, a rod for said piston, an ejecting head provided on said rod at the end remote from the piston and adapted to engage the pipe end, and an auxiliary fluid driven annular member located around said rod and adapted to exercise also a longitudinal thrust on the said pipe end at the beginning of the ejecting operation.

5. In an apparatus as claimed in claim 4, the provision of means for limiting the stroke of said auxiliary member to a fraction of the pipe length.

6. In an apparatus as claimed in claim 4, the further feature residing in that a part of said auxiliary member is located behind and in longitudinal register with said ejecting head so as to engage and draw along same when moved forward.

7. In an apparatus as claimed in claim 4, the provision of means for guiding said rod at points intermediate the cylinder and the pipe.

8. An apparatus for ejecting pipes from the flasks in which they are cast, comprising in combination a fluid driven piston in coaxial relation with the pipe to be ejected and movable in a cylinder having a length substantially equal to the length of the pipe, a rod for said piston, an ejecting head provided on said rod at the end remote from the piston and adapted to engage the pipe end, a second fluid driven piston coaxial with the pipe to be ejected and a cylinder for the same, both being passed through by said piston rod, the last named piston being further adapted to push on the pipe end at the beginning of the ejecting operation, and means for limiting the stroke of said second piston to a fraction of the pipe length.

9. An apparatus for ejecting pipes from the flasks in which they are cast, comprising in combination a fluid driven piston in coaxial relation with the pipe to be ejected and movable in a cylinder having a length substantially equal to the length of the pipe, a rod for said piston, an ejecting head provided on said rod at the end remote from the piston and adapted to engage the pipe end, a second fluid driven piston coaxial with the pipe to be ejected and a cylinder for the same, said piston rod being slidably fitted in and adapted to pass through said last mentioned cylinder and piston and guided thereby, the last named piston being further adapted to push on the pipe end at the beginning of the ejecting operation, and means for limiting the stroke of said second piston to a fraction of the pipe length.

10. An apparatus for ejecting pipes from the flasks in which they are cast, comprising in combination a fluid driven piston in coaxial relation with the pipe to be ejected and movable in a cylinder having a length substantially equal to the length of the pipe, a rod for said piston, an ejecting head provided on said rod at the end remote from the piston and adapted to engage the pipe end, a second fluid driven hollow piston coaxial with the pipe to be ejected and a cylinder for the same, both being slidably passed through by said piston rod, a centering member carried by said hollow piston at its free end for guiding said piston rod, the last named piston being further adapted to push on the pipe end at the beginning of the ejecting operation and means for limiting the stroke of said second piston to a fraction of the pipe length.

11. A device for ejecting pipes from the flasks in which they are cast, comprising in combination a fluid driven piston, an elongated cylinder for the same, a rod for said piston, an ejecting head provided on said rod at the end remote from the piston, a second fluid driven piston coaxial with the first named one, a cylinder for said second piston, the length of said cylinder being smaller than the length of the first named cylinder and both said second cylinder and piston being passed through by said piston rod, said second piston being further adapted to exercise a thrust on the pipe end at the beginning of the ejecting operation.

12. A device for ejecting pipes from the flasks in which they are cast, comprising in combination an elongated and longitudinally

reciprocable ejecting rod adapted to perform a stroke which is at least substantially equal to the length of the pipe to be ejected, power means for reciprocating said rod, an auxiliary pushing member adapted for reciprocation coaxially with said rod and externally thereto, power means for reciprocating said auxiliary pushing member and means for limiting the stroke of said auxiliary pushing member to a fraction of said rod stroke.

13. An apparatus for ejecting pipes from the flasks in which they are cast, comprising in combination an ejecting device adapted to exercise an axial thrust on one end of the pipe and to longitudinally move the same of a length substantially equal to the pipe length, and an auxiliary pushing device adapted also to exercise an axial thrust on the same end of the pipe at the beginning of the ejection to longitudinally move the pipe of a length only equal to a fraction of the pipe length.

14. An apparatus for ejecting pipes from the flasks, in which they are cast comprising the combination of an ejecting device having a course of movement substantially equal to the pipe length and of an auxiliary pushing device more powerful than said ejecting device and adapted to exercise an axial thrust in the ejecting direction on the pipe end but having a course of movement only equal to a fraction of the pipe length.

15. An apparatus for ejecting pipes from the flasks, in which they are cast comprising a single ejecting head having a course of movement substantially equal to the pipe length and dual means for actuating said head during at least part of its course of movement.

In testimony whereof I have signed my name to this specification.

LÉON LOUIS MATHIEU.