F. G. HAYES.

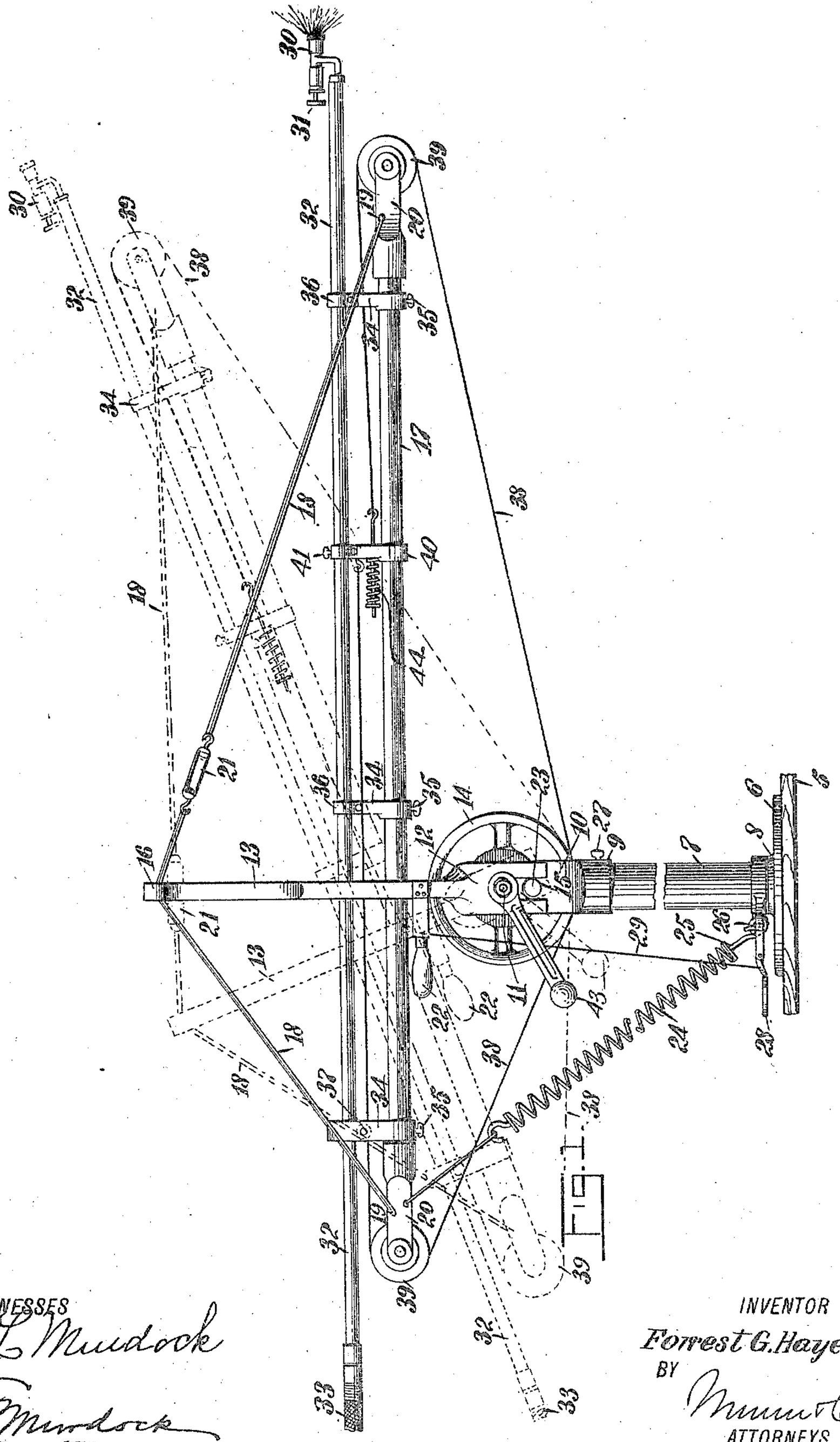
TREE SPRAYER.

APPLICATION FILED AUG. 3, 1909.

950,916.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 1.



WITNESSES

H. L. Murdock

E. F. Murdock

INVENTOR

Forrest G. Hayes

BY

Munn & Co

ATTORNEYS

F. G. HAYES.

TREE SPRAYER.

APPLICATION FILED AUG. 3, 1909.

950,916.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 2.

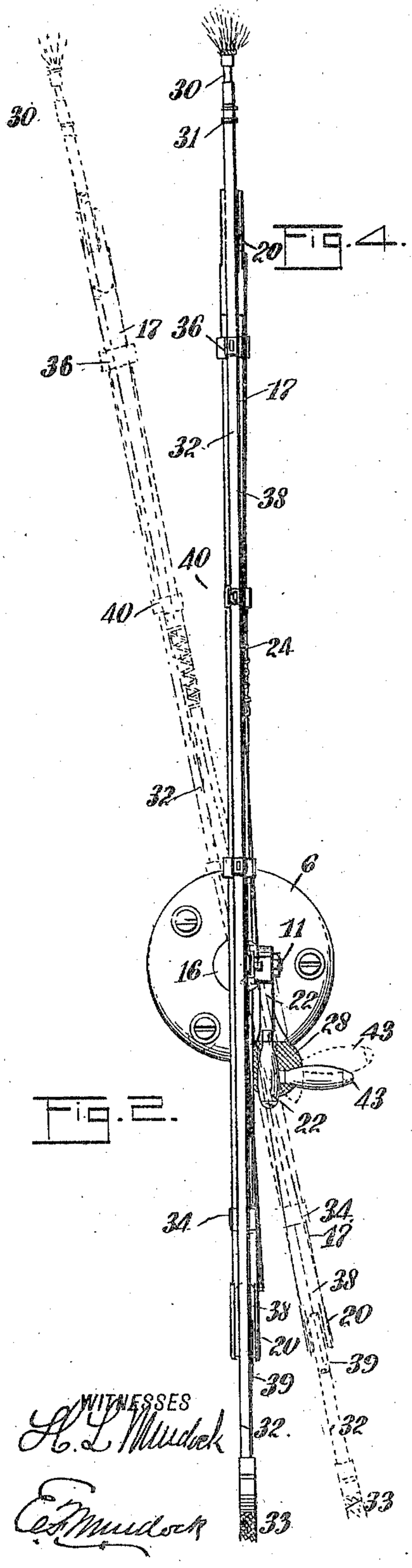


Fig. 2.

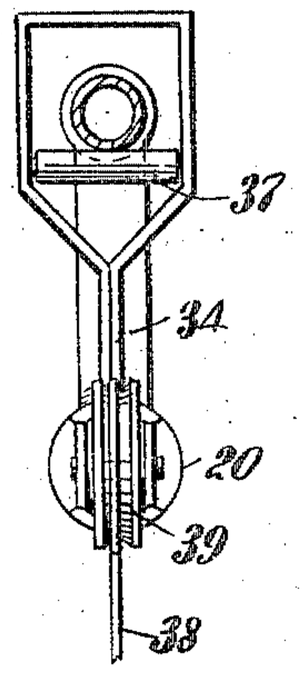


Fig. 4.

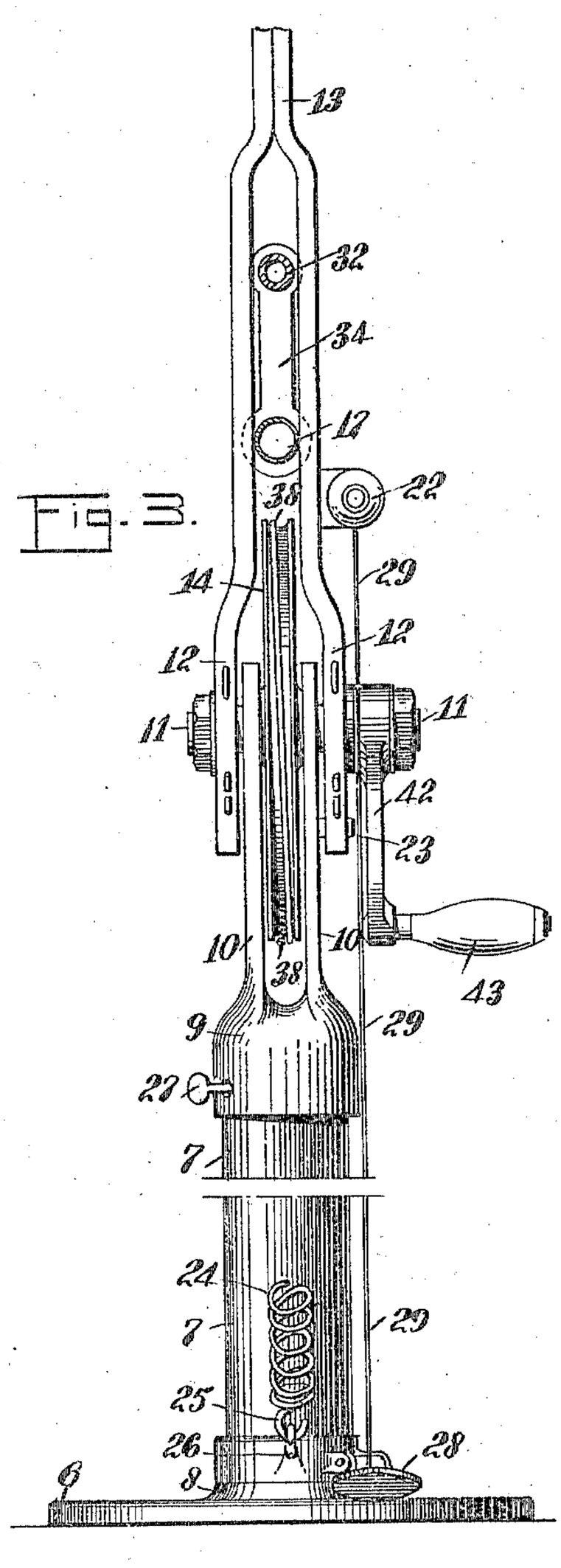


Fig. 3.

WITNESSES

H. L. Murdock

E. L. Murdock

INVENTOR

Forrest G. Hayes

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

FORREST G. HAYES, OF SHARON, PENNSYLVANIA.

TREE-SPRAYER.

950,916. Specification of Letters Patent. Patented Mar. 1, 1910.

Application filed August 3, 1909. Serial No. 510,964.

To all whom it may concern:

Be it known that I, FORREST G. HAYES, a citizen of the United States, and a resident of Sharon, in the county of Mercer and State of Pennsylvania, have invented a new and Improved Tree-Sprayer, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide an apparatus of the character described which is light and adapted to be operated from a position much lower than the usual spraying towers; to provide an apparatus for directing the fluid being sprayed, which may be extended or retracted from the operating station; to provide an apparatus of the character specified, with means for extending and retracting the operating position of the spraying device; and to provide a construction wherein the spraying apparatus may be operated by one person.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a side elevation of the apparatus constructed in conformity with the present invention; Fig. 2 is a plan view of the same; Fig. 3 is a rear end elevation, partly in section, of the apparatus; and Fig. 4 is a detail view in end elevation, partly in section, of the support for the spraying pipe.

The apparatus shown in the drawings is generally mounted upon a wagon, to the floor 5 of which is suitably fastened, by bolts, a wide-spread flange 6. Upwardly extended from the flange 6 is a suitable standard or tube to receive a tube 7, mounted upon a central boss 8 provided on the flange 6. The tube 7 is of any convenient length, upon the upper end of which is mounted a tubular socket 9, from which are extended parallel arms 10, 10. Through the upper ends of the arms 10, 10 is passed a bolt 11, which forms a pivot whereon are mounted the yoke ends 12, 12 of a carrying mast 13 and a pulley 14.

As stated, the mast 13 is pivoted at the lower end by the yoke arms 12, 12. These arms are formed from flattened bars, at the lower end whereof are formed recesses 15, 15, and at the upper end whereof is formed an eye 16. Between the lower section of the mast, and supported thereon, is a boom 17. The boom 17 is fixedly mounted on the said mast where it extends between the members thereof, and is extended to any suitable extent at each side of said mast. It is supported in this extended position by supporting cables, 18, 18, each of which is threaded through a perforation 19, 19 formed in the body of the bearing forks 20, 20 mounted on the ends of the said boom. One or the other of the cables 18, 18 is passed through the eyelet 16 at the top of the mast 13, and both cables are connected through a swivel connection 21, whereby the cables may be tightened to render the boom 17 more rigid in its position.

The boom 17 and mast 13 are rotated on the pivot bolt 11. For this purpose is provided a handle 22 fixedly secured to the mast 13. The mast 13 is held in a vertical position by a pin 23 adapted to extend within the recess 15 and through holes provided in the parallel arms 10. When this pin 23 is in position within the said recess, the mast 13 is held rigid in a position wherein the boom 17 is maintained horizontal. It is in this position that the apparatus is held while being transported to and from the field of operation. When the pin 23 is withdrawn, the boom 17 is balanced by an expansion spring 24, which is connected to the short end of the boom, and by a pivot bolt 25 to an eyelet 26 secured to the tube 7. With the pin 23 withdrawn, the operator, by grasping the handle 22, may throw the boom to any reasonable vertical angle, such as shown in dotted lines in Fig. 1 of the drawings. If the pin 27 is not set to hold the socket 9 from rotating upon the standard 7, the boom 17 may be thrown to any horizontal angle, as illustrated by dotted lines in Fig. 2 of the drawings. In all positions, by means of the spring 24, the boom 17 and devices connected therewith, are balanced. By means of this double adjustment of the boom 17 vertically and horizontally, a spraying attachment secured thereto may be directed in its operation against all desired locations. There is provided on the standard, and suitably mounted thereon, a foot pedal 28, which is secured to the handle 22 by means of a cable or rod 29. This construction is provided as an auxiliary whereby the tilting of the boom and apparatus carried thereby may be effected by means of the foot of the operator, thus leaving at liberty one of his hands. This is desirable only where the spraying

apparatus is operated by a hand pump, and where it is desired that the operator directing the spraying apparatus shall operate the said boom.

The spraying apparatus comprises a suitable nozzle 30, having a regulating pin 31. The nozzle 30 is suitably mounted upon the end of a small pipe 32, which is suitably coupled at the end opposite that bearing the sprayer, to a fluid supply pipe 33. The pipe 32 is slidably mounted in brackets 34, 34, which are fixedly mounted upon the boom 17 being adjustably secured thereto by wing bolts 35, 35, or any suitable form of set screws. The brackets 34, 34 stand vertical so that their heads 36, 36 come directly above and in line with the mast 13. When the pipe 32 is mounted within the brackets 34, 34, the pipe may be moved back and forth therein. To carry the added weight of the supply pipe 33 the rear-most bracket 34 is provided with an enlarged head and bearing roller 37, upon which the pipe 32 rests and is supported. The pipe 32 is advanced and retracted within the brackets 34, 34 by means of a continuous cable 38. The cable 38 is completely wound at least once upon the pulley 14, and is extended from the said pulley 14 around the idler pulleys 39, 39 mounted in the forks 20, 20, both of which are fixedly mounted upon the ends of the boom 17. The ends of the cable 38 are secured to a bracket 40. The bracket 40 is similar to the brackets 34, 34, except that it is secured fixedly to the pipe 32 and is mounted slidably on the boom 17. The fastening for the bracket 40 upon the pipe 32 is adjustable in character, the said bracket being secured to the pipe by a wing bolt or set screw 41. The pulley 14 is fixedly attached to the bolt 11, as is also the crank 42, which is provided with a handle 43. It is by the handle 43 that the pulley 14 is revolved, and by winding the cable 38 thereon in one direction or the other the pipe 32 is extended beyond the forward end of the boom or retracted thereon. A spring 44 is suitably mounted upon a bolt, at the one end of which is secured the cable 38. The cable 38 is arranged to this end to exert a compression upon the said spring, or to receive the expansion thereof to maintain the said cable taut. It will be noticed that the pipe 32 may be of any convenient length, and it may be adjusted to any suitable initial extension of the spray carrying end.

With an apparatus thus described the operation is as follows: The pipe 32 is suitably connected with the spray pipe 33. The pipe 33 is generally connected to a source of supply wherein the liquid is maintained under constant pressure. It will be noticed that this apparatus is designed more particularly for the spraying of liquids used for the destruction of vermin or other life injurious to trees and plants. It may, however, be used for spraying whitewash for the purpose of covering wood structures. The supply pipe having been thus connected, and the pin 23 having been withdrawn from its engagement, the operator grasps the handle 22 and elevates and directs the spray toward the object against which it is sought to throw the liquid. The fluid supply is then turned on. If the spraying device 30 is too far removed from the object, or it be desired that the flow be more concentrated upon the object, the operator turns the pulley 14 to wind the cable 38 in such manner as to project the pipe 32 beyond the end of the boom 17. In this movement of the pipe 32, the said pipe slides in the brackets 34, 34 and is guided on the boom 17 and held from lateral movement thereon by the bracket 40, to which the cable 38 is attached. The extended movement of the pipe 32 is limited only by the placement of the forward bracket 34. By placing the brackets 34, 34 at longer distance apart the extension of the pipe 32 may be materially augmented. By means of the handle 43 the direction of the operation of the sprayer and the pipe 32 to which it is attached may be varied to suit any and all conditions of operation. With such an apparatus it will be observed that it is possible to extend the sprayer into the uppermost branches of fruit trees of the usual height, or to project the sprayer within the foliage, and in juxtaposition to the heavy branches or tree trunks, and to withdraw the same horizontally from the foliage without breaking or otherwise marring the same. When the apparatus is mounted upon a wagon after the spraying operation has ceased, the boom is brought to a horizontal position and the pin 23 is set in the perforation in the arm 10 there provided. The pipe 32 is then retracted to its balanced position, as shown in Fig. 1 of the drawings, and the boom 17 is drawn to a position parallel with the length of the wagon, and the pin 27 pressed in the perforation provided for it in the tube 7.

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

1. A tree sprayer, comprising a standard adapted to be pivotally mounted upon the body of a vehicle, a boom extended both sides of said standard and pivotally secured thereto to move in both horizontal and vertical directions, a delivery pipe slidably mounted on said boom and provided at one end with a spraying device and adapted to be secured to the supply pipe at the opposite end, and means for sliding the said pipe to advance the spraying device beyond the end of said boom.

2. A tree sprayer, comprising a standard adapted to be pivotally mounted upon the

body of a vehicle, a boom extended at each side thereof to operate in vertical and horizontal planes, a delivery pipe slidably mounted upon said boom provided with a spraying device at one end and adapted to be connected to the supply pipe at the other end, a cable connected to said delivery pipe to move the same in opposite directions, guide pulleys mounted at the opposite end of said boom to guide said cable, and a winding pulley adapted to move said cable in opposite directions.

3. A tree sprayer, comprising a standard adapted to be pivotally mounted upon the body of a vehicle, a boom extended at each side of the said standard and pivotally connected therewith to move in horizontal and vertical planes, a delivery pipe slidably mounted upon said boom provided at one end with a spraying device and connected with a supply pipe at the other end, a shifting mechanism for said delivery pipe embodying a winding drum, a cable attached to said delivery pipe to move the same in opposite directions, pulleys pivotally mounted on the end of said boom, and means for balancing the said boom and members connected therewith.

4. A tree sprayer, comprising a standard adapted to be pivotally mounted upon the body of a vehicle, a mast pivotally mounted on said standard adapted to move in a vertical plane, means for locking the said mast in a vertical position, a boom extended from said mast, a supporting member connecting the top of said mast to the end of said boom, a back stay member for holding said mast against the pull of the boom, a delivery pipe slidably mounted on said boom having a spraying device at one end thereof and adapted to be connected to the supply pipe at the opposite end, and means for moving the said delivery pipe in its operation on said boom.

5. A tree sprayer, comprising a standard adapted to be pivotally mounted upon the body of a vehicle, a mast pivotally mounted to operate in a vertical plane upon the said standard, a boom extended horizontally from said mast, a supporting member extended through the top of said mast to the outer end of said boom, staying devices for reinforcing the said mast against the pull of said boom, a delivery pipe slidably mounted on said boom, provided with a spraying device at the outer end thereof and adapted to be connected to a supply pipe at the inner end thereof, means for adjusting said delivery pipe upon said boom, and foot-operated means for changing the vertical angle of the said mast and the boom connected therewith.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FORREST G. HAYES.

Witnesses:
ELMA A. TANNER,
C. C. BRIGGS, Jr.