May 17, 1949. B. D. MARKS ET AL 2,470,255

PIPE LINE RECOVERY DEVICE

Filed March 24, 1947

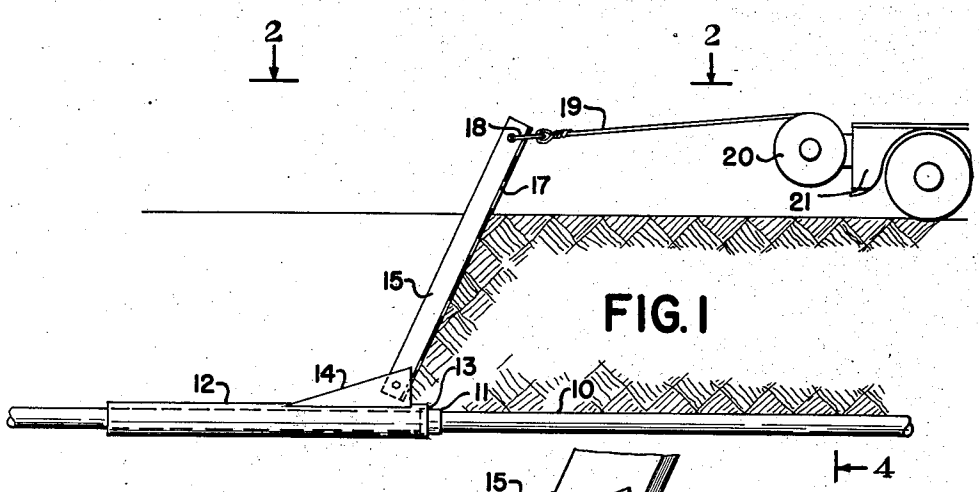



FIG. 1

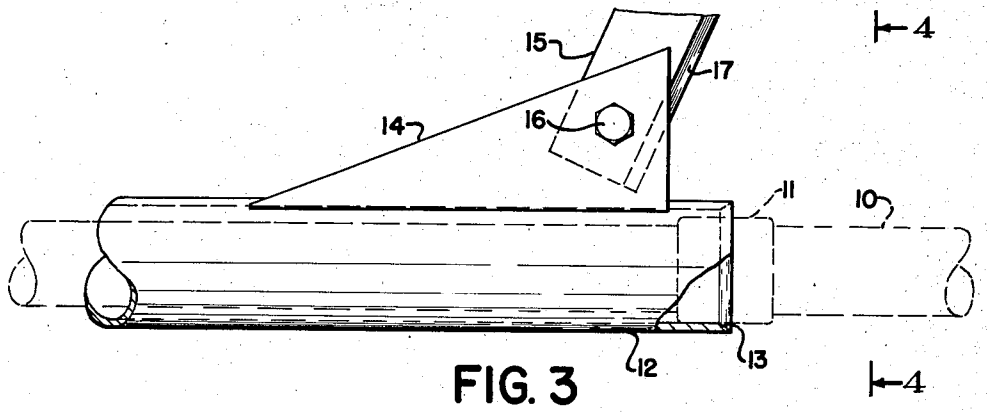



FIG. 3

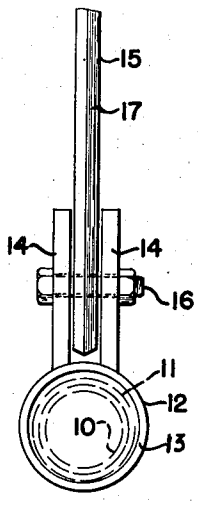



FIG. 4

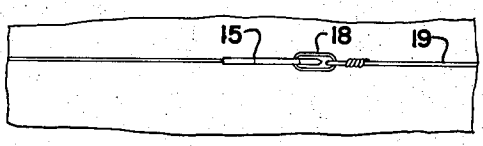



FIG. 2

B. D. MARKS
O. E. DILLON
*INVENTORS*

*BY*

R. Werlin

ATTORNEY

Patented May 17, 1949

2,470,255

# UNITED STATES PATENT OFFICE

2,470,255

## PIPE-LINE RECOVERY DEVICE

Ben D. Marks and Orel Elton Dillon,
Corpus Christi, Tex.

Application March 24, 1947, Serial No. 736,696

1 Claim. (Cl. 37—1)

1

This invention relates to a device for unearthing pipe lines, and has for its principal object the removal of pipe lines buried in the ground without the necessity for the removal of the over-lying earth.

An important object of the present invention is to provide a recovery device which is very simple in construction and which is highly efficient in operation, by which the recovery of buried pipe lines may be accomplished very rapidly and with minimum expense.

Other and more specific objects and advantages of this invention will become apparent from the following detailed description when read in conjunction with the accompanying drawings which illustrate a useful embodiment in accordance with this invention.

In the drawings:

Fig. 1 is a side view of the pipe recovery device in accordance with this invention showing the same in use;

Fig. 2 is a view looking down on the surface of the ground to illustrate the only portions of the device which are visible during the pipe recovery operation shown in Fig. 1;

Fig. 3 is an enlarged side elevation of a portion of the pipe recovery device, showing some of the details thereof; and

Fig. 4 is an end elevation along line 4—4 of Fig. 3.

Referring to the drawings, a pipe line, indicated by the numeral 10, is shown buried below the surface of the ground. Such pipe lines may be buried at depths ranging to several feet and normally will be made up of pipe sections coupled together in various ways, as by means of collars 11, or by welding the ends of adjoining pipe sections. Shown in position on the pipe is the recovery device in accordance with this invention which consists of a tubular sleeve 12 which surrounds the pipe, having an internal diameter which is somewhat greater than the external diameter of the collars 11 or other connections employed in coupling the pipe sections. The forward end of sleeve 12 is internally bevelled at 13 to form a sharp circular cutting edge, which may be hardened in any suitable manner, or faced with a suitable hard material, such as tungsten carbide, Stellite, or the like, which will resist abrasion while maintaining the sharpness of the cutting edge. The internal bevelling forms an annular rearwardly and upwardly sloping surface which will serve to guide the projections, such as are formed by the edges of collars 11 or welding beads, into the interior of sleeve 12 as it is moved

2

over the pipe line in the manner to be described hereinafter. Rigidly mounted on the upper surface of sleeve 12 near its forward end, is a pair of upstanding laterally spaced, parallel plate members 14—14. As best shown in Figures 1 and 3, the leading edges of the plate members 14—14 lie in a plane extending at approximately a right angle to the longitudinal axis of the tubular sleeve 12. A metal blade member 15, of generally flat rectangular shape, has one end pivotally connected between members 14—14 by means of a bolt 16 which passes transversely through the plate members and the end of the blade member. Blade member 15 is of such length as to extend, when in use, from the top of sleeve 12 to a point somewhat above the surface of the ground. The length of blade member 15 will, of course, be varied to conform to the depth at which pipe line 10 is buried. The forward edge 17 of blade member 15 is sharpened throughout its length and suitably hardened, as by facing it with a hard abrasion-resisting material of the kind previously mentioned. The thickness and width of blade member 15 are generally sufficient only to make the blade reasonably rigid and resistant to bending or twisting in operation. A link 18 is pivotally attached to the upper end of blade member 15 for attachment of a pulling cable 19 which extends forwardly to a suitable source of power, such as a power driven winch 20, shown mounted on the end of a truck 21 which is movable over the surface of the ground along the pipe line. Cable 19 may, of course, be connected to the draw-bar of a tractor or to any other suitable source of power adapted to apply a strong pulling force to the cable.

The recovery apparatus is employed to recover buried pipe in the following manner: A hole, commonly termed a "bell hole" (not shown), will be dug to uncover a portion of the pipe line at which the recovery operations are to be begun and the pipe will be cut to provide a free end over which sleeve 12 will be slipped with the bevelled end 13 facing in the direction in which the sleeve is to be moved. Blade member 15 will extend above the surface of the ground having its cutting edge 17 likewise facing in the direction of movement of the recovery apparatus. Cable 19 will be connected to the upper end of blade member 15 and the winch 20, to which cable 19 extends, will be set in operation to draw blade member 15 through the ground, or the truck or tractor will be moved forwardly to apply the required pulling force to cable 19. Blade member 15, because of its relatively thin flat form and sharp-

ened leading edge will cut through the earth overlying the pipe line under the pull applied through cable 19 by the power source. By virtue of its pivoted connection to sleeve 12, blade member 15 will slope forwardly in the direction of the applied pulling force to produce a shearing action which will greatly assist the blade edge to cut through the earth. The pull applied to blade member 15 will, of course, be transmitted to sleeve 12 which will be drawn over the outer surface of pipe line 10 and will cut an annular channel concentrically about the pipe line through the surrounding earth, displacing the latter annularly from the surface of the pipe line. When sleeve 12 has progressed a suitable distance over pipe line 10, another bell hole (not shown) will be dug to uncover the pipe line adjacent the point which the recovery device has attained and the pipe line will again be cut. The severed section of the pipe line may then be withdrawn bodily longitudinally out of the annular channel cut by sleeve 12 through either of the bell holes. This may be done by attaching cable 19 to one of the ends of the pipe and using the same power source previously used for pulling the recovery apparatus over the pipe line, the pipe will be pulled out of the ground. An independent power source may be used for this purpose if desired.

With the recovery apparatus described, buried pipe lines may be easily and quickly removed from the ground without removing any of the overburden, except of course, such as is removed in digging the bell holes. The stripping of the pipe can be performed as rapidly as the source of pulling power is moved over the ground. By the use of a single blade member of the thin knife-like form described, only a relatively small proportion of the total power applied will need to be expended in drawing blade member 15 through the earth, as no earth is removed by the blade member which merely cuts a thin slit through the earth as it is drawn forwardly. Consequently, the major proportion of the applied power will be exerted through blade member 15 to draw sleeve 12 over the pipe line. The sharp edge 17 of the blade member will permit it to cut easily through tree roots and other vegetation commonly present in the over-burden above the pipe line. Although such overburden will be material which was used to back-fill the pipe trench when the pipe line was originally laid and may therefore, not be quite so dense as the earth formations adjacent the original pipe trench, such material will often become quite dense and hard-packed, particularly if it has been in place for a number of years as is frequently the case. Nevertheless, even in the latter event, the recovery device in accordance with this invention will be able to cut through such dense materials with relative ease and rapidity.

Pipe lines of various diameters may be recovered by use of the device in accordance with this invention, it being necessary only to vary the diameter of sleeve 12 to correspond with the diameter of the pipe to be recovered. In general, the inside diameter of sleeve member 12 will be made about one inch greater than the greatest external diameter of the pipe line on which it is



to be used. This difference may be varied somewhat depending on operational conditions. For example, if the overburden is sandy, the sleeve may be made somewhat larger in diameter because of the tendency of sand to pack. Where the overburden is a gravelly material smaller clearances may be preferable to prevent admittance of relatively large pebbles to the interior of the sleeve. The length of sleeve 12 will likewise be subject to variation, depending upon conditions encountered. Generally, the length of sleeve 12 will be great enough to prevent its binding on the pipeline as it is drawn over the line.

As indicated above, blade member 15 will generally be of such thickness and width so that it will be substantially rigid in use. In most cases, this result can be obtained by means of a blade ranging from one-half to three-quarters of an inch in thickness and from about four to twelve inches in width, the length, as indicated, being such as may be required to extend from its point of connection to sleeve 12 to above the surface of the ground when in use.

It will be understood that other alterations and changes may be made in the details of the described recovery apparatus within the spirit of this invention but without departing from the scope of the appended claim.

What we claim and desire to secure by Letters Patent is:

A device for recovering buried pipe, comprising, a tubular sleeve member adapted to encircle a pipe and to be slidable longitudinally over said pipe, said sleeve member having a sharpened leading edge, a single flat, rigid blade member centered above said sleeve member and extending upwardly therefrom to above the surface of the ground overlying said pipe, said blade member having its leading edge sharpened and hardened to resist abrasion, a pivotal connection between the lower end of said blade member and said sleeve member, said connection consisting of a pair of spaced parallel plate members arranged on opposite sides of said blade member and rigidly connected to said sleeve member and a pivot pin extending transversely through said plate members and said blade member, the leading edges of said parallel plate members lying in a plane extending at approximately a right angle to the longitudinal axis of said sleeve member whereby earth is deflected substantially laterally by said plate members and said blade member, and means for connecting a pulling force to the upper end of said blade member.

BEN D. MARKS.
OREL ELTON DILLON.


## REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 1,808,974 | Wilkens | June 9, 1931 |
| 2,129,453 | Van Sickle | Sept. 6, 1938 |
| 2,386,615 | Knapp | Oct. 9, 1945 |
| 2,396,849 | Herbert | Mar. 19, 1946 |