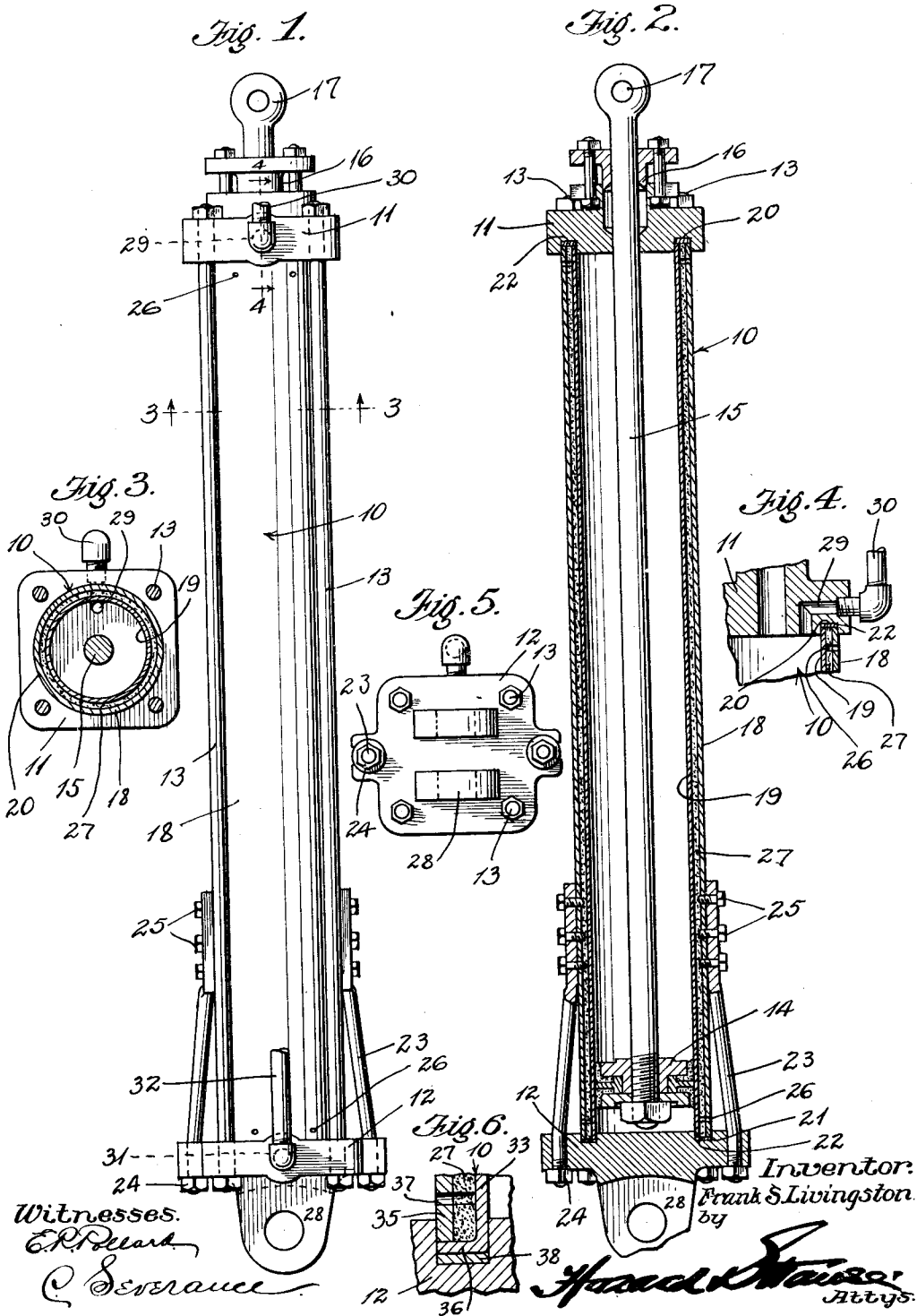


F. S. LIVINGSTON.
HYDRAULIC JACK.
APPLICATION FILED MAR. 11, 1912.

Patented Jan. 21, 1913.

1,051,339.



UNITED STATES PATENT OFFICE.

FRANK S. LIVINGSTON, OF LOS ANGELES, CALIFORNIA.

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Specification of Letters Patent.

Patented Jan. 21, 1913.

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To all whom it may concern:

Be it known that I, FRANK S. LIVINGSTON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Hydraulic Jacks, of which the following is a specification.

This invention relates to improvements in hydraulic jacks and particularly such as are especially adapted for use in connection with water well apparatus.

It is an object of the invention to provide a jack such as is suitable for the sinking of well casings and like purposes which can be made of lighter material than has been heretofore necessary for such purposes and yet a jack be formed which is fully as strong if not stronger than those heretofore used.

It is also an object of the invention to provide a jack with a plurality of cylindrical walls having a space between them and a suitable filling placed therein whereby a light and strong cylinder casing is formed.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of a jack constructed in accordance with this invention. Fig. 2 is a longitudinal vertical sectional view through said jack, the piston rod therein being shown in elevation. Fig. 3 is a transverse sectional view taken upon the line 3—3 of Fig. 1. Fig. 4 is a detail fragmentary sectional view taken upon the line 4—4 of Fig. 1. Fig. 5 is a bottom plan view of the lower plate of the jack. Fig. 6 is an enlarged fragmentary sectional view through the lower edge of the cylinder wall where it seats in the head of the jack.

The details and features of the invention will now be more particularly described, reference being had to the said drawing in which—

10 indicates the barrel of jack, 11 the upper head thereof and 12 the lower head. The said heads are drawn toward each other and tightly held upon the ends of the barrel 10 by means of rods 13, which extend from one to the other and pass through apertures therein, securing nuts being applied to their outer ends.

The jack forming the subject matter of the present invention is especially adapted for use in connection with water well apparatus and in using the same with such mechanism, two more of the said jacks are usu-

ally planted in the ground each side of the well, the lower heads 12 being connected with suitable anchoring means which is embedded in the ground below them, whereby the jacks cannot be pulled from position. The jacks are provided with pistons 14 moving in the cylinders and having piston rods 15, which extend outwardly through the upper head 11 and through a suitable packing gland 16 mounted thereon. The outer ends of said pistons are usually provided with eyes 17 by which they may be connected with links that are capable of being attached to a cross head, for forcing the well casing into the ground.

The pistons are raised usually by hydraulic power and a new section of a well casing put in position and pressure is then applied to the upper sides of the pistons for forcing them downwardly and driving the well casing deeper into the ground. Heretofore it has been necessary to employ a heavy casting for the barrels of such jacks and bore the same, leaving heavy thick walls in order to be sure of obtaining the required strength. Such jacks are very difficult to put in place or move. In the present instance the barrel of the jacks is formed in an entirely different way. In forming said barrel, a steel tube is employed as 18 within which is arranged a seamless brass tube 19. The tubes are of such a size that a space is left between them, which is filled with any suitable filling means, as for instance liquid sulfur to make it possible to run the same into the said space between the tubes. The sulfur is allowed to set in such a manner as to completely fill the space between the tubes so as to brace one tube against the other. The filling material may be of other substance in lieu of the sulfur; thus the filling may be made of any cementitious material flowed into the space and allowed to set, or any other desired substance may be used which will pack and properly fill the space between the tubes. The ends of the barrels thus formed are fitted into annular grooves 20 and 21 formed in the heads 11 and 12 of the jack.

A packing strip 22 of any suitable material as for instance soft lead or other substance is placed in the bottom of the grooves 20 and 21 to thoroughly pack the joint made between the parts and to prevent leakage at such points. The outer tube 18 is also pref-

erably connected with the lower head 12, by means of bolts 23, which pass through apertures in the head at their lower ends, being drawn up and secured therein by means of
 5 nuts 24, while their upper ends are secured to the said tube by means of screws 25 passed through the parts as clearly shown in Fig. 2. In this manner the lower head is prevented from being pulled from the lower end of
 10 the barrel, when the upper head is being taken from the jack to repack the piston.

In the event of the joint between the ends of the barrel 10 and the heads 11 and 12 being not made absolutely tight and a slight
 15 leakage occurring under the hydraulic pressure applied within the said barrel, apertures 26 are made in the outer tube 18 and the filling packing material 27 between the tubes. Any slight leakage will thus be permitted to escape without tending to bulge
 20 or spread the tubes. Pressure working its way between the tubes would of course tend to force the inner tube inwardly since the brass tube is not possessed of great strength. The lower head 12 is provided with depending
 25 lugs 28 by which the said head can be secured to the anchoring means by which it is fastened in the ground. The upper head is provided with an inlet passage 29 entering from the side thereof and arranged to
 30 discharge within the barrel as clearly shown in Fig. 4. A supply pipe 30 is connected with said passage 29 for introducing the hydraulic pressure. The lower head 12 is
 35 also formed with a like passage indicated in dotted lines at 31 and a pipe 32 is connected therewith. The said pipes 30 and 32 extend upwardly to the surface of the ground when the jacks are buried and are connected with
 40 any suitable source of hydraulic pressure, whereby the water will flow into and out of the barrel at either end desired. While the jacks are more generally employed for forcing casings into the ground, they are some-
 45 times operated in the opposite directions for lifting tools or implements within the well as for instance when it is necessary to operate a knife or cutter in the well, for perforating the side walls at any desired point.

As shown in Fig. 6 the inner tube 33 may be spun or otherwise shaped outwardly at its edges, so as to lap over the filling between the tubes and the edges of the outer tube 35, such end flange being indicated at 36. In
 50 this manner any slight leakage at the heads of the barrel will not generally enter the

space between the tubes. However, if such an occurrence should transpire the vent or escape passage 37 will prevent the bulging of the walls as heretofore described. A
 60 packing 38 is also used in the grooves, which receives the end of the barrel.

The piston 14 may be made of any ordinary construction and it is sometimes necessary to remove the same to replace its pack-
 65 ing, in which event the upper head 11 can be readily removed by taking off the nuts from the rods 13. This can be done without taking the jacks from the ground, when they are buried. The jacks formed as above de-
 70 scribed are usually so light that they can be readily handled by a couple of men. Jacks as heretofore constructed have always been so heavy as to require the employment of a
 75 suitable lifting tackle in moving them from place to place.

The filling of sulfur or a cementitious material permits of a slight yielding of the inner wall against the outer wall and the inner wall being of softer material than the outer
 80 wall will conform perfectly to the filling even though there be a slight shrinkage in the same.

What I claim is:

1. A jack, comprising a double walled
 85 barrel having a filling material interposed between the walls, the end edges of the inner wall being turned outwardly so as to lap upon the end edges of the outer wall and the filling between, heads adapted to be
 90 clamped upon the ends of said barrel, packing means interposed between the ends of the barrel and the said heads, the said heads being provided with passages entering the edges thereof and opening into the ends of
 95 the barrel, and pipes for directing hydraulic pressure through said passages.

2. A hydraulic jack having outer and inner walls formed of tubing, a filling of cementitious material placed between the said
 100 walls, heads clamped upon the ends of said barrel, the outer tube and the filling being perforated near the ends thereof for permitting of the escape of any leakage entering between the walls.

In witness that I claim the foregoing I have hereunto subscribed my name this 1st day of March, 1912.

FRANK S. LIVINGSTON.

Witnesses:

EDMUND A. STRAUSE,
 E. STADLMAN.