

Oct. 14, 1930.

S. M. PALM ET AL

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APPARATUS FOR PULLING CABLES THROUGH CONDUITS

Filed June 25, 1928

3 Sheets-Sheet 1

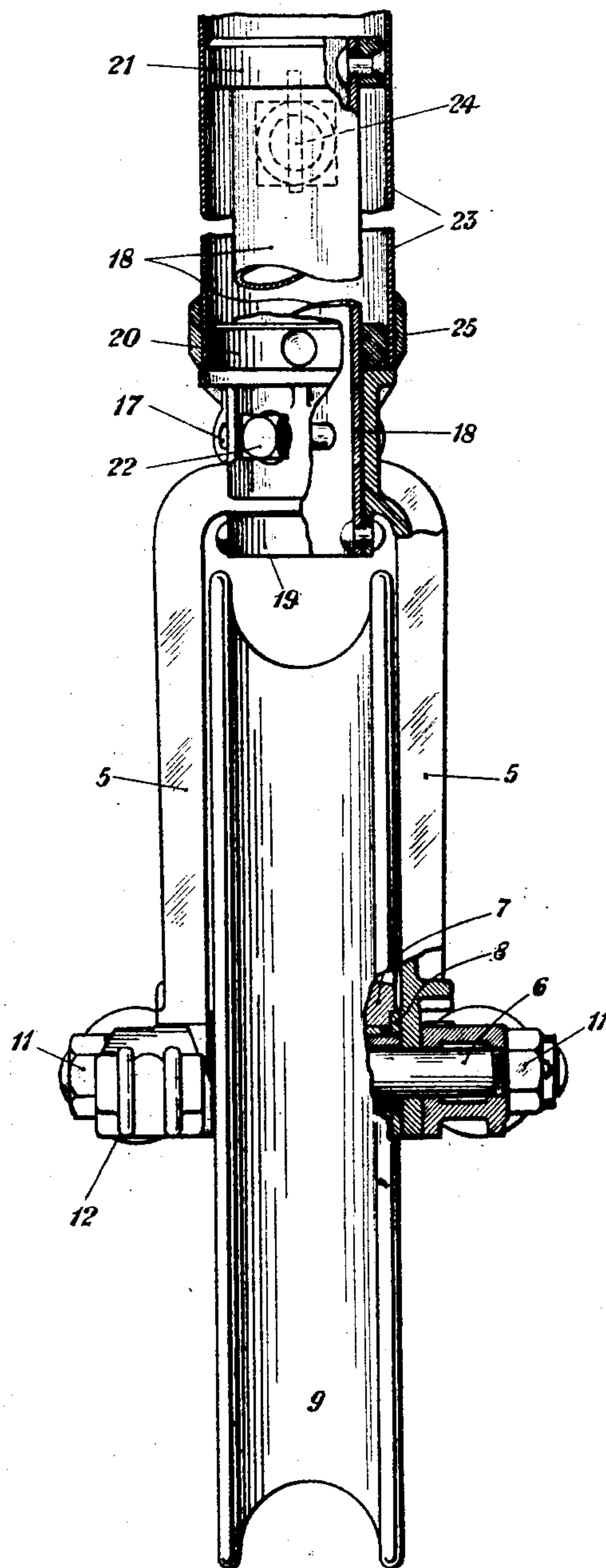


Fig. 1

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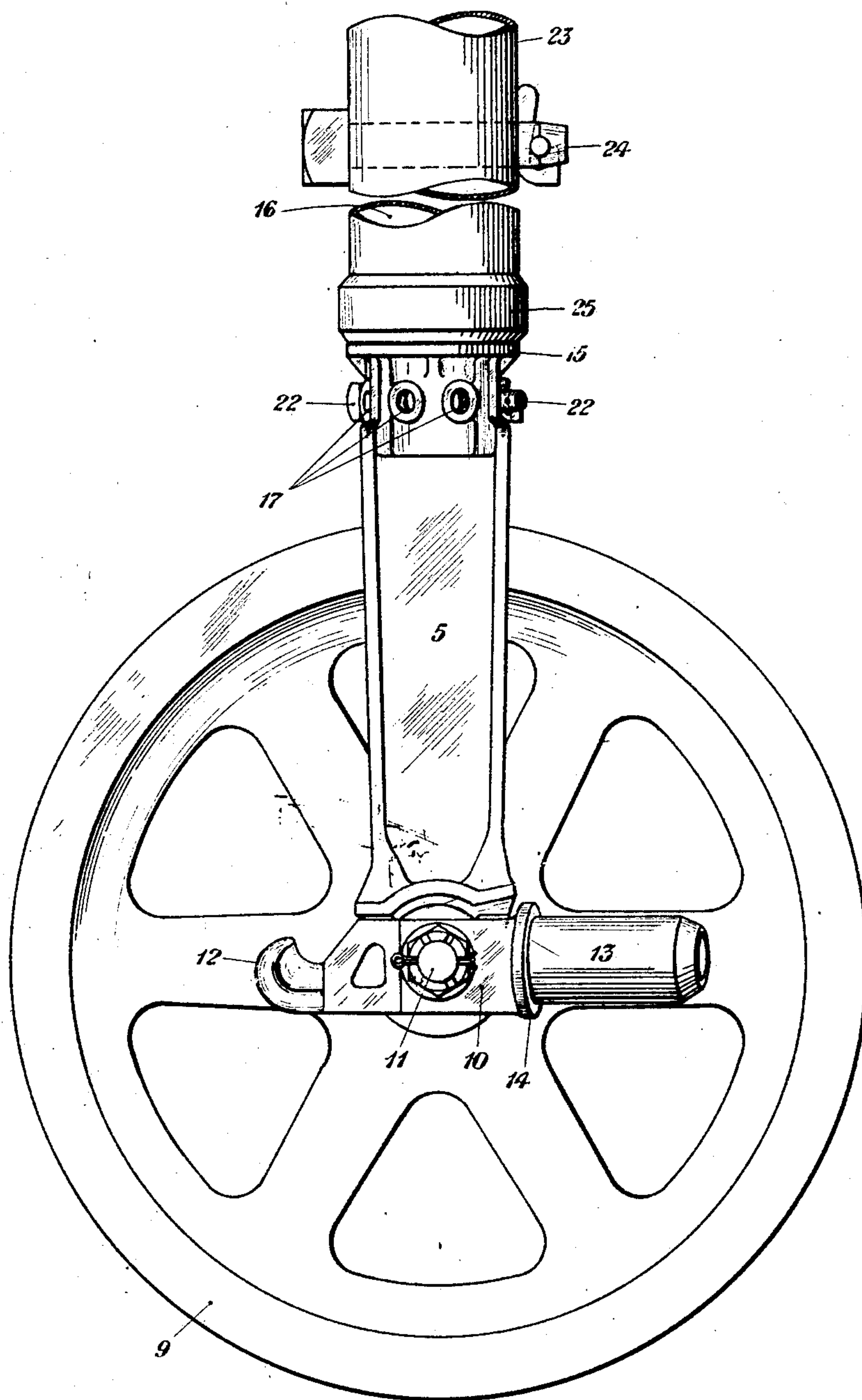


Fig. 2

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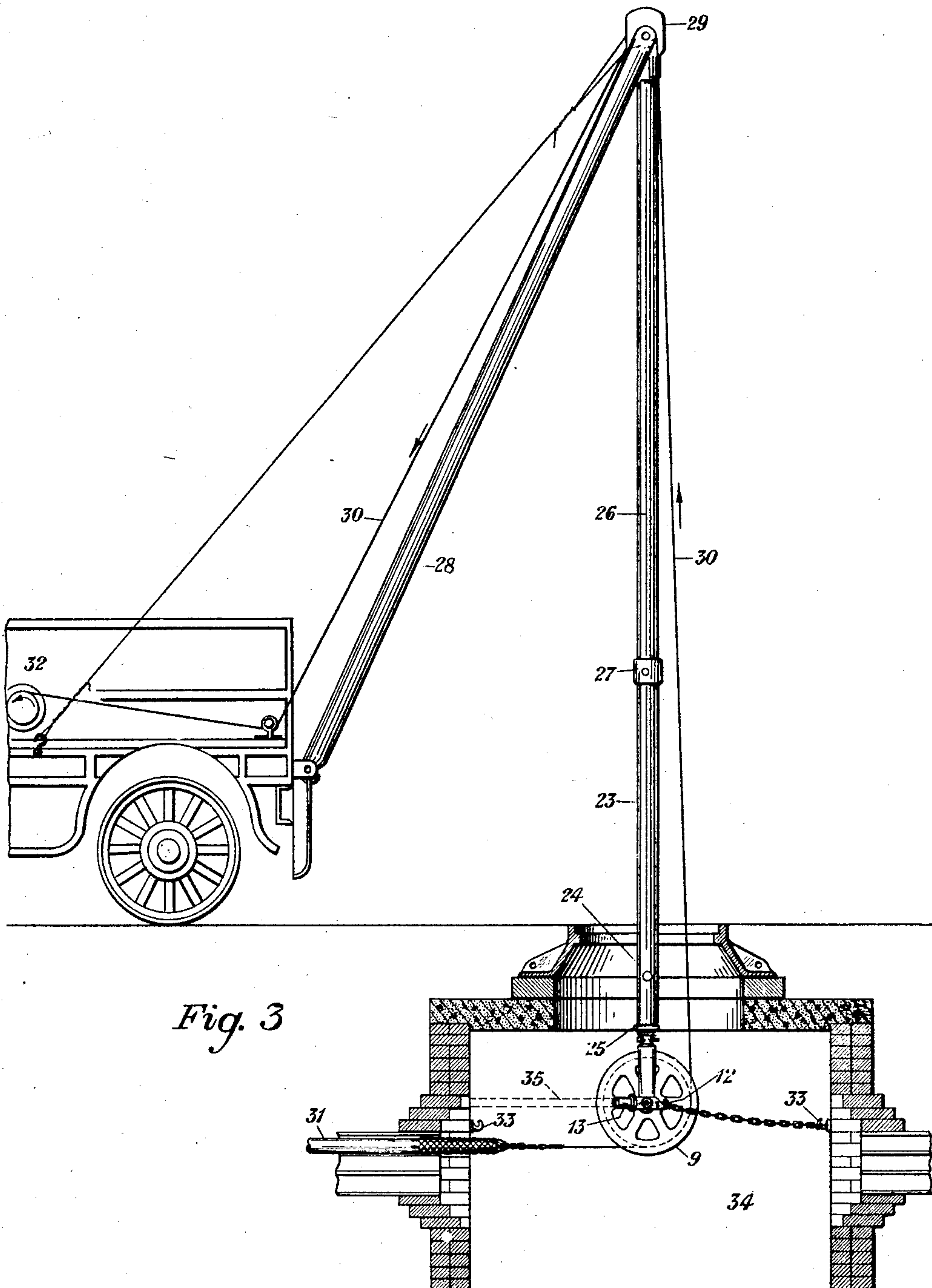
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UNITED STATES PATENT OFFICE

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APPARATUS FOR PULLING CABLES THROUGH CONDUITS

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In underground cable practice it has been formerly the custom to use a series of uprights in manholes in connection with the operation of pulling cables through the conduits from one manhole to another. Some of the uprights carry sheaves over which the cable is drawn during the operation of placing the cables in the conduits, and other of the uprights act as supports. Each of the uprights is firmly secured to the interior of the manholes during the cable pulling operations and are removed therefrom after such operations are completed. Considerable time and money are expended in placing and removing these structures from the manholes.

It is, therefore, one of the objects of this invention to provide apparatus which can be readily and quickly installed in manholes for pulling cables or the like through the conduits interconnecting the manholes.

Another object consists in the provision of such apparatus which does not require it to be set up and dismantled in connection with its operation at each manhole but can be repeatedly used in successive manholes.

A further object consists in the provision of apparatus of the above type which is simple and comparatively inexpensive.

These and further objects will be apparent from the following description, when considered in connection with the accompanying drawings in which one embodiment of the invention is illustrated.

Referring to the drawings, Figure 1 is an end elevation of that portion of the improved arrangement which extends into a manhole; Fig. 2 is a side elevation of Fig. 1, and Fig. 3 shows the apparatus in the position it assumes at a manhole in the operation of pulling cables through conduits.

The portion of the apparatus which extends into a manhole comprises a pair of forked members 5, 5 which may be composed of some such material as steel casting. The lower portions of the members 5, 5 are provided with coinciding openings in which a shaft 6 is suitably journaled in a bushing 7. Thrust washers 8 may be also provided for said shaft and may be positioned on the in-

ner sides of the forked members. A sheave 9 is mounted on the shaft 6, and one part thereof extends upwardly between the forked members, while the lower part of the sheave lies in an exposed position. The shaft 6 extends beyond the sides of the forked members 5, 5 and a pair of chain and brace holders 10, 10 is mounted thereon. These members are maintained in position on the shaft and against the sides of the forked members 5, 5 by castellated nuts 11, 11 which engage the threaded ends of said shaft. The members 10, 10 are similarly arranged with respect to each other on the shaft 6 in a horizontal position. A flange extending from each of the forked members 5 may be provided to abut the upper edge of the members 10 to prevent their rotation. A hook member 12 is provided on one end of each of the members 10, 10 for the purpose of holding an end of a chain, and each of the other ends of said members is provided with a tubular portion 13 for holding a pipe. The entrance of such pipe into the tubular portion 13 is limited by the collar 14. The chain and pipe connections are used to hold the sheave 9 against displacement in the manhole during the cable pulling operations, as will be presently described.

The forked members 5, 5 are connected with a head member 15 which is provided with a central opening 16 therethrough, and a series of side openings 17. A tubular member 18 is positioned within the central opening in such manner that the head member is adapted to rotate thereon. The tubular member 18 extends beneath the shoulders of the forked members 5, 5 and a collar 19 is suitably affixed thereto by rivets or the like. The tubular member is also provided with a central collar 20 and an upper collar 21, each of which is suitably affixed thereto. The head member 15 is journaled on the tubular member 18 between the collars 19 and 20. The tubular member 18 is provided with openings through its side walls corresponding to the openings 17 in the head member, and a pin 22 is adapted to be inserted through the openings in each of these members. The sheave 9 may be thus rotated to any desired position

and fixed in such position by the insertion of the pin 22 through said openings.

A tubular extension 23 in the middle leg of a pole derrick is connected to the tubular member 18 by means of a pin 24. This pin passes through openings provided in the extension 23 and the tubular member 18 and securely connects these members together. The tubular extension 23 is provided with a base 25 which rests on the top of the head member 15, and the collars 20 and 21 carried by the member 18 serve as spacing means to prevent lateral movement of the extension. The extension 23 is attached to the middle leg 26 of the derrick by a pinned collar 27 which interconnects these elements.

The derrick is shown as being carried by a truck and may be of the usual tripod character having two of its legs 28 hinged to the rear part of said truck. A sheave 29 is positioned at the meeting points of the vertical leg 26 and the hinged supporting legs 28. A line 30 passes over the sheave 29 and is connected to a cable 31 which is to be drawn through the duct of the underground conduit. A winch 32, positioned on the truck, furnishes the pulling power required by winding the line 30 thereon after it passes through a snatch block positioned on a rear corner of the truck.

The sheave 9, owing to the rotatable character of its supports, as previously outlined, may be held at various angles in the manhole, as may be required, to suit the position of the truck adjacent the manhole and the conduit ducts interconnecting the manholes. Pulling-in irons 33, embedded in the walls of the manhole 34 serve to hold the sheave in a desired position in the manhole by chains attached to the hook 12. As an alternate means of holding the sheave in the desired position the braces 35 may extend from the tubular pipe holder 13 to the wall of the manhole, as shown by dotted lines in Fig. 3.

In the operation of the improved arrangement, after the derrick is set up on a truck, the tubular portion of attachment which is to be positioned in the manhole, is placed inside the lower portion of the middle leg of the pole derrick. The connecting pin is then inserted through these elements to keep them together. The truck carrying the derrick is then manoeuvred so that when the pole derrick leg is lowered, it will enter the manhole. The height of the derrick is adjusted so that the bottom of the sheave will line up with the duct through which the cable is to be pulled. The frame comprising the forked arms is turned on the tubular member on which it is journaled so that the sheave will point toward the duct through which the cable is to be pulled. The block setting bolt is then inserted in the holes of the tubular member and head to maintain this position of the sheave. The pipe braces may be now placed in the

pipe brace holder, and the length of such pipe braces are adjusted so that they will engage the wall of the manhole and maintain the sheave from lateral displacement. The winch line is now passed over the sheave in the manhole and attached to the fish line and pulled through to the other manhole, and there attached to the cable to be pulled through the duct of the conduit. The winch is then operated in a forward speed causing its line to be wound thereon, so that as the winding progresses the cable will be pulled through the conduit in an obvious manner.

What is claimed is:

In combination with a derrick adapted to be mounted adjacent a manhole and having a vertical leg, of a forked bracket carrying a sheave and mounted upon the vertical leg so as to be lowered thereby into the manhole, means for connecting the forked bracket in rotatable relation with the vertical leg to permit the sheave to be turned to a desired position in the manhole, means for locking the bracket in a desired position, means to prevent displacement of the sheave in the manhole, and a rope extending over a pulley at the top of the derrick and through said sheave adapted to be attached to a cable in a conduit to pull the cable therethrough.

In testimony whereof, we have signed our names to this specification this 15th day of June, 1928.

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