Dec. 5, 1939. J. ARBORIO 2,181,958

FORM FOR MOLDING CONCRETE PIPES

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Fig. 1.

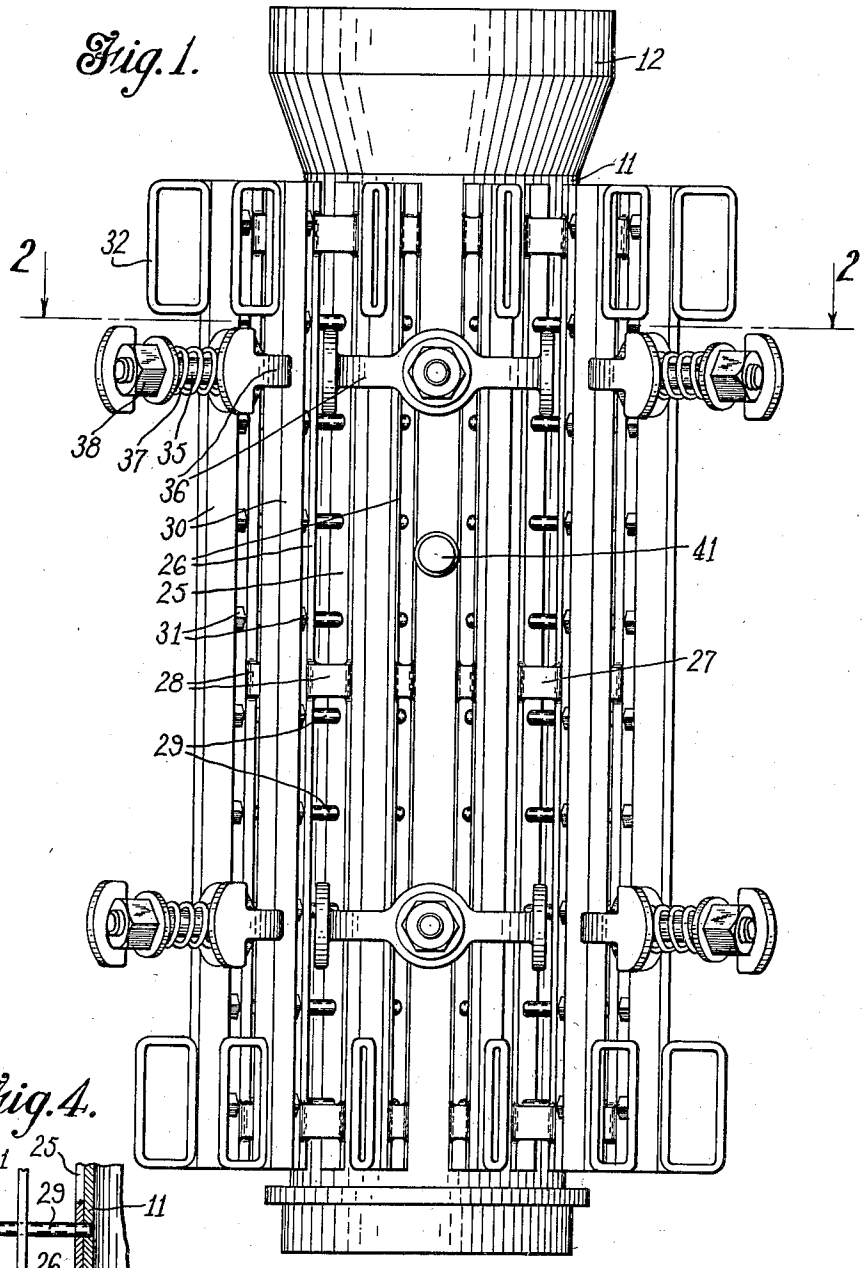
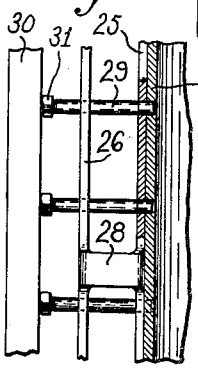


Fig. 4.



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Fig.2.

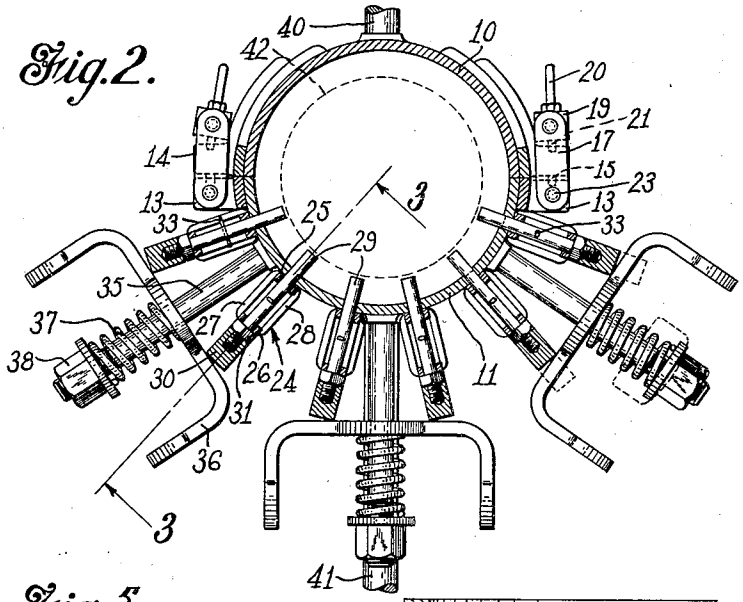


Fig.5.

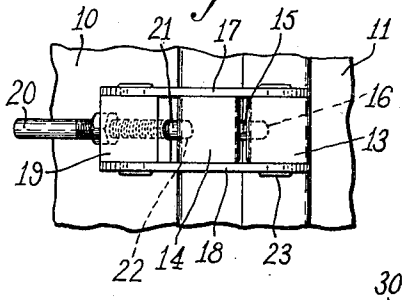


Fig.3.

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FORM FOR MOLDING CONCRETE PIPES

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12 Claims. (Cl. 25—127)

This invention relates to forms for concrete pipes or the like and more particularly to a form of this character provided with means for molding or forming a pipe having drainage openings therein or in at least a portion thereof.

In the manufacture of drainage pipes it has been found advantageous to provide perforations over the area of the upper side of the pipe in order to permit the drainage water to enter the pipe from above. Usually the lower portion or lower half of the pipe will be imperforate so that all of the water entering the pipe will be carried off, so that the form shown in the present application is one adapted to form a pipe having an imperforate lower half and a perforated upper half.

When drainage pipes are made of concrete, it is desirable to employ a form of generally cylinrical shape, the interior of the form determining the exterior size of the pipe. The concrete is packed into the form in a relatively dry condition by a machine employed for this purpose, which results in packing the concrete against the wall of the form so that the wall of the finished pipe will be of a predetermined thickness and leaving a central opening within the layer of concrete. The packing operation is usually performed with the form in a vertical position, and the concrete in a relatively dry state is packed so firmly against the wall of the form that when the operation is complete the form may be removed immediately from the pipe which will be self-sustaining during the time required for the concrete to set.

If openings are to be formed in a given area of the wall of the pipe, this can be most conveniently done during the "pouring" or packing of the concrete in the form, and in the present instance a number of pins are provided upon the form which project thereinto to make these perforations. It will be seen, however, that as the pins extend in a substantially radial direction, it would not be possible to strip the form from the pipe while the pins projected through the wall of the latter. The pins are therefore movably arranged upon the form so that they may be pulled outwardly in order to withdraw them from the wall of the finished pipe before the form is stripped therefrom. Preferably the pins will be arranged in rows or series extending longitudinally of the pipe, and all of the pins in a row may be connected to a single bar or similar member for simultaneous movement, so that they will not have to be retracted and protracted individually.

One object of the present invention is to provide a form for making concrete pipes or the like, which form will have provision for forming perforations in a pre-determined area of the wall of the pipe.

A further object of the invention is the provision of a form for making concrete pipes or the like, which form shall have movably mounted upon the exterior thereof a plurality of pins adapted to be protracted into the interior of the form to form perforations in the wall of the pipe, the pins being movable so that they may be retracted from the formed pipe prior to the stripping of the form therefrom.

A still further object of the invention is the provision of a form for making concrete pipes or the like, which form shall have movably mounted at the exterior thereof a plurality of pins adapted to be protracted into the interior of the form, and which form shall have provision for releasably holding the pins in protracted position during the "pouring" or packing of the concrete.

To these ends the invention consists of the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a side elevational view of a form embodying my invention.

Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Fig. 3 is an enlarged longitudinal sectional view of a portion of the form, on line 3—3 of Fig. 2.

Fig. 4 is a detailed sectional view showing the pins in retracted position.

Fig. 5 is a detailed view of the clamping means which secures the sections of the form together.

To illustrate a preferred embodiment of my invention, I have shown a hollow form of generally cylindrical shape, the form as illustrated consisting of two substantially semi-circular halves 10 and 11. At one end these sections may be flared as shown at 12 in order to provide for inter-fitting or over-lapping of the finished pipe when it is laid, as will be understood by those skilled in the art. Adjacent their meeting edges the sections 10 and 11 are provided with projecting lugs 13 and 14, one of these lugs being provided with a pin 15 designed to enter a depression 16 in the abuting surface of the other, so that the two sections of the form will properly register with each other. To the lug 13 is pivoted a clamping device consisting of side members 17 and 18, having pivoted between the free ends thereof a block 19. Into this pivoted block is threaded a pin or rod 20 having a projecting end

21 which may cooperate with a depression 22 in the adjacent face of the lug 14 as shown in Fig. 2. It will be understood that when the form is closed as shown in Fig. 2 the pin 20 may be grasped to swing the clamping member about its pivot 23 and thus release the two halves of the form one from the other so that they may be readily taken apart. This is, of course, done when a pipe has been formed and it is desired to strip the form sections from the pipe.

As previously stated, it has been found desirable to provide perforations in a portion of the area of the pipe. The means for effecting this result will now be described.

Upon that portion of the form to which it is desired to provide the perforations in the finished pipe are secured a number of frames 24. These frames consisting of inner and outer members 25 and 26 extending longitudinally of the pipe, these members being connected by radially extending members 27 and 28. Any number of these frames may be provided, depending upon the number of rows of perforations it is desired to make, and they will of course be spaced apart circumferentially of the pipe according to the spacing desired for the rows of perforations. As shown, three pairs of these longitudinally extending frames are provided.

The inner and outer members 25 and 26 of each of the frames are each provided with a row of perforations which register with each other and which also register with perforations formed in the section 11 of the form. Pins 29 are slidably mounted in these perforations, the pins associated with each of the frame members being connected together in gangs by being secured at their outer ends to the longitudinally extending bar 30. Between this bar and the outer frame member 26 lock nuts 31 may be provided to prevent any likelihood of the pins becoming disengaged from the bar. The bar may be provided with handles 32 by which it may be manipulated to move the pins in and out in order to protract them into the interior of the form or retract them therefrom. Cotter pins or similar devices 33 may be provided upon the pins to contact with the inner side of the member 26 in order to prevent complete disengagement of the pins from the associated frames when the pins are retracted or withdrawn from the form.

It will be apparent that as all the pins in one longitudinal row or those associated with one of the frames 24 are secured to a single bar 30, all of such pins will be retracted and protracted simultaneously. As the pins will preferably be in a protracted position within the form during the packing of the concrete therein, it will be found advantageous to provide means for resiliently and releasably holding the pins in this position, so that there will be no danger of them becoming withdrawn inadvertently and thus failing to perform their function of effecting the perforations in the finished pipe.

To effect this result, there are provided between each pair of frames 24 bolts or pins 35 which project outwardly from the forms and upon each of which is loosely mounted a retaining member 36, this member being urged toward and in contact with the bars 30 as shown in Fig. 2 by a spring 37 which re-acts against a nut 38 threaded upon the pin 35. It will be understood that the retaining member 36 may be rotated upon the bolt 35 from the position shown in Fig. 2 through an angle of 90 degrees until it no longer contacts with the bars 30. The bars and the pins attached thereto may thereupon be retracted from the form. When it is desired to hold the pins in protracted position as shown in Fig. 2, the retaining members 36 are pulled outwardly against the tension of the spring 37 and rotated to the position shown in Fig. 2 so that they will be urged against the bars 30 by the spring, thus holding these bars resiliently against the frame member 26, in which position the ends of the pins will extend within the form so that the concrete will be packed around them to form perforations in the pipe.

The operation of the device may be briefly described as follows:

When it is desired to make a concrete pipe, two complemental form sections 10 and 11 are brought together and secured by the clamping members 17 and 18. The bars 30 are moved inwardly to cause the ends of the pins 29 to project within the pipe and the retaining members 36 are turned to the position shown in Fig. 2, so that the bars 30 will be resiliently urged inwardly.

The concrete is then packed in the form by a suitable machine provided with a packer head 42 for this purpose. It is in a relatively dry condition and is packed firmly against the walls of the form, leaving an interior longitudinal opening so that a hollow pipe results. The form, together with the pipe therein, may now be moved away from the machine by means of trunnions 40 and 41 and deposited at a convenient place in a vertical position. The retaining members 36 may now be rotated to release the bars 30 which are drawn outwardly by the handles 32 so as to retract the pins 30 from the interior of the form and from the wall of the finished pipe. The clamping members 17 and 18 may now be released and the form sections 10 and 11 stripped from the finished pipe which is then permitted to set.

It will be apparent that the form herein illustrated will be admirably adapted for the formation of perforated pipe and as the pins which form the perforations are connected together in gangs they may be manipulated with a minimum of trouble. Moreover they may be withdrawn from the concrete, notwithstanding that the latter has been freshly packed, without causing any deformation in the wall of the finished pipe.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. A form for concrete pipes or the like, said form being generally of cylindrical shape and comprised of separable longitudinal sections, one of said sections having openings therein, pins movably mounted on said section exteriorly thereof and projectable into the form through said openings, and guiding means carried by said form in spaced relation thereto, said pins being slidably mounted in said guiding means to be guided thereby.

2. A form for concrete pipes or the like, said form being generally of cylindrical shape and comprised of separable longitudinal sections, one of said sections having openings therein, pins movably mounted on said section exteriorly thereof and projectable into the form through said openings, the longitudinal axes of said pins ex-

tending substantially radially of the form, and a member mounted exteriorly upon said form in spaced relation thereto to guide said ends in their movements, said pins having sliding engagement with said member.

3. A form for concrete pipes or the like, said form being generally of cylindrical shape and comprised of separable longitudinal sections, one of said sections having openings therein, pins movably mounted on said section exteriorly thereof and projectable into the form through said openings, a plurality of said pins being secured together for simultaneous movement with respect to the form, a member extending longitudinally of the frame in spaced relation therewith, said member having openings therein and said pins having sliding engagement in said openings to be guided thereby in their movements.

4. A form for concrete pipes or the like, said form being generally of cylindrical shape and comprised of separable longitudinal sections, one of said sections having openings therein, pins movably mounted on said section and projectable into the form through said openings, said pins being connected together in gangs extending longitudinally of the form, means cooperating with a pair of adjacent ones of said gangs to releasably retain said pins in protracted position, said means comprising a pin mounted between the gangs, a retaining member mounted on said pin and movable to and from retaining positions, and a spring urging said retaining member toward said gangs.

5. A form for concrete pipes or the like, said form comprising a plurality of longitudinally separable sections cooperating to form a substantially cylindrical body, a plurality of frames extending longitudinally of one of said sections and mounted on the outer surface thereof, a plurality of pins movably mounted in each of said frames extending substantially radially of, and adapted to project into, said form, and a bar connecting together a plurality of said pins for simultaneous movement into retracted and protracted positions.

6. A form for concrete pipes or the like, said form comprising a plurality of longitudinally separable sections cooperating to form a substantially cylindrical body, a plurality of frames extending longitudinally of one of said sections and mounted on the outer surface thereof, a plurality of pins movably mounted in each of said frames extending substantially radially of, and adapted to project into, said form, a bar connecting together a plurality of said pins for simultaneous movement into retracted and protracted positions, and a member engaging said bar to releasably retain said pins in protracted position.

7. A form for concrete pipes or the like, said form comprising a plurality of longitudinally separable sections cooperating to form a substantially cylindrical body, a plurality of frames extending longitudinally of one of said sections and mounted on the outer surface thereof, a plurality of pins movably mounted in each of said frames extending substantially radially of, and adapted to project into, said form, a bar connecting together a plurality of said pins for simultaneous movement into retracted and protracted positions, and a spring pressed member engaging said bar to releasably retain said pins in protracted position.

8. A form for concrete pipes or the like, said form comprising a plurality of longitudinally separable sections cooperating to form a substantially cylindrical body, a plurality of frames extending longitudinally of one of said sections and mounted on the outer surface thereof, a plurality of pins movably mounted in each of said frames extending substantially radially of, and adapted to project into, said form, a bar connecting together a plurality of said pins for simultaneous movement into retracted and protracted positions, and a member engaging said bar to releasably retain said pins in protracted position, and said member movable to a position to disengage the bar and permit retraction of the pins from the form.

9. A form for making concrete pipes or the like, said form being generally cylindrical in shape, a plurality of frames carried by the form upon the exterior surface thereof and extending longitudinally thereof in a substantially parallel relation, a plurality of pins movably mounted in each of said frames and adapted to be protracted into the form and retracted therefrom, a bar connecting together a plurality of pins associated with each frame, and means movably mounted on the form and adapted to engage a pair of adjacent bars to releasably hold the pins in the protracted position.

10. A form for making concrete pipes or the like, said form being generally cylindrical in shape, a plurality of frames mounted upon the exterior surface of the form and extending longitudinally thereof in a substantially parallel relation, a plurality of pins movably mounted in each of said frames and adapted to be protracted into the form and retracted therefrom, a bar connecting together a plurality of pins associated with each frame, a member mounted on said form between a pair of adjacent frames, a retaining member movably carried by said last-named member and adapted to be moved in position to engage the bars associated with the pins of said frames to hold the pins in protracted position.

11. A form for making concrete pipes or the like, said form being generally cylindrical in shape, a plurality of frames mounted upon the exterior surface of the form and extending longitudinally thereof in a substantially parallel relation, a plurality of pins movably mounted in each of said frames and adapted to be protracted into the form and retracted therefrom, a bar connecting together a plurality of pins associated with each frame, a member mounted on said form between a pair of adjacent frames, a retaining member movably carried by said last-named member and adapted to be moved in position to engage the bars associated with the pins of said frames to hold the pins in protracted position, and said retaining member being spring pressed toward said bars.

12. A form for molding concrete pipes comprising a member of generally cylindrical shape and having a plurality of openings in the wall thereof, pins mounted to slide in said openings, means on the exterior surface of the form to slidably support said pins, and releasable means resiliently holding said pins in their inner positions where they project within the form to form openings in the pipe.

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