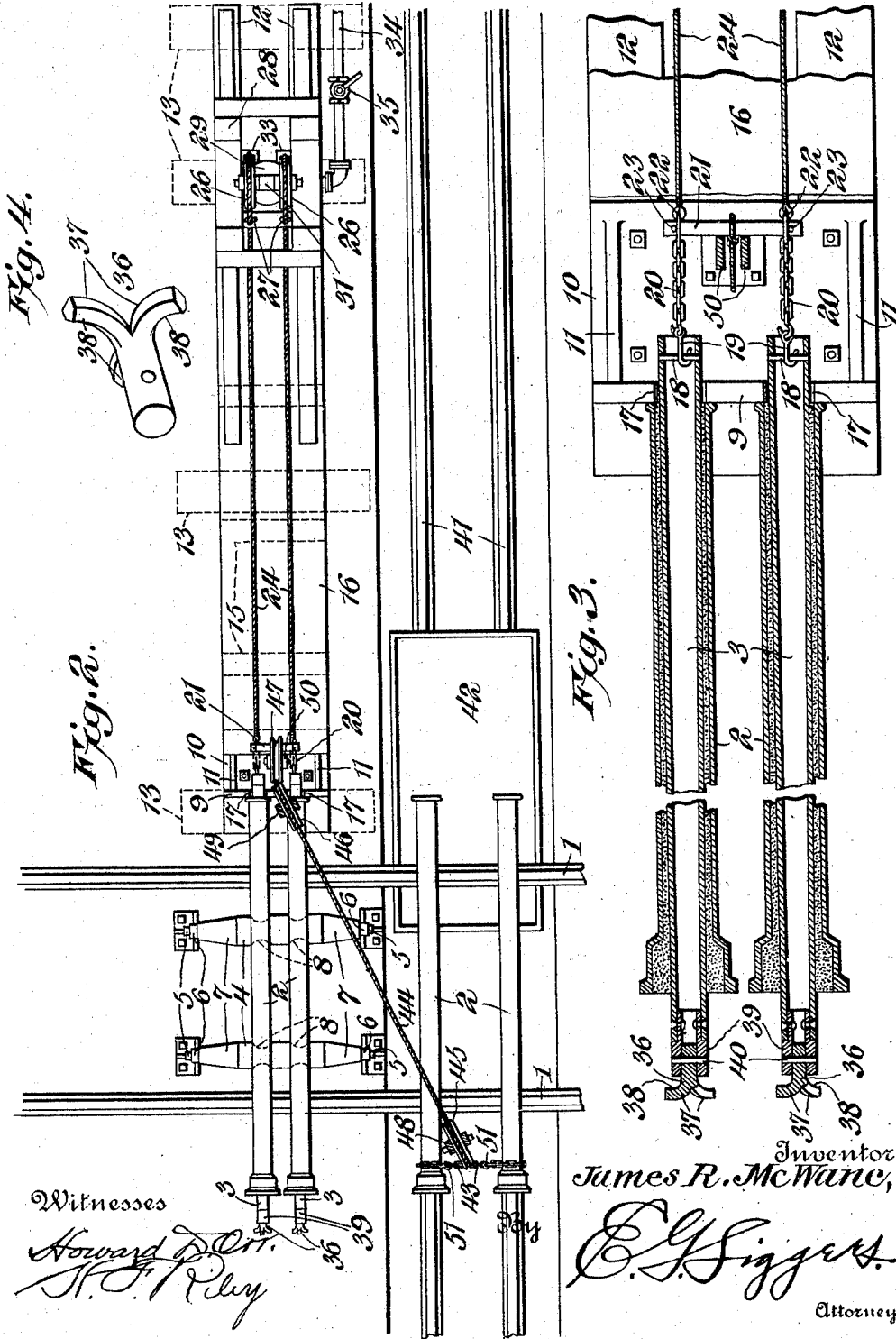


J. R. McWANE.
CORE BAR PULLING AND CORE CUTTING APPARATUS.
APPLICATION FILED JUNE 16, 1910.

967,041.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

JAMES R. McWANE, OF BIRMINGHAM, ALABAMA.

CORE-BAR-PULLING AND CORE-CUTTING APPARATUS.

967,041.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed June 16, 1910. Serial No. 567,320.

To all whom it may concern:

Be it known that I, JAMES R. McWANE, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented a new and useful Core-Bar-Pulling and Core-Cutting Apparatus, of which the following is a specification.

The invention relates to a core bar pulling and core cutting apparatus, and is an improvement on that shown and described in my co-pending application, filed Nov. 18, 1909, Serial No. 528,750.

The principal object of the invention is to provide means for enabling the core material to be readily emptied or discharged from the pipes after the same have been pulled, and to arrange the apparatus so as to elevate one end of such pipes simultaneously with the pulling of the core bars in other pipes, in order to utilize the weight of the elevated pipes to return the apparatus to its initial position after the pulling operation has been completed, thereby dispensing with the weight employed in the said application for this purpose.

The ordinary spring cutter is comparatively delicate, liable to be broken and the cost of its upkeep is considerable.

Another object of the invention is to produce a strong, durable and efficient cutter, not easily broken and capable of standing rough usage.

Heretofore core bars have been made tapering, but the taper has been utilized for the purpose of freeing the core bar as it is drawn from the upper ends of the pipes.

Another object of the invention is to enable a tapering core bar to perform the functions of the flange, which, in the aforesaid application, holds the core bar and the pipe intact while shaking out the flask and also to free the core bar in pulling the same from the pipes.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sac-

rificing any of the advantages of the invention.

In the drawings:—Figure 1 is a side elevation of a pipe pulling and core cutting apparatus, constructed in accordance with this invention. Fig. 2 is a plan view. Fig. 3 is an enlarged horizontal sectional view of a portion of the apparatus, illustrating the arrangement of the core bars and the means for connecting the core bars with the pulling mechanism. Fig. 4 is an enlarged detail perspective view of one of the cutters.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1—1 designate the rails of a track down which roll pipes 2 after the same have been pulled from the flasks by the core bars 3. In order to enable the pipes to be pulled by the core bars 3, the latter are tapered upwardly, being larger at their lower ends, and when the flasks are shaken out, the taper of the core bars tends to compress the core material, which offers sufficient resistance to the core bars to prevent the same from being pulled out from the pipes. The pipes are pulled by connecting the crane with the shackles (not shown) with which the upper smaller ends of the core bars are equipped and which are removed from the core bars prior to the arrival of the pipes at the core pulling apparatus.

The pipes roll onto a pair of pipe supporting rolls 4, located between the rails 1 of the pipe track and extending longitudinally of the latter and provided with terminal journals or gudgeons 5, arranged in suitable bearings of brackets 6. The pipe supporting rolls 4, which are constructed similar to those of the aforesaid application, have tapered end portions 7 to enable the pipes to be readily rolled on and off of them, and the said rolls 4 are provided at opposite sides of the center with annular centering grooves 8, adapted to aline the pipes with the core pulling mechanism, which is located at one side of the pipe track. The pipes are rolled onto the longitudinal rolls 4 at one end thereof, and are rolled off at the other end of the same after the core bars have been pulled. When the pipes rest in the centering grooves of the rolls 4, they are supported above the rails 1 of the pipe track, so that they may be freely moved in a longitudinal

direction to position them properly with relation to the core bar pulling mechanism.

The core bar pulling mechanism is equipped with an abutment 9, constructed as described in the said application, and consisting of a vertical pipe engaging portion, a horizontal attaching portion 10 and integral webs 11, located at opposite sides of the abutment. The horizontal attaching plate 10 is seated upon and bolted to a pair of parallel beams 12, which are laid upon transverse sills or supports 13. The spaced parallel beams 12 form supports for short blocks or posts 14, arranged at intervals and connected by transverse top bars 15 to which a core bar receiving platform 16 is secured.

The vertical portion of the abutment is provided with half round recesses or openings 17, which are of sufficient size to permit the tapered core bars 3 to pass through them. The recesses or openings 17 are substantially the diameter of the interior of the pipes, so that the adjacent ends of the same will fit against the vertical portion of the abutment 9 and be held against movement when the core bars are pulled.

The core bars project beyond the vertical portion of the abutment 9 and are provided with interiorly arranged transverse pins 18, which are engaged by hooks 19 of short chains 20. The chains 20 are connected with and spaced apart by a cross bar 21, the terminal links 22 being of sufficient size to receive the ends of the cross bar 21, which is perforated for the reception of keys 23 for retaining the chains on the cross bar. The terminal links are also connected with cables 24, or other suitable flexible connections, and the chains and hooks constitute the connecting means for attaching the cables to the core bars.

The cables, which are parallel, extend beneath lower guide pulleys 25 and upward over upper guide pulleys 26, and are secured at their inner ends 27 to an upright frame 28 in which a hydraulic cylinder 29 is mounted. The frame may be of any suitable construction and the pulleys 25, which constitute the lower guiding means, are grooved and are mounted in a suitable bracket 30, which also supports the lower end of the hydraulic cylinder 29. The pulleys 26, which constitute the upper guiding means for the cables, are also grooved and are mounted in suitable bearings of a bracket 31, which is carried by the plunger 32 of the hydraulic cylinder. The reeving of the cables around the upper guiding means in the manner shown secures a relatively long pull from a comparatively short stroke. The cylinder is provided at its upper portion with a horizontally projecting flange 33, having suitable guide openings for the cables 24. The fluid pressure is admit-

ted to the cylinder through a feed pipe 34, having a suitable controlling valve 35. When the plunger moves upward, the outer end of the cables are drawn inward and toward the frame, thereby pulling the core bars from the pipes. This core bar pulling mechanism is similar to that shown and described in the said application, in which the upward movement of the plunger pulls the core bars and cuts the core material, the core pulling mechanism being returned to its initial position by a weight. In the present application one stroke of the plunger accomplishes three results: first, it pulls the core bars; second, it cuts the core material; and, third, it empties the core material from the pipes from which the core bars have been previously pulled.

Each cutting device 36 is constructed from a round piece of metal and consists of an inner or front shank and a plurality of curved radially disposed cutters 37, formed by splitting the rear portion of the metal radially, bending the split portions outwardly and shaping and tempering the same. The front edges of the cutters 37 may be oppositely beveled to provide longitudinal cutting edges 38 to assist the cutters in plowing or cutting their way through the core material. The cutting devices are inexpensive, relatively heavy and possess great durability, being not easily broken and capable of standing rough usage. The round attaching portion or shank of the cutting device fits in the openings of a sleeve 39 with which the shackle end of the core bar is equipped, and it is detachably secured to the sleeve by a removable transverse pin 40, piercing the sleeve and the attaching portion.

As soon as the core bars have been pulled from the pipes supported by the rolls 4, the pipes are rolled down the track off the supporting rolls to a position above a track 41, arranged at a lower level than the pipe track and adapted for cars 42 to permit the latter to be arranged in a position to receive the core material as it is emptied from the pipes. The track 41 is arranged transversely of the pipe track, and in practice it extends beneath and intersects a plurality of pipe tracks, so that a single car track of this character may coöperate with all the pipe tracks of a plant. The pipes after leaving the supporting rolls are connected with the pipe pulling mechanism by a hoisting device including a pair of chains 43 and a rope or cable 44, extending upwardly from one end of the pipes to an overhead pulley 45, offset from the plane of the pipe pulling apparatus, as clearly illustrated in Fig. 1 of the drawings. The rope or cable then extends horizontally to an overhead guiding pulley 46, located above the abutment 9

of the pipe pulling apparatus. From the pulley 46 the rope or cable 44 extends downward to and beneath a lower guiding pulley 47, and is suitably secured to the cross bar 21 at the center thereof.

The core bar pulling mechanism is located at the side of the pipe track, and the spaced overhead guiding means are arranged above and at opposite sides of the said track. The pulley 46 is arranged in alinement with the core bar pulling mechanism, and the other pulley 45 supports the chains 43 at one side of the pipes, arranged upon the supporting rolls 4. The overhead guiding pulleys 45 and 46 are mounted in suitable bearing brackets 48 and 49, and the lower guiding pulley 47 is mounted in a bearing bracket 50. These pulleys are grooved to receive the rope or cable, and the chains 43, which are equipped with hooks 51, are adapted to be looped around the ends of the pipes adjacent to the bell portions thereof, and when the plunger moves upward, the pipes to which the chains are connected are raised to the inclined position, illustrated in dotted lines in Fig. 2 of the drawings for emptying or discharging the core material into the car 42. As soon as the core bars are pulled, the plunger is permitted to descend and the weight of the pipes elevated for dumping automatically returns the cables 24 and the pipe attaching means to their initial position. The cars may be handled in any preferred manner.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In an apparatus of the class described, the combination with a pipe track adapted to receive the pipes of the core bar pulling mechanism, and means for connecting a pipe or pipes with the core bar pulling mechanism for raising such pipe or pipes to an elevated position to dump the core material therefrom and for causing the elevated pipe to return the core bar pulling mechanism to its initial position after the core bars have been pulled.

2. In an apparatus of the class described, the combination with core bar pulling mechanism, of a hoisting device connected with the core bar pulling mechanism and provided with means for connecting it to a pipe, whereby when the said mechanism is operated to pull a core bar the pipe to which the hoisting mechanism is connected will be elevated to dump the core material and return the core bar pulling mechanism to its initial position.

3. In an apparatus of the class described, the combination with core bar pulling mechanism, of a hoisting device including a rope or cable connected with the core bar pulling mechanism and provided with means for

securing a pipe to it, and elevated guiding means for the rope or cable, whereby when the mechanism is operated to pull a core bar the hoisting device will raise the pipe to discharge the core material and to return said mechanism to its initial position.

4. In an apparatus of the class described, the combination with core bar pulling mechanism, of a hoisting device including a cable connected with the core bar pulling mechanism and provided with means for connecting it to a pipe, and spaced overhead guide pulleys receiving the rope or cable, one of the guide pulleys being off-set from the plane of the core bar pulling mechanism to support the pipe connecting means at one side of the core bar pulling mechanism.

5. In an apparatus of the class described, the combination with core bar pulling mechanism, of a hoisting device including a rope or cable connected at one end with the core bar pulling mechanism and provided at the other end with a plurality of chains having means for connecting them with the pipes to be emptied.

6. In an apparatus of the class described, the combination with a pipe track, of core bar pulling mechanism, and a hoisting device including a rope or cable connected with the core bar pulling mechanism and provided with means for connecting it with the pipes to be emptied, and overhead guide pulleys located above the track at opposite sides thereof and receiving the rope or cable.

7. In an apparatus of the class described, the combination with a pipe track, of core bar pulling mechanism located at one side of the track, and a hoisting device including a rope or cable and connected at one end with the core bar pulling mechanism and provided at the other with pipe engaging means, and spaced overhead guiding devices located at opposite sides of the track and receiving the rope or cable.

8. In an apparatus of the class described, the combination with a pipe track, of core bar pulling mechanism located at one side of the track, and a hoisting device including a rope or cable and connected at one end with the core bar pulling mechanism and provided at the other with pipe engaging means, and spaced overhead guiding devices located at opposite sides of the track and receiving the rope or cable, one of the guiding devices being arranged in alinement with the core bar pulling mechanism and the other being arranged out of alinement with the same to support the pipe engaging means away from the said mechanism.

9. In an apparatus of the class described, the combination of a pipe track, a car track arranged at a lower level than the pipe track and disposed transversely of the same and adapted to permit a car to be arranged be-

neath the said pipe track, core bar pulling mechanism arranged at one side of the pipe track, and a hoisting device connected with the core bar pulling mechanism and provided at one side of the pipe track with pipe engaging means adapted to enable the hoisting device to be connected with one end of a pipe to tilt the latter for emptying the core material from it.

10. In an apparatus of the class described, the combination with a pipe track, of core bar pulling mechanism located at one side of the pipe track, a car track located at a lower level than the pipe track and disposed transversely of the same, and a hoisting device connected with the core bar pulling mechanism and extending to a point above the car track and provided with means for engaging a pipe.

11. In an apparatus of the class described, the combination with a pipe track, of core bar pulling mechanism located at one side of the pipe track, a car track located at a lower level than the pipe track and disposed transversely of the same, and a hoisting device connected with the core bar pulling mechanism and extending to a point above the car track and at one side of the pipe track and provided with means for connecting it with one end of a pipe, whereby the latter will be elevated and tilted when a core bar is pulled and will return the core bar pulling mechanism to its initial position after the pulling operation has been completed.

12. In an apparatus of the class described, the combination with core bar pulling mechanism, of a cutting device consisting of a piece of metal split radially and having the severed portions bent outwardly for engaging the core material.

13. In an apparatus of the class described, the combination with core bar pulling mechanism, of a cutting device consisting of a piece of metal having a shank or attaching portion and split radially, the split portions being bent outwardly for engaging the core material.

14. In an apparatus of the class described, the combination with core bar pulling mechanism, of a cutting device consisting of a piece of metal having a shank or attaching portion and split radially, the split portions being curved outwardly and rearwardly and arranged to engage the core material.

15. In an apparatus of the class described, the combination with core bar pulling mechanism, of a cutting device consisting of a piece of metal having a shank or attaching portion and split radially, the split portions being bent outwardly and oppositely beveled at the front to provide cutting edges.

16. In an apparatus of the class described,

the combination with core bar pulling mechanism, of a cutting device consisting of a piece of metal having a shank or attaching portion and split radially, the split portions being curved outwardly and oppositely beveled at the front to provide longitudinal cutting edges.

17. In an apparatus of the class described, the combination with core bar pulling mechanism, of a cutting device provided with an attaching portion and having outwardly extending integral cutters provided with front cutting edges.

18. In an apparatus of the class described, the combination with the core bar pulling mechanism, means for connecting the same to a core bar, and separate hoisting means connecting the core bar pulling mechanism with a pipe to raise the same, whereby the weight of the pipe is utilized as a counterbalance and the core material is emptied therefrom.

19. In an apparatus of the class described, the combination with the core bar pulling mechanism, means for connecting the same to a core bar, and separate hoisting means connecting the core bar pulling mechanism with a pipe to raise the same, said hoisting means being off-set from the plane of the core bar pulling mechanism.

20. In an apparatus of the class described, the combination with means for supporting a pipe in a horizontal position for pulling the core bar, the core bar pulling mechanism, means for connecting the same to the core bar, a separate pipe support arranged at one side of the first-mentioned support, a track beneath the second pipe support on which a car is run, said second pipe support serving to receive a pipe from which the core bar has been pulled, hoisting means adapted to be connected to one or more of such pipes to elevate the same and cause the core material therein to run into the car, said hoisting device being connected to the core bar pulling mechanism, whereby the two operations of pulling the core bar from one pipe and elevating another pipe are effected by the same movement of the core bar pulling mechanism.

21. In an apparatus of the class described, the combination with core bar pulling mechanism, a core bar connected thereto and tapered from end to end and projecting from both ends of the pipe and provided with a cutting device at the smaller end.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES R. McWANE.

Witnesses:

DOUGLAS WALLACE,
J. J. SWENSON.