

March 18, 1930.

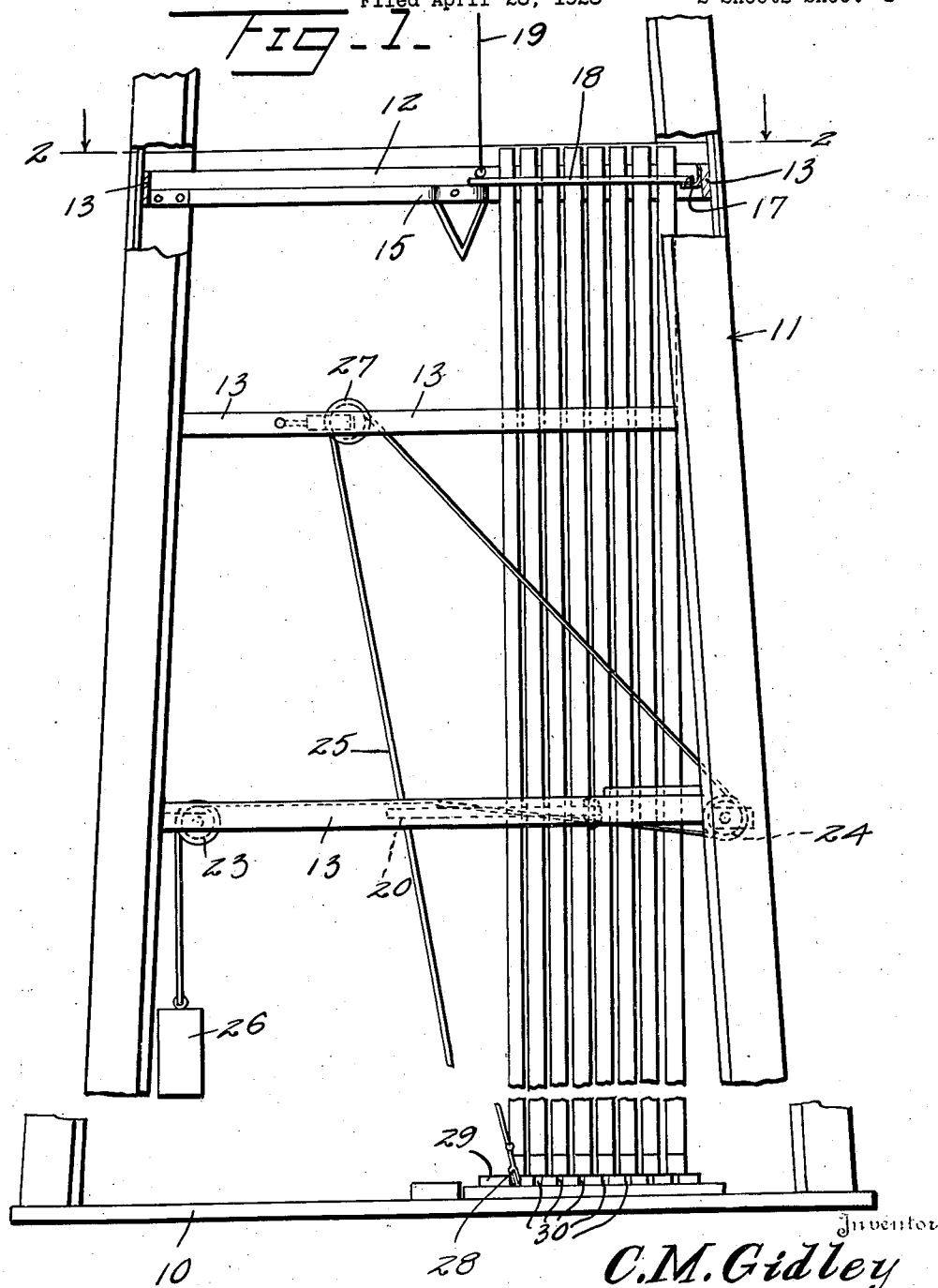
C. M. GIDLEY

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PIPE HANDLING APPARATUS FOR DERRICKS

Filed April 28, 1928

2 Sheets-Sheet 1



By *Watson E. Coleman*
Attorney

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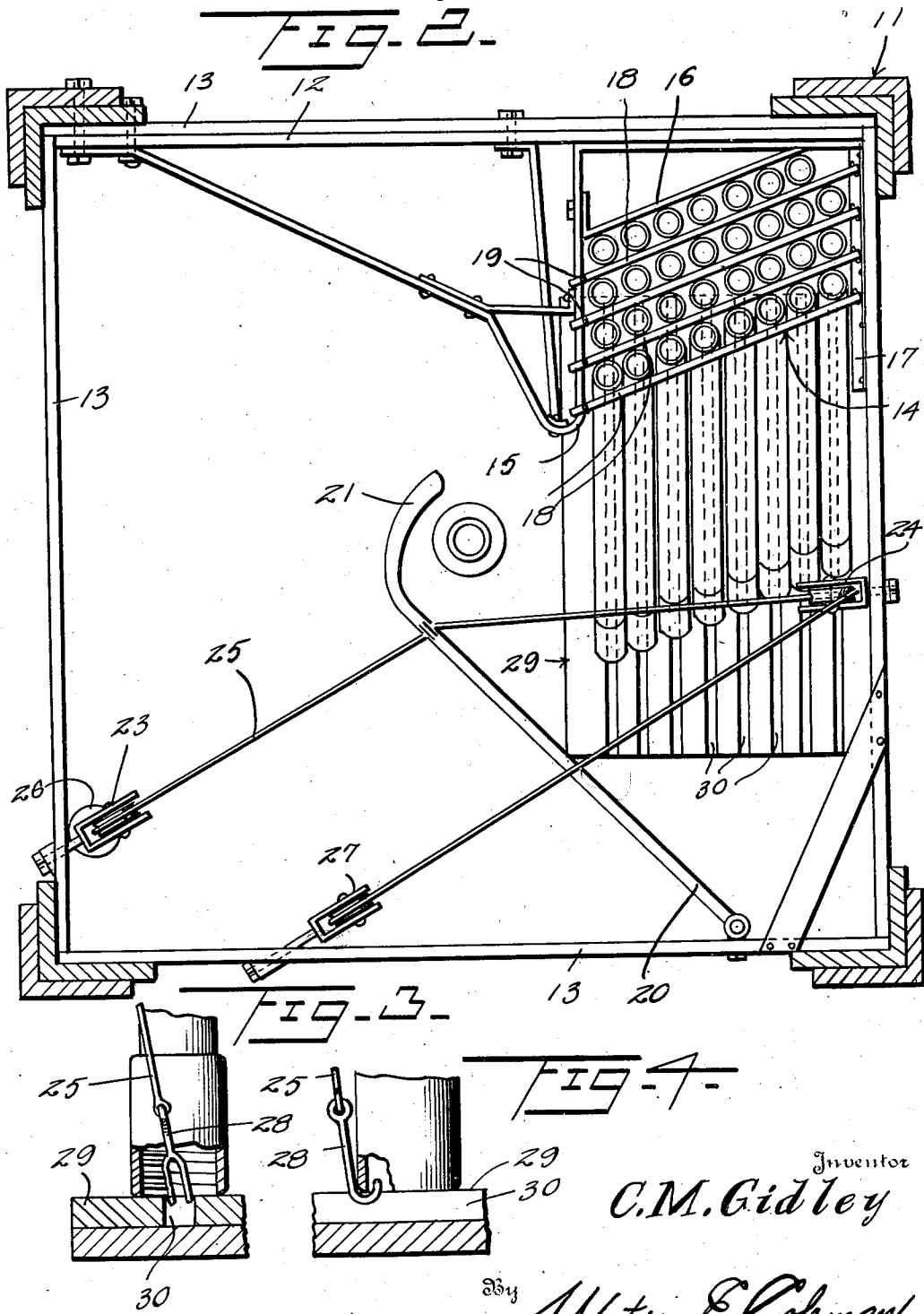
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UNITED STATES PATENT OFFICE

COLUMBUS MONROE GIDLEY, OF CORSICANA, TEXAS

PIPE-HANDLING APPARATUS FOR DERRICKS

Application filed April 28, 1928. Serial No. 273,725.

This invention relates to pipe handling apparatus for derricks and more particularly to a means for assisting in handling long lengths of drill pipe or tubing which, as they are drawn from the well, are stacked in the interior of the derrick.

An important object of the invention is to provide means for automatically directing the upper ends of such pipe sections into the rack provided for their reception at the fourble board of the derrick, thus eliminating the necessity for an operator at the fourble board, particularly when such mechanism is employed in combination with an elevator such as disclosed in my pending application, Serial No. 268,231, filed April 7, 1928, for elevators.

A further and more specific object of the invention is to provide means adjacent the upper end of the derrick for engaging the upper ends of such pipe sections and causing them to swing transversely of the derrick to engage in the rack provided for their reception.

A further and more specific object of the invention is to provide a means of this character for which the operating power is derived from the pipe section.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a side elevation partially broken away of a derrick embodying pipe handling mechanism constructed in accordance with my invention;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a detail view showing the manner of landing the pipe on the platform;

Figure 4 is a sectional view at right angles to the view of Figure 3.

Referring now more particularly to the drawings, the numeral 10 generally designates the derrick floor, 11 the derrick structure proper, 12 the fourble board disposed adjacent the top of the derrick and 13 the derrick girts. In accordance with my invention, I provide at one corner of the derrick and at the fourble board a rack, generally

designated at 14. This rack includes a suitably braced horizontal arm 15 projecting transversely of the derrick to one side of the center thereof and supported from the fourble board. To this arm adjacent its inner end is connected the outer end of a rack element 16, the opposite end of which extends to the approximate corner of the derrick and forms the outer wall of the rack 14. The fourble board has secured thereto an angle iron frame 17 forming a wall for the rack opposing the arm 15. To this angle iron are pivotally secured a plurality of separator arms 18, the inner ends of which are adapted to rest upon the arm 15.

These separator arms parallel the angular wall 16 and are controllable from the base of the derrick through pulley lines 19. To a girt 13 spaced about eight feet below the fourble board and at the opposite side of the derrick but at the same side of the center of the derrick, I pivot an arm 20, which is of a length to extend slightly beyond the center of the derrick and having its outer end hooked, as indicated at 21. Upon the girts at opposite sides of this arm, I mount pulleys 23 and 24. A flexible element 25 having secured thereto a counterweight 26 is passed through the pulley 23 secured to the arm 21 adjacent its outer end, then passed through the pulley 24 and finally led to the lower end of the derrick, preferably extending in its passage over a third pulley 27 located upon a girt 13 above or below the level of the arm. The lower end of this flexible element is provided with a hook 28 to engage in the lower end of a string.

Upon the floor of the derrick, I provide a landing platform 29 which is preferably longitudinally grooved, as indicated at 30. This platform is arranged upon the floor of the derrick at the same side of the center of the derrick as the rack 14 and arm 20 but is spaced from the derrick side to which the arm 15 of the rack is secured, so that the pipes having their lower ends upon this platform and their upper ends in engagement with the rack 14 will be disposed at an incline.

In removing pipe from a well, three or four sections of the pipe are withdrawn at a time

and these sections unscrewed from the remaining pipe and are then lowered until their bases rest upon the platform. In employing my invention before the pipe is lowered to the platform, the hook 28 is engaged with the lower end thereof.

Therefore, as the pipe is lowered, the arm 20 will be swung horizontally of the upper end of the derrick, engaging the upper end of the pipe and directing the same into the rack 14. In landing the pipe upon the platform, care is taken that the hook aligns with one of the grooves so that the hook may be removed to permit the arm to swing back into position through its counterweight. This arm can be disposed at any particular level but is preferably arranged at a lower level than the fourble board so that it will not interfere with the operation of an elevator such as described in the co-pending application hereinbefore mentioned. Such an elevator is constructed to move upwardly or downwardly upon the pipe to assume either a grasping position at the upper end of the pipe after being set about the pipe from the floor or to permit the elevator to move downwardly to the floor, so that it is accessible to a workman. As in landing the pipe in the rack once it is started into the rack, the support afforded by the elevator is released and rapidly slacked away, positioning the arm at a point spaced below the fourble board allows time for this arm to swing out of the path of the elevator during its return trip down the pipe.

The construction recited is of further benefit in connection with such an elevator in that a casing carrier may be engaged with the pipe to shift the same upon the platform to a point where it may be conveniently engaged by the elevator.

Since the construction hereinbefore set forth is capable of a certain range of change and modification without materially departing from the spirit of the invention, I do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In racking apparatus for racking pipe in oil well derricks, a platform upon the derrick floor for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a horizontally swinging arm adjacent the upper end of the derrick, and means for connecting said arm with the lower end of a pipe section to cause said arm to be horizontally swung as the pipe is lowered to place the same upon the platform, said arm in its swinging movement engaging the upper end of the pipe to direct the same into said rack.

2. In racking apparatus for racking pipe in oil well derricks, a platform upon the derrick floor for the reception of the lower

end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a horizontally swinging arm adjacent the upper end of the derrick, means for connecting said arm with the lower end of a pipe section to cause said arm to be horizontally swung as the pipe is lowered to place the same upon the platform, said arm in its swinging movement engaging the upper end of the pipe to direct the same into said rack, and means normally maintaining said arm at the opposite side of the center of the derrick from said platform.

3. In racking apparatus for racking pipe in oil well derricks, a platform upon the derrick floor for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a horizontally swinging arm adjacent the upper end of the derrick, a flexible element connected with the arm and having in its lower end means for engaging the lower end of a pipe section and guides for said flexible element whereby a downward pull upon the flexible element causes said arm to swing horizontally whereby when said means is engaged with the lower end of a pipe section and the pipe section is lowered the arm shifts horizontally to engage the upper end of the pipe section and direct the same into said rack.

4. In racking apparatus for racking pipe in oil well derricks, a platform upon the derrick floor for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a horizontally swinging arm adjacent the upper end of the derrick, a flexible element connected with the arm and having in its lower end means for engaging the lower end of a pipe section, guides for said flexible element whereby a downward pull upon the flexible element causes said arm to swing horizontally whereby when said means is engaged with the lower end of a pipe section and the pipe section is lowered the arm shifts horizontally to engage the upper end of the pipe section and direct the same into said rack, and means normally maintaining said arm at the opposite side of the center of the derrick from the rack.

5. In racking apparatus for racking pipe in oil well derricks, a platform upon the derrick floor for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a thrust element at the upper end of the derrick and shiftable toward and away from the rack, a flexible element connected with said thrust element and adapted for engagement with the lower end of a pipe section, a pull upon said flexible element shifting the thrust member toward the rack.

6. In racking apparatus for racking pipe in oil well derricks, a platform upon the der-

rick floor for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a thrust element at the upper end of the derrick and shiftable toward and away from the rack, a flexible element connected with said thrust element and adapted for engagement with the lower end of a pipe section, a pull upon said flexible element shifting the thrust member toward the rack, and means normally shifting the thrust member in the opposite direction.

7. In racking apparatus for racking pipe in oil well derricks, a support for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a thrust member operable to engage and direct the upper end of a section of pipe from the center of the derrick to said rack, and means for operatively connecting said thrust member to the pipe to be operated thereby as the pipe is lowered.

8. In racking apparatus for racking pipe in oil well derricks, a platform upon the derrick floor for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a thrust element at the upper end of the derrick and shiftable toward and away from the rack, a flexible element connected with said thrust element, a pull upon said flexible element shifting the thrust member toward the rack.

9. In racking apparatus for racking pipe in oil well derricks, a platform upon the derrick floor for the reception of the lower end of the pipe, a rack at the upper end of the derrick for the reception of the upper end of the pipe, a thrust element at the upper end of the derrick and shiftable toward and away from the rack, a flexible element connected with said thrust element, a pull upon said flexible element shifting the thrust member toward the rack, and means normally shifting the thrust member in the opposite direction.

In testimony whereof I hereunto affix my signature.

COLUMBUS MONROE GIDLEY.