W. LANG.

TUBING SPEAR.

APPLICATION FILED JAN. 19, 1910.

985,263. Patented Feb. 28, 1911.

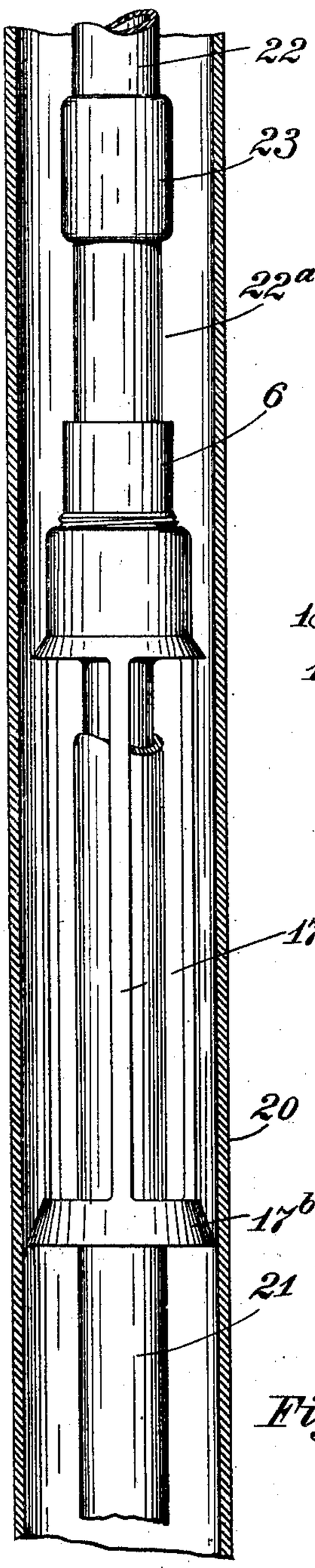

Fig. 1.

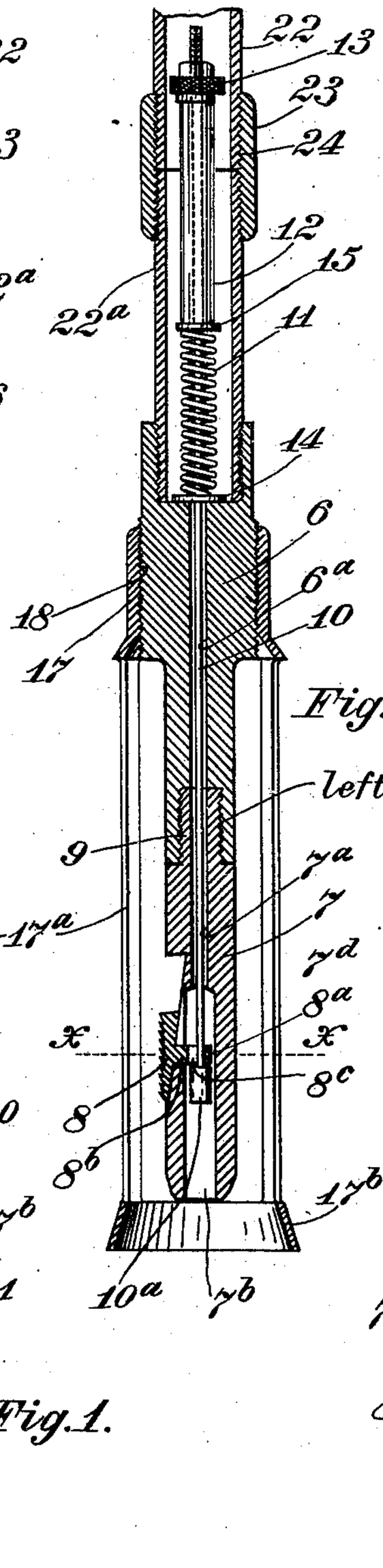

Fig. 2.

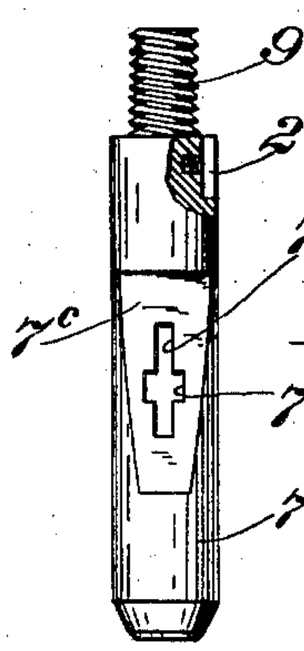

Fig. 3.

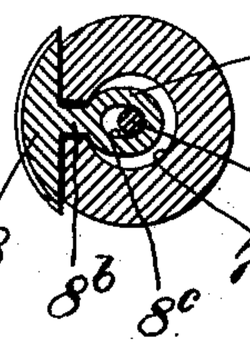

Fig. 4.

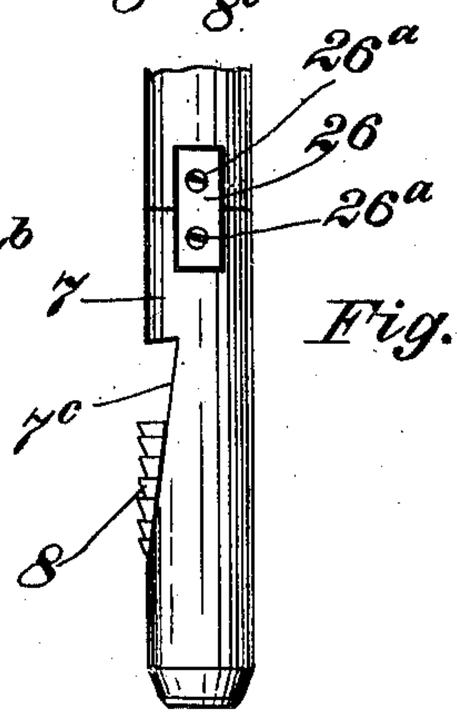

Fig. 5.

Witnesses
Benj. Finckel
Mayne Foard

Inventor
William Lang
by Finckel & Finckel
his Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM LANG, OF GERMAN TOWNSHIP, ALLEN COUNTY, OHIO.

TUBING-SPEAR.

985,263. Specification of Letters Patent. **Patented Feb. 28, 1911.**

Application filed January 19, 1910. Serial No. 538,917.

To all whom it may concern:

Be it known that I, WILLIAM LANG, a citizen of the United States, residing in German township, in the county of Allen and State of Ohio, have invented a certain new and useful Improvement in Tubing-Spears, of which the following is a specification.

This device is designed for use in recovering tubing from exhausted wells.

The object of the invention is more especially to provide means whereby the spear can be released from its hold on the pipe in the event it is found that the tube or pipe cannot be drawn.

A second object is to provide means whereby a similar device can be used to recover a spear that has become lost or separated from the tubing to which it is attached.

The invention is embodied in the particular instance of it herein shown and described and then pointed out in the claims.

In the accompanying drawing—Figure 1 is an elevation of the device showing the position of parts when the spear is engaged with a tube, the outer tubing or casing being shown in section. Fig. 2 is a central vertical section of the spear. Fig. 3 is a detail view in elevation of the stock or member that contains the holding jaw. Fig. 4 is a horizontal section on the line x—x Fig. 2 the scale being enlarged. Fig. 5 is a detail view in side elevation showing the device for locking the stock to the spear body.

In the views 6 designates the body of the device which is perforated axially as indicated at 6^a.

7 designates the stock that carries the holding jaw or gripper. This stock 7 which is tapered at its lower end has an axial perforation 7^a of enlarged diameter to form a socket at its lower end as seen at 7^b. The stock is connected with the body by a left hand thread at 9 and the axial perforations of the stock and body aline with each other. One side of the stock 7 is cut out and formed with a surface that is inclined upwardly and inwardly toward the axis of the stock as seen at 7^c and through this surface into the socket 7^b is made a longitudinal slot 7^d that is enlarged about midway its length laterally at both sides as seen at 7^e.

8 designates the gripping jaw which is best made of tempered steel, and which has a shank with a lug 8^a having a neck 8^b that just fits the slot 7^d so as to be guided thereby. The lug 8^a is of larger width than the slot proper 7^d hence the lateral enlargement of the slot at 7^e to permit the insertion of the lug into the socket 7^b. The lug is made with an elongated hole or slot 8^c so that it can oscillate on a rod passed through the slot when the relative positions of the two are changed.

10 designates a rod having at its lower end a knob 10^a of larger diameter than the slot 8^c and this rod is passed up through said slot and the axial perforations of the stock and body with the knob 10^a below the lug which at proper times can support the gripper. The extreme upper end of the rod 10 is threaded and on the rod is a coil spring 11 and above the latter a tube 12, and there is a nut 13 above the tube on the threaded end of the rod.

14 is a washer resting on the body to form a seat for the lower end of the spring and a washer 15 is provided to form a seat for the spring at the end of the tube. These parts are of such size or are so adjusted that when the stock is turned up fully against the body at the left hand thread 9 the gripper shall rest at or near the lower end of the slot 7^d and its toothed surface will project beyond the plane of the side of stock and therefore grip or bite into the inner side of a pipe whose diameter is less than the combined diameters of the stock and gripper when the latter is in the lower end of the slot 7^d, and so that when the length of the body and stock are increased by turning the body on the stock (when fixed) to the left the knob 10^a will draw the gripper up the incline 7^c and reduce the combined diameter of the gripper and stock so as to be equal to or less than the diameter of the tube engaged or so that the gripper shall be released and permit the stock to be withdrawn from the tube. The serrations of the gripper point upward and because the gripper is free to move upward on the rod it is easy to insert the stock into a tube but in the position of the parts shown in Fig. 2, after the stock is inserted, the gripper takes hold of the tube when lifted upward. Gravity causes the gripper to lag behind when the stock is thus drawn upward hence the stock and gripper become pinched in holding position and permit a pull on the tube.

In deep well drilling the hole is first made large for some hundreds of feet. In this large hole a "casing" is inserted. Beyond

the first large hole the hole is continued of smaller diameter and a second tube shown at 20 is inserted and after this a third tube shown at 21 is inserted. The third tube carries up the product, if the hole does not turn out to be a "dry" one. It is the third or last tube that is usually intended to be recovered. This third pipe is of smaller diameter than the second one and there is space between it and the next tube. To guide the spear into the tube to be drawn a petticoat or bell-shaped device having a shank 17 that threads at 18 onto the body of the spear and a barred frame 17ª terminating in a flaring ring 17ᵇ at its lower end is provided. The petticoat is made of such length that its lower end lies below the point of the stock, and the lower ring is made of a diameter to fit within the second tube (20) referred to. The petticoat is thus a centering device adapted to direct and guide the spear into the tubing to be recovered from the well. The spear thus constructed is attached at its body by right hand threads at 24 to the necessary length of pipe or manipulating member to reach from the surface of the ground to the tubing to be recovered said pipe being made up of sections 22, 22ª, connected by unions like that shown at 23 with right-hand threads. It will thus be observed that when it is impracticable to pull a tube the right hand threads of the manipulating pipe 22, 22ª, permit a tort of the latter to elevate the body of the spear from the stock at the threads 9, and thus withdraw and release the gripper. In this operation care should be taken that the parts are so adjusted that the stock shall not be detached from the body on unscrewing the latter it sufficing to move them asunder sufficiently to cause the body to rise to a point where the combined diameter of the gripper and the stock are made less than that of the tube engaged as before pointed out.

Occasionally in the attempt to pull a tube the manipulating pipe 22, 22ª, becomes ruptured especially at the connection of the sections. In this event it is desirable to recover the lost spear. This can usually be accomplished by inserting in the upper end of the lost portion of the pipe 22, 22ª another spear having the stock locked to the body, as by a steel key 26 set in a suitable socket as at 27 in each of the two parts and held by set screws 26ª as shown in Fig. 5. With this new spear inserted and wedged in the pipe 22, 22ª, the body of the lost spear can be rotated and its gripping jaw released after which it is an easy matter to draw out both spears and the fragment of manipulating pipe attached. In the ordinary use of the device the steel locking key is, of course, omitted and is only to be added in the special exigency described.

What I claim is:

1. In combination with the body portion, a stock having a threaded connection with said body portion, a gripping jaw sliding in said stock, a rod 10 extending through the body portion and into the stock and having means at its lower end to engage the said jaw, said rod being threaded at its upper end and provided with an adjustable nut, a tube 12 on said rod below said nut and a spring 11 on said body portion below said tube and supported on said body portion, whereby when said body portion and stock are conjointly elongated said rod acts on said jaw with an increasing but yielding strain, substantially as described.

2. In a tubing spear, the combination with the body portion, a stock having a threaded connection with said body portion, a gripping jaw sliding in said stock, and yieldingly supported means in the body portion extending into the stock and provided with means adapted to engage but be normally disengaged from the jaw, said means adapted to engage the jaw and act on the same with a yielding strain when the combined length of the body portion and stock is increased by turning the body portion on the stock, substantially as described.

WILLIAM LANG.

Witnesses:
T. R. HAMILTON,
J. H. HAMILTON.