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Marsh et al.

[11] **3,768,954**

[45] **Oct. 30, 1973**

[54] **DEVICE FOR FORMING AND HANDLING CONCRETE PIPE**

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[22] Filed: **Nov. 20, 1970**

[21] Appl. No.: **91,514**

Related U.S. Application Data

[62] Division of Ser. No. 829,885, June 3, 1969, Pat. No. 3,635,613.

[52] **U.S. Cl.** **425/451**, 214/653, 214/750, 214/304

[51] **Int. Cl.** **B29d 23/08**

[58] **Field of Search** ..... 214/650, 653, 651, 214/621, 750, 95 R, 1 R, 304; 425/451

[56] **References Cited**

UNITED STATES PATENTS

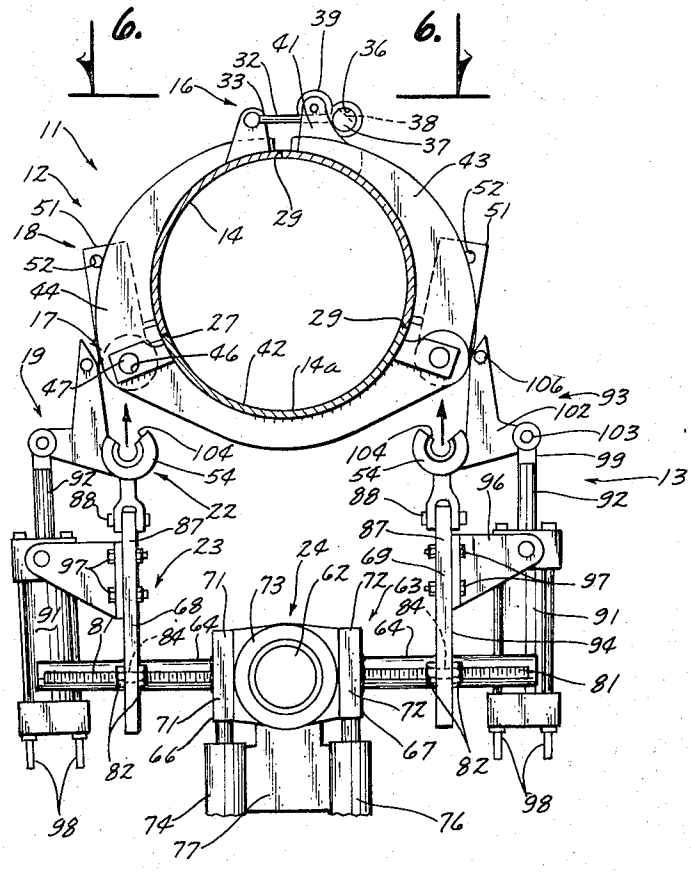
3,141,375	7/1964	Randall	214/653 UX
3,363,929	1/1968	Nelson	214/651 X
3,472,404	10/1969	Ord	214/653 X

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[57] **ABSTRACT**

This invention relates to a device for forming and handling concrete pipe which is suitable for attachment to a vehicle having a lifting mechanism. The device comprises a concrete pipe mold formed in hingeably attachable, longitudinal sections and a mold handling apparatus, attachable to the lifting mechanism of the vehicle, for handling the mold and for stripping the mold from the concrete pipe. The mold is stripped from the concrete pipe by rotating two of the longitudinal mold sections about the hinges outwardly of the concrete pipe.

13 Claims, 8 Drawing Figures



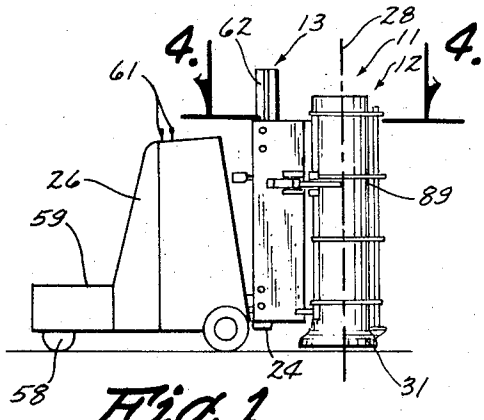


Fig. 1

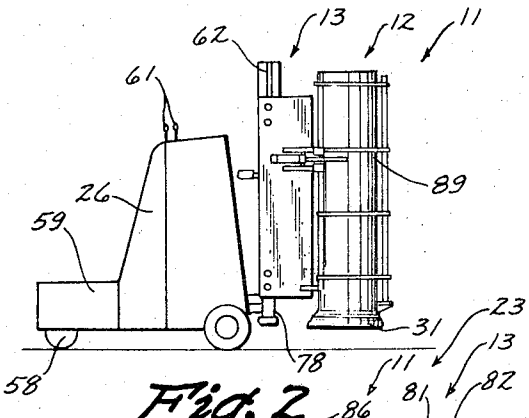


Fig. 2

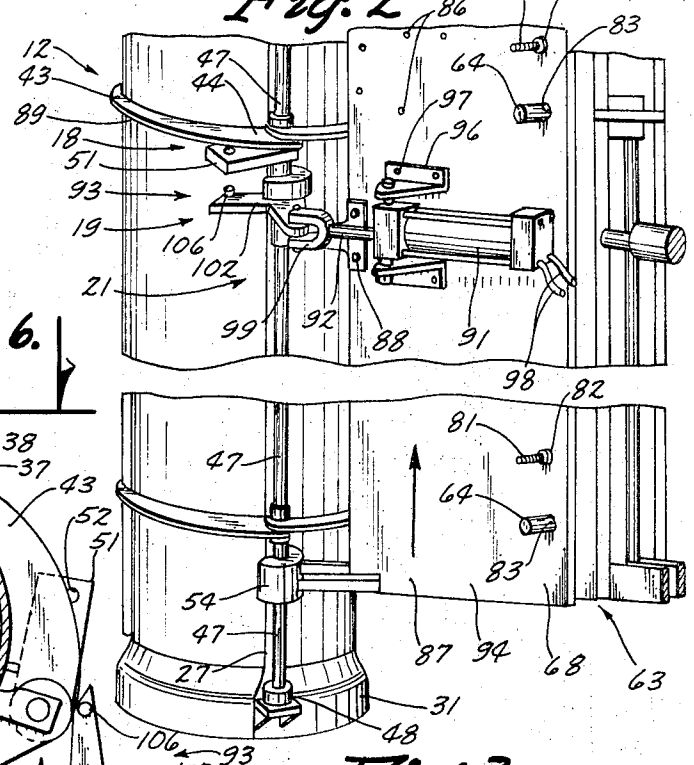


Fig. 3

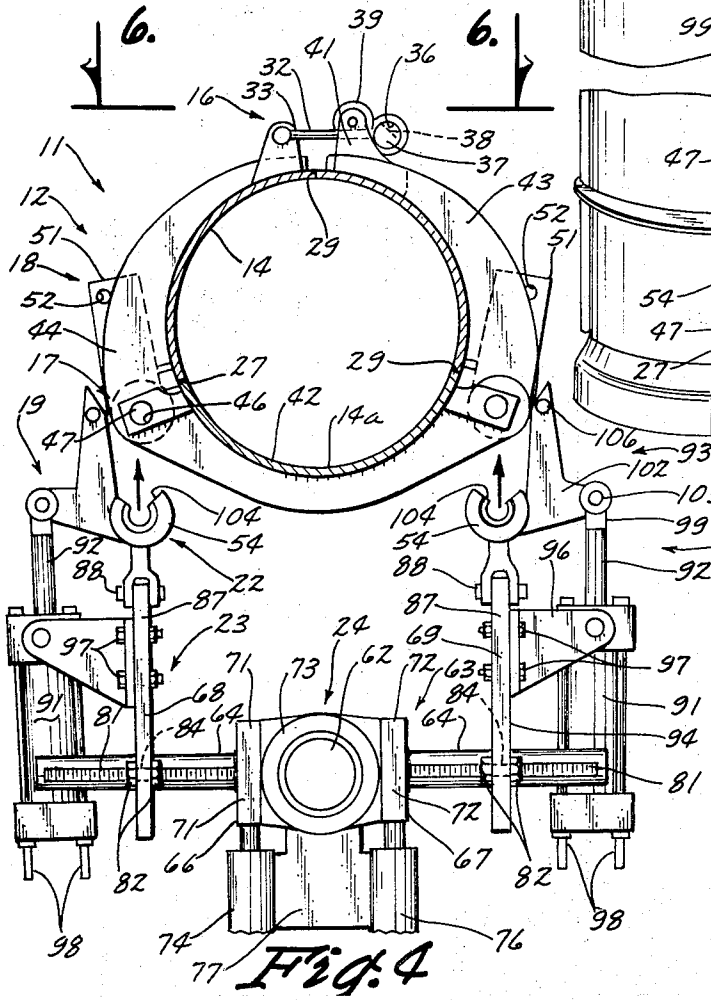


Fig. 4

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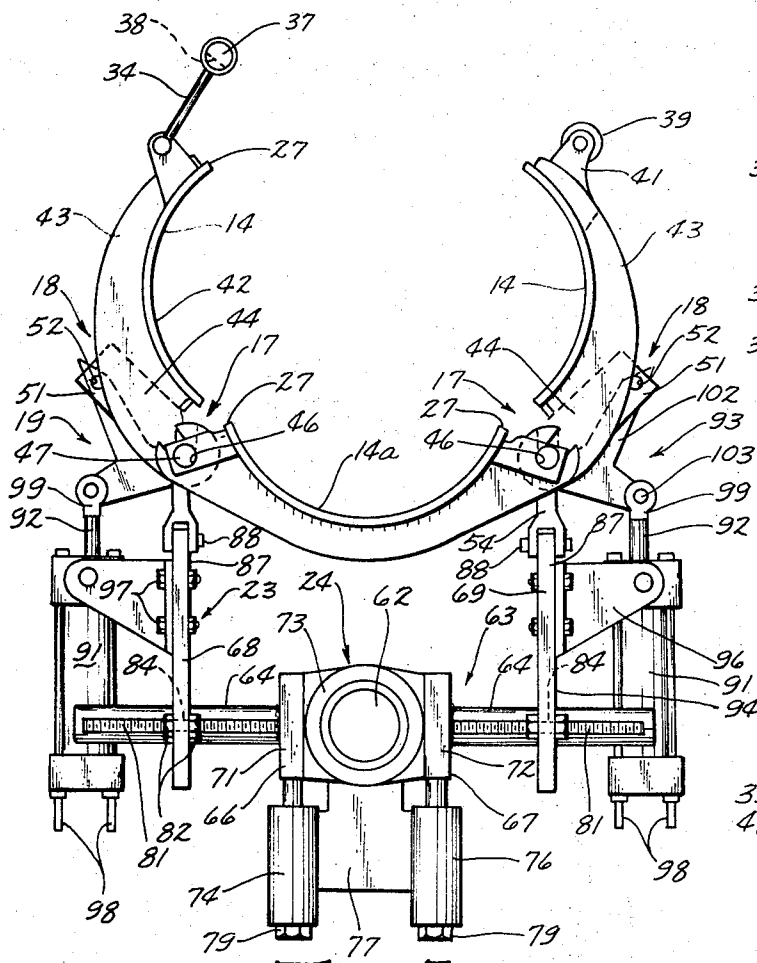


Fig. 5

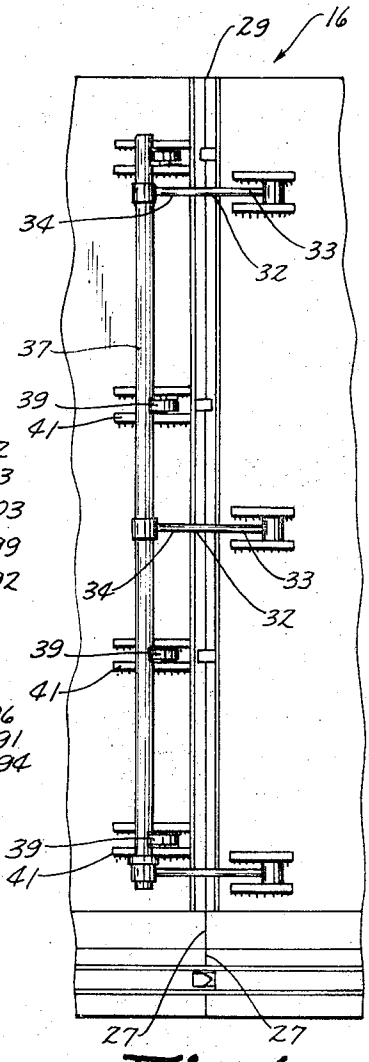


Fig. 6

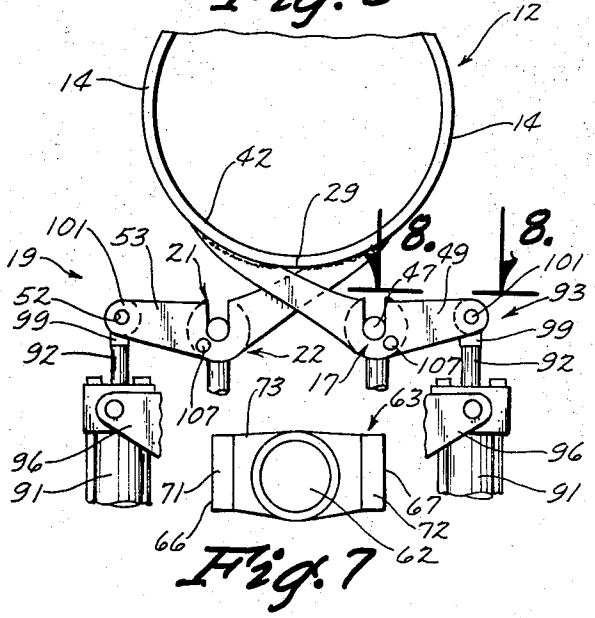


Fig. 7

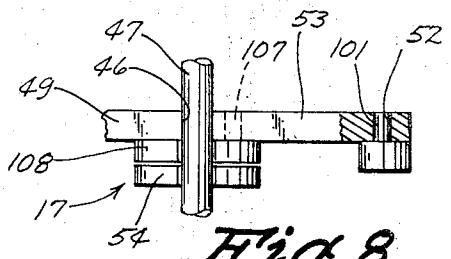


Fig. 8

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DEVICE FOR FORMING AND HANDLING CONCRETE PIPE

This is a divisional application of Ser. No. 829,885 filed June 3, 1969 entitled Device for Forming and Handling Concrete Pipe, issued Jan. 18, 1972 as U.S. Pat. No. 3,635,613.

BACKGROUND OF THE INVENTION

This invention relates to a mechanized device for forming and handling concrete pipe comprising a mold formed in hingeably attachable, longitudinal sections and a mold handling apparatus for handling the mold and for stripping the mold from a concrete pipe.

Concrete pipe is now being manufactured primarily by the packerhead or rollerhead process. By this process, plastic concrete mix is fed into a concrete pipe mold and onto a rotating packerhead or rollerhead (hereinafter referred to as "packerhead"). The "packerhead" forces the concrete mix against the inside of the mold thus forming the outside surface of the pipe while the inside surface of the pipe is formed and packed by the "packerhead." Immediately after removal of the "packerhead," the pipe is sufficiently strong to support its own weight but it must be cured to obtain maximum strength. The mold containing the newly manufactured pipe is transported to the curing area and the mold is removed from the pipe and again utilized in forming more concrete pipes.

Prior to the invention of the device herein disclosed, the mold and the concrete pipe formed therein were first loaded on a transporting device and transported to a curing area. There, the mold was manually removed from the concrete pipe after the mold and the pipe were unloaded from the transporting device. The mold was then manually reloaded and returned to the packerhead.

The device of this invention provides novel means for handling, transporting, and stripping a concrete pipe mold from a newly formed concrete pipe. This device can perform all of the functions mentioned above mechanically and simply.

Several devices for transporting objects have been described in the prior art and include: Locke, U.S. Pat. No. 2,821,317; Hansen, U.S. Pat. No. 3,172,693; and Schroeder, U.S. Pat. No. 2,754,018. A concrete molding device is illustrated in Flamand, U.S. Pat. No. 3,103,729. None of these devices, however, provides a single mechanical means for transporting concrete pipe molds with the pipe formed therein from the packerhead to the curing area, for stripping the mold from the concrete pipe and for returning the empty mold to the packerhead.

SUMMARY OF THE INVENTION

This invention relates to a device for forming and handling concrete pipe that is adapted for attachment to a vehicle having a lifting mechanism. The device comprises a mold that defines the outer configuration of the pipe and a mold handling apparatus attachable to the lifting mechanism of the vehicle. The mold comprises at least two mold sections that each define a longitudinal segment of the outer configuration of the pipe. The sections are complementary and juxtaposable along longitudinal junctures. Latching means is formed along one of the longitudinal junctures and disengagably latches the juxtaposable sections together. Hinge means hingeably attach the sections together along the other longitudinal junctures. Attaching means is formed on the sections between the latching juncture and the hinged junctures for disengagable securement of means for stripping the mold from the pipe. Coupling means for disengagable securement of means for handling the mold is also formed on the mold.

The mold handling apparatus comprises mounting means affixed to the lifting mechanism of the vehicle; handling means mounted on the mounting means and disengageably securable to the coupling means of the mold; and stripping means mounted on the mounting means and disengagably securable with the attaching means on the mold. The stripping means is capable of rotating the mold sections disposed between the latching juncture and the hinged junctures outwardly of the pipe around the hinge means thereby stripping the mold from the pipe.

It is an object of this invention to provide a novel device for forming and handling concrete pipe which is adapted for attachment to the lifting mechanism of a vehicle.

It is a further object to provide a handling apparatus which is readily adapted to any size or length of pipe molds.

Another object is to provide a handling apparatus which is capable of stripping a longitudinally hinged mold from a concrete pipe contained therein.

Yet another object is to provide a handling apparatus which is disengagably securable to a longitudinally hinged mold and which can be utilized to lift and transport the mold.

A still further object is to provide a concrete pipe mold comprising at least two mold sections that each define longitudinal segments of the outer configuration of the pipe.

Still another object is to provide increased plant efficiency with decreased manpower when manufacturing concrete pipe.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a device for forming and handling concrete pipe attached to the lifting mechanism of a motorized vehicle.

FIG. 2 is a side view, similar to FIG. 1, wherein the mold has been lifted upwardly by the mold handling apparatus.

FIG. 3 is an enlarged, broken perspective view of the mold and the mold handling apparatus.

FIG. 4 is an enlarged cross-sectional view taken along line 4—4 of FIG. 1 with the mold and the handling apparatus in disengaged relation.

FIG. 5 is an enlarged top view of this device for forming and handling concrete pipe in engaged relation with the mold in an opened position.

FIG. 6 is a front view of the latching means taken along the line 6—6 of FIG. 4.

FIG. 7 is a top view of a mold comprised of two sections and is shown in engaged relation with the mold handling apparatus of this invention.

FIG. 8 is a side view taken along line 8—8 of FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, the device for forming and handling concrete pipe is generally indicated at 11 in FIGS. 1–4 and comprises a mold 12 and a mold

handling apparatus 13. The mold 12 comprises at least two complementary and juxtaposable mold sections 14 (FIGS. 5 and 7) defining a longitudinal segment of a concrete pipe (not shown). Along one longitudinal juncture of the mold sections 14, latching means 16 (FIG. 6) are formed while along the other longitudinal junctures, hinge means 17 are formed. Attaching means 18 (FIGS. 3–5) are formed on the sections 14 between the latching means 16 and the hinge means 17 for disengagable securement of the stripping means 19 (FIGS. 3–5 and 7) of the mold handling apparatus 13. Coupling means 21 (FIGS. 3 and 7) are formed on the mold 12 for disengagable securement of the handling means 22 of the mold handling apparatus 13. A mounting means 23 mounts the stripping means 19 and handling means 22 on the lifting mechanism 24 of the vehicle 26 (FIGS. 1 and 2).

More specifically, the mold 12 (FIGS. 3–7) defines the outer configuration of the concrete pipe (not shown) and is generally comprised of two or three mold sections 14. Each of the mold sections 14 is normally disposed in an upstanding position and defines a longitudinal segment of the outer configuration of the pipe. The mold sections 14 complement each other and are juxtaposable to, thereby, form the entire outer configuration of the pipe with the exception of the pipe ends. The mold sections 14 have side edges 27 which are substantially parallel to the longitudinal axis 28 of the pipe. Therefore, when the mold sections 14 are juxtaposed, longitudinal junctures 29 between the mold sections 14 are formed, the longitudinal junctures 29 being substantially parallel of the longitudinal axis 28 of the pipe and, generally, perpendicular of the ground.

The mold sections 14 can be formed in a variety of inside configurations to obtain concrete pipe having that outside configuration. The most usual and preferred inside configuration is circular whereby cylindrical pipe can be obtained. One end 31 (FIG. 3) of the mold sections 14 may be enlarged to form a pipe with a bell or groove thereby facilitating joining adjacent pipe sections together. A pallet (not shown) can be secured in this end 31 to facilitate forming the lower end of the pipe.

When the mold 12 is comprised of two mold sections 14 (FIG. 7) and is generally circular, each mold section 14 preferably defines 180° of the circle. When the mold is comprised of three mold sections 14 (FIGS. 3–5), the rear section 14*a* encompasses less than 180° in which case the other two sections 14 encompass the balance of the 360°. It is preferred that the rear section 14*a* encompass 144° and the other two sections 14 encompass 108°. This sectioning has been found to give superior results but is not critical herein.

Latching means 16 is formed along one of the longitudinal junctures 29 between mold sections 14 and disengagably latches the juxtaposable mold sections 14 together. Preferably, the latching means 16 is formed along the foremost juncture 29 or the juncture 29 farthest from the handling apparatus 13.

The latching means 16 (FIGS. 4–6) comprises at least two latch arms 32 which are substantially horizontally disposed and pivotally secured at one end 33 to a mold section 14 adjacent the foremost juncture 29. The other end 34, or the free end, has a mounting hole 36 formed vertically therein suitable for rotatably securing a latch bar 37 therein. The latch bar 37 is generally of substantially cylindrical configuration and is rotatable about its longitudinal axis. One side 38, or a portion thereof, (FIGS. 4–5) is flattened to provide means for moving the latch bar 37 over the rollers 39 rotatably secured to the adjacent mold section 14 by bifurcated ears 41. When the latch bar 37 is moved over the rollers 39, the latch bar 37 is rotated to secure the latch bar 37 in latching engagement.

Although the preferred latching means 16 is described above, conventional latching means 16 can also be utilized herein.

Hinge means 17 are formed along the other longitudinal junctures 29 and hingeably attach adjacent, juxtaposable mold sections 14 together. The hinge means 17, preferably, have pivot points spaced outwardly of the inside surface 42 of the mold 12.

The hinge means 17 (FIGS. 3–5) wherein the mold 12 is made up of three mold sections 14 comprise support members 43 extending outwardly of the mold sections 14 and rigidly attached thereto. The end portions 44 of the support members 43 are superposable and have vertically aligned apertures 46 formed therethrough. The apertures 46 are formed outwardly of the inside surface 42 of the mold 12 and outwardly of the longitudinal junctures 29. Hinge bars 47 extend vertically through the vertically aligned apertures 46 and hingeably attach adjacent, juxtaposable mold sections 14 together. The hinge bars 47 are rotatably secured in position by journal boxes 48 (FIG. 3—lower journal box only shown).

The hinge means 17 (FIGS. 7 and 8) wherein the mold 12 is made up of two mold sections 14 is of essentially the same configuration. Substantially horizontally disposed arms 49 are rigidly affixed to each mold section 14. The arms 49 extend outwardly and cross each other and then continue outwardly on opposite sides of the mold 12. The arms 49 are rigidly attached to adjacent mold sections 14 proximate the longitudinal juncture 29. The arms 49 are disposed one above the other on each mold section 14 and have vertically aligned apertures 46 formed therein. Again, hinge bars 47 extend vertically through the vertically aligned apertures 46 and hingeably attach adjacent mold sections 14 together.

Attaching means 18 are formed on the mold sections 14 between the hinged longitudinal junctures 29 and the latched longitudinal juncture 29 for a disengagable securement of stripping means 19. The attaching means 18 (FIGS. 3–5) of the mold 12 comprising three mold sections 14 are plates 51 rigidly affixed to the support members 43 proximate the hinged longitudinal junctures 29. The plates 51 each have a hole 52 formed therein for disengagable securement of stripping means 19.

In the mold 12 comprising two mold sections 14 (FIGS. 7–8), the arms 49 are extended outwardly of the mold 12 and a hole 52 formed in each end portion 53 of the arms 49. The holes 52 are suitable for disengagable securement of stripping means 19.

Coupling means 21 is also formed on the mold 12 for disengagable securement of the handling means 22. In FIGS. 3–5, a preferred coupling means 21 is shown. There, the hinge means 17, as before described, doubles as the coupling means 21. The hinge bars 47 can be partially encompassed by the bifurcated fingers 54 (described in detail hereinafter) and the entire mold 12 can be lifted by moving the fingers 54 upwardly against the support members 43. In FIGS. 7 and 8, the hinge

bars 47 and the arms 49 serve as the coupling means 21 as described above.

The mold handling apparatus 13 for use with the above described longitudinally hinged, pipe molds 12 is adapted for attachment to the lifting mechanism 24 of the vehicle 26. The vehicle 26 (FIGS. 1–2) has a motor (not shown), wheels 58, an operator's station 59, and a number of controls 61 to regulate movement of the vehicle 26 and the lifting mechanism 24. The lifting mechanism 24 is preferably a vertically disposed hydraulic cylinder 62 capable of lifting the mold 12 and the pipe contained therein and capable of moving them from place to place. As a safety feature, the hydraulic cylinder 62 can have a shortened stroke and, therefore, cannot drop the mold 12 on the ground (See FIG. 1). This feature prevents inadvertent release of the mold 12 while the vehicle 26 is in motion.

The mounting means 23 (FIGS. 3–5) is affixed to the lifting mechanism 24 and comprises a carriage 63 rotatably attached to the hydraulic cylinder 62; upper and lower mounting bars 64 extending from opposing sides 66 and 67 of the carriage 63 which are aligned and horizontally disposed; and two side aprons 68 and 69 mounted on the mounting bars 64 on opposing sides 66 and 67 of the carriage 63 and extending forwardly of the carriage 63. The mounting means 23 of FIGS. 3–5 can also be used with the two section mold 12 of FIGS. 7–8.

The carriage 63 (FIGS. 4 and 5) comprises two side elements 71 and 72 secured around the hydraulic cylinder 62 by mounting brackets 73. Although the carriage 63 is rotatably mounted on the hydraulic cylinder 62, the degree of rotation about the axis of the hydraulic cylinder 62 is limited by two spring members 74 and 76 (FIG. 5) mounted on a leg 77 which, in turn, is rigidly affixed to the base 78 (FIG. 2) of the lifting mechanism 24. The leg 77 (FIGS. 4 and 5) extends outwardly of the carriage 63 and is generally horizontally disposed. The spring members 74 and 76 have spring-mounted pistons mounted therein which bear against opposite sides 66 and 67 of the carriage 63. The spring compression and, therefore, the degree of rotation of the carriage can be adjusted with nuts 79 (FIG. 5). The spring members 74 and 76 may be mounted as shown in FIG. 5 or they may be mounted in opposition to each other and in parallel relation to the mounting bars 64.

This rotation feature of this invention is very important if the pipe is released from the mold 12 and the vehicle 26 is backed away at an angle from the pipe. If the carriage 63 was nonrotatable, the pipe would either be knocked over or scored by the mold 12. However, with this rotatable feature, the carriage 63 merely rotates on the hydraulic cylinder 62 when the mold 12 contacts the pipe and the pipe is left erect and undamaged. This same feature assists the operation in returning the empty molds 12 to the packerhead.

The mounting bars 64 (FIGS. 3–5), both upper and lower mounting bars 64, are rigidly affixed to the side elements 71 and 72 and are generally horizontally disposed. The mounting bars 64 are usually disposed at right angles to the ordinary line of travel of the vehicle 26. The cross-sectional configuration of the mounting bars 64 is not critical; the cylindrical configuration shown in FIG. 3, however, is convenient and generally used.

Upper and lower adjustment rods 81 (FIGS. 3–5) also project from opposing sides 66 and 67 of the carriage 63. The adjustment rods 81 are vertically aligned with the mounting bars 64 and are threaded. Nuts 82 are threadably provided on the adjustment rods 81 on the inside and outside of each of the side aprons 68 and 69. The nuts 82 secure the side aprons 68 and 69 in position and are utilized to adjust the position of the side aprons 68 and 69 on the mounting bars 64.

The side aprons 68 and 69 (FIG. 3) are formed from steel or the like, are usually planar, have an aperture 83 formed therethrough for the mounting bar 64, and have an aperture 84 formed therethrough for the adjustment of rod 81. A plurality of bolt holes 86 are formed through the side aprons 68 and 69 for adjustably mounting the handling means 22 and the stripping means 19.

The handling means 22 comprises a plurality of bifurcated fingers 54 adjustably secured to the foremost portion 87 of the side aprons 68 and 69 by nuts and bolts 88. They can also be rigidly affixed to the side aprons 68 and 69, as by welding. The fingers 54 are formed to receive the hinge bars 47 of the mold 12. When the fingers 54 are positioned around the hinge bars 47, the hydraulic cylinder 62 is raised and the fingers 54 abut the lower surface 89 of the support member 43 and lift the mold 12.

The fingers 54 are normally horizontally disposed and extend forwardly of the side aprons 68 and 69. The fingers 54 are adjustable on the side aprons 68 and 69 to facilitate handling all lengths and diameters of concrete pipe molds 12.

The stripping means 19 (FIGS. 3–5) comprises a hydraulic cylinder 91 mounted on each side apron 68 and 69, a piston 92 secured in each cylinder 91, and means 93 for disengageably securing the piston 92 to the attaching means 18 of the mold 12.

The hydraulic cylinders 91 are mounted on the outside surface 94 of the side aprons 68 and 69 by mounting brackets 96 and are generally horizontally disposed. The hydraulic cylinders 91 are adjustably mounted by nuts and bolts 97 to facilitate handling of all diameters and lengths of concrete molds 12. Suitable hydraulic lines 98 are provided to supply hydraulic fluid to the cylinders 91.

A piston 92 is secured in each of the cylinders 91 and extends forwardly of the side aprons 68 and 69. In the embodiment shown in FIGS. 3–5, the forward end 99 of the piston 92 has a pin 101 formed thereon which is insertable in hole 52 thereby disengagably securing the pistons 92 in the arms 49.

In the embodiment shown in FIGS. 3–5, a stripping shoe 102, is rotatably secured to the piston 92 between the bifurcations at the forward end 99 thereof by trunnion 103. The stripping shoe 102 is also rotatably secured to a bifurcated finger 54 on each side apron 68 and 69. A notch 104 is formed in the stripping shoe 102 which, when the piston 92 is extended in the cylinder 91, is superposable with the void between the bifurcations of the fingers 54. When the piston 92 is contracted, the stripping shoe 102 locks on the hinge bars 47 as notch 104 rotates with the stripping shoe 102 (See FIG. 5).

The stripping shoe 102 (FIGS. 3–4) is normally horizontally disposed and has an upstanding pin 106 formed thereon. This pin 106 is engagable with the hole 52 formed through plates 51 of the mold 12. When the piston 92 is retracted, the mold sections 14 between the latching juncture 29 and the hinged junctures 29 are

rotated outwardly of the pipe around the hinge bars **47** thereby stripping the mold **12** from the pipe (See FIG. 5).

The mold **12** shown in FIGS. 7 and **8** is opened in much the same way. Here, however, the pistons **92** must be extended to open the mold **12** and pin means **107** must be provided on the rotatable shoe **108** which is rotatably affixed and superposable with the bifurcated fingers **54.** The pin means **107** secures the mold handling apparatus **13** to the mold **12.** Conversely, the positions of the bifurcated fingers **54** and the hydraulic cylinders **91** can be reversed, thereby allowing contraction of the piston **92** to open the mold **12.**

In both embodiments shown, the mold handling apparatus **13** is disengagably securable to the mold by positioning the mold handling apparatus **13** appropriately and then raising the hydraulic cylinder **62.** The hydraulic cylinder **62** can be raised further to lift the mold **12** and the pipe contained therein from the ground.

Although a preferred embodiment has been described, it is to be remembered that various modifications may be made without departing from the invention as defined in the appended claims.

We claim:

1. A mold handling apparatus for use with a concrete pipe mold having a pair of longitudinally hinged sections, and adapted for attachment to a vehicle having a lifting mechanism; said handling apparatus comprising:

mounting means affixed to the lifting mechanism of the vehicle;

handling means mounted on said mounting means and disengagably securable to the mold;

stripping means mounted on said mounting means and disengagably securable to the hinged sections of the mold, said stripping means being capable of rotating said hinged sections outwardly of a pipe contained therein thereby stripping the mold from the pipe.

2. The handling apparatus of claim **1** adapted for attachment to a vehicle having a normally vertically disposed hydraulic lifting cylinder wherein said mounting means comprises:

a carriage attached to the lifting cylinder;

mounting bars extending from said carriage; said mounting bars being aligned and horizontally disposed;

two side aprons mounted on said mounting bars on opposing sides of said carriage and extending forwardly of said carriage.

3. The handling apparatus of claim **2** wherein said handling means comprises a plurality of bifurcated fingers mounted on said side aprons and extending forwardly of said side aprons; said fingers being normally horizontally disposed.

4. The handling apparatus of claim **3** where said stripping means comprises:

at least one hydraulic cylinder mounted on each of said side aprons and substantially horizontally disposed;

a piston secured in each of said cylinders and extending forwardly of the side apron, said piston being movable in said cylinder;

a stripping shoe rotatably secured to said piston and rotatably secured to one of said bifurcated fingers;

pin means mounted on said stripping shoe and projecting upwardly therefrom, said pin means being engagable with the attaching means on the hinged sections of the mold.

5. The handling apparatus of claim **4** wherein the portion of said stripping shoe rotatably affixed to said bifurcated finger has a notch formed therein, said notch being superposable with the void between the bifurcations of said finger when said piston is extended in said cylinder.

6. The handling apparatus of claim **5** wherein said carriage is horizontally rotatable on said lifting cylinder and wherein the horizontal rotation is limited by:

a leg rigidly attached to the base of the lifting cylinder and extending outwardly of said carriage;

two spring members mounted on said leg and bearing against opposite sides of said carriage thereby limiting the horizontal rotation of said carriage.

7. The handling apparatus of claim **6** wherein adjustment rods project from two opposing sides of said carriage, said adjustment rods being aligned with said mounting bars and adjustably mounting said side aprons.

8. The handling apparatus of claim **7** wherein said bifurcated fingers are adjustably affixed to said aprons and wherein said hydraulic cylinders are adjustably affixed to said aprons.

9. A mold handling apparatus for use with a concrete pipe mold having a pair of longitudinally hinged sections defining the outer configuration of a pipe, the handling apparatus comprising:

handling means disengagably securable to the mold, said handling means comprising a bifurcated finger; and

stripping means disengagably securable to the mold and comprising a shoe element, one portion of which is bifurcated and superposable with said bifurcated finger, a second portion of which is disengagably securable to the mold, and a third portion of which is engagable with a stripping motor means, said stripping motor means operable to rotate the hinged sections outwardly from each other.

10. Mold handling apparatus as defined in claim **9,** and wherein said stripping motor means comprises a piston and cylinder device the piston of which is rotatably engaged with said third portion, movement of said piston rotating said finger thereby swinging a hinged section engaged by said finger relative to another section.

11. A mold handling apparatus for use with a concrete pipe mold having at least a pair of longitudinally hinged sections defining the outer configuration of the pipe, the handling apparatus comprising:

handling means disengageably securable to the mold; and

stripping means disengageably securable to the hinged sections of the mold, said stripping means operable to rotate the hinged sections outwardly from each other, said stripping means including a stripping shoe one portion of which is bifurcated and adapted to engage an upstanding element of the mold and another portion of which is disengageably securable with the mold, said shoe adapted to be pivotally moved horizontally about the upstanding element.

12. A mold handling apparatus for use with a concrete pipe mold having a pair of longitudinally hinged sections defining the outer configuration of the pipe, a vertical hinge rod extended through a journal device at

each junction of said hinged sections, said apparatus adapted for attachment to a movable carrier:

a support element adapted to be secured to the exterior of the mold and when secured having a pair of angularly spaced portions disposed in the same horizontal plane with each other;

a pair of bifurcated members each engageable with one of the hinge rods;

a pair of shoes, one for each of said members, disengageably connectable with one of said portions; and

power means connected between each one of said shoes and the carrier, said power means operable to pivot each of said shoes about the respective connection of each member with its hinge rod, said shoes movable away from each other from a position wherein said sections are closed, when said members are engaged with the hinge rods, to a position wherein said sections are open, said shoes movable toward each other from a position wherein said sections are open, when said members are engaged with the hinge rods, to a position wherein said sections are closed.

13. A mold handling apparatus as defined in claim **12,** and wherein each bifurcated member engages a hinge rod directly below a journal, and with lift means provided for connection to the carrier, said lift means operable to raise said members whereby to vertically move the mold.

* * * * *