



# UNITED STATES PATENT OFFICE.

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## PIPE-GRAB.

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*To all whom it may concern:*

Be it known that I, FRED J. LUKINS, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Pipe-Grabs, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to well-sinking apparatus, and has for its object to provide certain improvements in tools known as "pipe-grabs" employed for taking out pipes that have been broken off or dropped into tubular or Artesian wells.

In sinking a well when the boring-tool is engaged with a part of the pipe that is broken off and it cannot be lifted, which frequently happens, it is necessary to employ another tool for the removal of the broken pipe. Such tool is called a "pipe-grab" and is arranged to grapple the broken pipe, so that it can be removed to permit further sinking of the well.

My invention has for its object to provide an improved pipe-grab constructed and arranged so that it may be readily inserted in a well and after being lowered to the proper point may be caused to firmly grip the inside of the pipe to be removed, so that such pipe may be withdrawn with the tool.

A further object is to provide means by which the pipe-grab may be caused to release the pipe to be removed, as is sometimes necessary where such pipe is so firmly held in the well as to prevent its removal. By providing for releasing the pipe-grab when necessary I am enabled to save the tool where the effort to remove the broken pipe or other obstruction is futile.

I accomplish these objects as hereinafter described and as illustrated in the accompanying drawings.

What I regard as new is set forth in the claims.

In the accompanying drawings, Figure 1 is a partial vertical section of a piece of pipe, illustrating my improved tool in elevation. Fig. 2 is a vertical section of the parts shown in Fig. 1. Fig. 3 is a horizontal section on line 3 3 of Fig. 2. Fig. 4 is a horizontal sec-

tion on line 4 4 of Fig. 2, and Fig. 5 is a horizontal section on line 5 5 of Fig. 2.

Referring to the drawings, 6 indicates the pipe to be removed, which in practice is at a greater or less depth in the well.

7 indicates a tube which supports certain parts of the tool.

8 indicates a plug in the lower end of the tube 7, as shown in Fig. 2, said plug being preferably screwed into the lower end of the tube 7, so that it may be removed at pleasure.

9 indicates what may be termed a "spreader," which, as illustrated in Fig. 2, is provided with a tapered portion at its lower end and a stem at its upper end, the latter being secured to the plug 8. As shown, the upper end of said stem is screw-threaded, so that it may be separated from the plug 8, if desired; but it may be secured thereto in any suitable manner. From an inspection of Fig. 4 it will be seen that the stem 10, as illustrated, is circular in cross-section, while the tapered head 11 at the lower end of the spreader is provided with flattened sides *a* and is preferably quadrilateral, so as to accommodate four wedges, as will be hereinafter described. The number of sides of the tapered portion 11 may, however, be varied, and, if desired, the stem 10 may be non-circular in cross-section. The sides of the head 11 extend gradually inward and upward until they merge in the circular stem 10. I prefer also to provide the head 11 with a pointed lower end 12, as shown in Fig. 2.

13 indicates wedges which are provided with inclined inner surfaces adapted to bear against the sides of the spreader-head 11, as shown in Figs. 2 and 5. The outer surfaces of the wedges 13 are roughened or serrated, as shown at 14 in Fig. 2, so as to adapt them to engage the inner surface of the pipe to be removed, and they are also arranged at a sufficient angle to the inner faces of the wedges to cause them to lie substantially parallel with the inner surface of the pipe when in operative position. Obviously when the wedges are forced down upon the spreader-head 11 or the spreader-head is drawn up between the wedges the wedges are forced out into engage-

ment with the inner surface of the pipe. The vertical position of the wedges 13 is controlled from an operating-rod 15, which extends down through the tube 7 and is connected with said wedges by rods 16, (shown in Fig. 2,) so that by means of said rod the position of the wedges or gripping means with reference to the spreader may be adjusted. In the construction illustrated the rod 15 is provided at its lower end with a head 17, in which are formed recesses 18, adapted to receive nuts 19, screwed upon the upper ends of the rods 16, which enter the recesses 18 from below, passing through the under portion of the head 17, as shown in Fig. 2. The rods 16 pass through suitable passages in the plug 8 into the upper portions of the different wedges 13, respectively, as shown in Figs. 2 and 5. The wedges 13 are also provided with recesses 20, which receive pins 21, secured in the lower ends of the rods 16, the wedges 13 being thus secured upon the lower ends of the rods 16. Instead of using the pins 21 to secure the wedges to the rods 16 the connection may be made with nuts, as shown at the upper ends of said rods. The passages through which the rods 16 pass into the recesses 20 are large enough, so that the wedges 13 may rock slightly upon the pins 21. Consequently they may adapt themselves properly to their work. The connection of the rods 16 with the head 17 at their upper ends is also loose, and the passages through the plug 8 are of somewhat greater diameter than the rods 16, so that slight lateral movement of said rods is permitted. In operation when the tube 7 is lowered into the pipe to be removed the wedges slide up far enough along the stem 10 of the spreader to permit them to pass freely into the well and into the pipe to be withdrawn. After they have been lowered to place by means of the tube 7 the spreader is drawn up between the wedges or the wedges are forced down upon the spreader-head, as may be desired, thereby forcing the wedges firmly into engagement with the pipe to be withdrawn. The tube 7 is then hoisted, the power applied thereto serving not only to raise the pipe to be withdrawn, but also to force the wedges more firmly into engagement therewith, and the greater the pull upon the tube 7 the more firmly

are the wedges forced outward. If for any reason the pipe cannot be withdrawn and it is desired to release and remove the grabbing-tool by forcing down the spreader 9 by means of the tube 7 and attaching and pulling up on the rod 15, the wedges are permitted to move inward, releasing their grip upon the pipe.

It will be understood, of course, that the number of wedges employed may be varied, one or more being employed, as may seem desirable. Furthermore, my invention is not restricted to the specific details of the construction illustrated and described, except in so far as such details are particularly claimed.

That which I regard as my invention, and desire to secure by Letters Patent, is—

1. A pipe-grab, comprising a spreader composed of a tapered head and a stem, a tube connected with said stem, a rod lying within said tube and moving longitudinally thereof, a plurality of rods connected with said first-mentioned rod and extending below said tube, and wedges carried by said rods and arranged to be operated by said spreader-head to grip the pipe to be removed, substantially as described.

2. A pipe-grab, comprising a spreader composed of a tapered head and a stem, a tube connected with said stem, a rod lying within said tube and moving longitudinally thereof, a plurality of rods connected with said first-mentioned rod and extending below said tube, and wedges movably connected to the lower ends of said rods and arranged to be operated by said spreader-head to grip the pipe to be removed, substantially as described.

3. A pipe-grab, comprising a spreader composed of a tapered head and a stem, a tube connected with said stem, a rod lying within said tube and moving longitudinally thereof, a plurality of laterally-movable rods connected with said first-mentioned rod and extending below said tube, and wedges carried by said rods and arranged to be operated by said spreader-head to grip the pipe to be removed, substantially as described.

FRED J. LUKINS.

Witnesses:

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