March 11, 1930. P. H. MACK 1,749,827

LETTING-IN TOOL

Filed Aug. 1, 1923

Fig. 1.

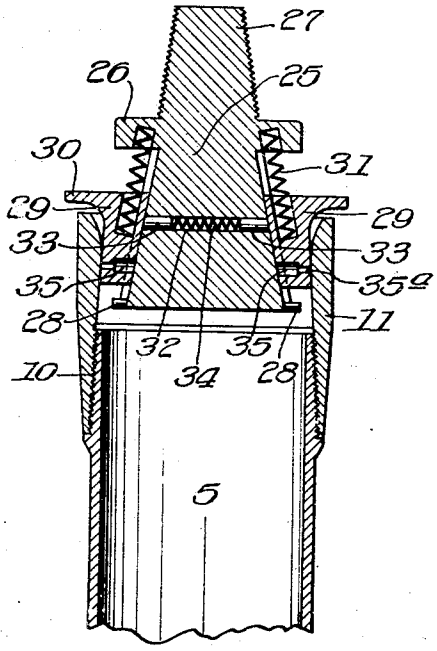


Fig. 2.

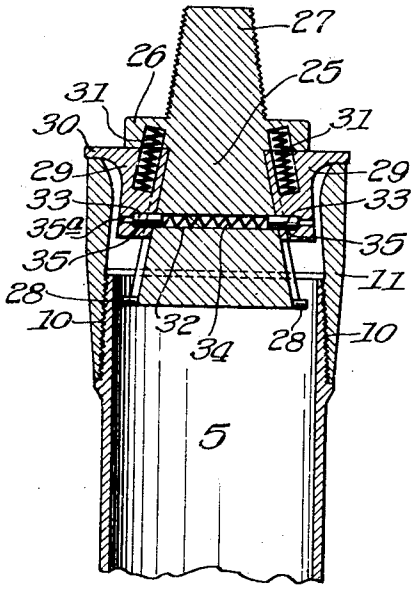
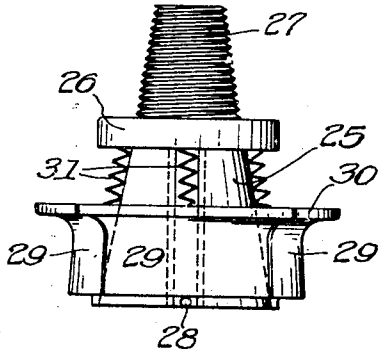


Fig. 3.



INVENTOR

P. H. Mack

by W. G. Woolcock

Attorney.

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UNITED STATES PATENT OFFICE

PATRICK H. MACK, OF BRADFORD, PENNSYLVANIA, ASSIGNOR TO OIL WELL SUPPLY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

LETTING-IN TOOL

Application filed August 1, 1923. Serial No. 655,017.

This invention is for a letting-in tool designed for lowering devices into earth borings or drilled well holes, for example liners. In the following specification I have shown and described my invention in connection with positioning a liner in a well, but other devices may be positioned by the use of my letting-in tool.

In the drilling of oil and gas wells, it is sometimes desirable, in order to save pipe, to put a liner in the well which may extend from a point near the bottom of the hole to a point intermediate the bottom of the hole and the end of the larger casing, or up to the end of the larger casing.

It has heretofore been the practice to lower the liner by means of a string of pipe until the top of the liner is at the desired point, whereupon the pipe was unscrewed from the liner, a right and left hand threaded nipple having been used to connect the liner and string of pipe.

The principal objection to this method, however, resides in the necessity for using a string of pipe for lowering the liner.

The prime object of this invention is to provide a new and novel letting-in tool of the character specified having a tapered body, slips on the body for engaging the work, said slips being expanded and contracted by a movement of the body, and means on said body for attachment to a suspending means.

This and other objects and advantages are attained by my invention, which may be readily understood by reference to the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view of the letting-in tool and a portion of a liner, showing the parts in position to be lowered into a well;

Fig. 2 is a similar view, showing the letting-in device in disengaging position.

Fig. 3 is an elevational view of the letting-in tool detached.

In the drawings I have shown one application of my invention, i. e., to the upper end of a liner 5. For this purpose I provide a collar 11 screw-threaded thereon, as at 10, and having its internal opening tapered outwardly toward the bottom.

The letting-in tool includes a body 25 tapered so as to increase in thickness toward its lower end, and having a flange 26 above the tapered part, the body having a threaded extension 27 above the flange, which threaded extension is of the type commonly used on drilling tools, and enables the body to be screwed onto a string of tools. On the lower end of the body are pins 28.

Slidably retained on the tapered surface of a body or mandrel 25 by means of projections entered in dove-tail slots in the mandrel, are a plurality of slips 29 having flanged upper ends 30. Seated in recesses in the flanges 26 and 30 are relatively stiff compression springs 31.

In the mandrel intermediate the ends of the tapered area thereof are radial recesses 32 in which are pins 33 projected outwardly by springs 34 and confined by the inner surfaces of the slips. At the lower ends of the slips are recesses 35 into which the pins may extend when the slips move up to their uppermost limit, which is the position shown in Fig. 2.

In operation, the letting-in tool is adjusted in the upper end of the collar 11, which is attached to the device to be lowered so that the parts are in the position shown in Fig. 1, and the upper end of the member 25 is screwed into a string of cable tools or the like. The slips 29 cooperate with the tapered interior of collar 11, and thus enable the liner support to be suspended from member 25.

The device is then lowered into the well until it has reached the desired depth.

As soon as the device comes to rest, the weight of the string of drilling tools presses down on body 25 of the letting-in tool, forcing it downwardly against the pressure of springs 31. As the body 25 moves down, the slips 29 contract, the flanges 30 on the slips engaging the top of collar 11, to hold the slips against downward movement. When the body 25 has moved the limit with relation to the slips, recesses 35 are moved into registration with locking pins 33, which are then projected into the recesses. Now, as the string is elevated, the letting-in device is free of the collar and may be lifted out of it, the

pins 33 preventing the slips from moving back into engagement with the collar.

The springs 31 are made sufficiently strong to prevent the release of the letting-in device prematurely, as it may happen that, in being lowered, the device will sometimes encounter a temporary obstruction. Openings 35ª allow for the insertion of a pin to release the slips after the letting-in tool is pulled to the top of the well.

Various changes and modifications may be made in the construction of the various parts within the contemplation of my invention and under the scope of the appended claims.

I claim as my invention:

1. A letting-in tool for lowering devices into earth borings comprising a body having an upwardly tapered lower portion, means at the upper end of the body for attachment to a suspending means, slips slidably carried on the tapered lower portion of the body, means normally tending to move the slips into operative positions, said slips being expanded by a downward movement relatively to the body and being contracted by an upward movement relatively to the body, and lateral stop projections on the slips.

2. A letting-in tool for lowering devices into earth borings comprising a body having an upwardly tapered lower portion, means at the upper end of the body for attachment to a suspending means, slips slidably carried on the tapered lower portion of the body means normally tending to move the slips into operative positions, said slips being expanded by a downward movement relatively to the body and being contracted by an upward movement relatively to the body, lateral stop projections on the slips, and automatic cooperating locking means on the tapered portion of the body and slips for holding the slips against sliding movement when the slips are in contracted position.

3. A letting-in tool for lowering devices into earth borings comprising a body having an upwardly tapered lower portion, means at the upper end of the body for attachment to a suspending means, slips slidably carried on the tapered lower portion of the body, said slips being expanded by a downward movement relatively to the body and being contracted by an upward movement relatively to the body, lateral projections on the slips, a flange on the body above the tapered part thereof, and compression springs engaging the slips and engaging the flange for resisting the upward sliding movement of the slips.

4. A letting-in tool for lowering devices into earth borings comprising a body having an upwardly tapered lower portion, means at the upper end of the body for attachment to a suspending means, slips slidably carried on the tapered lower portion of the body, said slips being expanded by a downward movement relatively to the body and being contracted by an upward movement relatively to the body, lateral projections on the slips, and means on the body for yieldably resisting to the body, lateral projections on the slips,

5. A letting-in tool for lowering devices into earth borings comprising a body having an upwardly tapered lower portion, means at the upper end of the body for attachment to a suspending means, slips slidably carried on the tapered lower portion of the body, said slips being expanded by a downward movement relatively to the body and being contracted by an upward movement relatively to the body, lateral projections on the slips, means on the body for yieldably resisting the upward sliding movement of the slips, and yieldable locking pins on the body, said slips having recesses therein into which the pins may project when the slips are moved against the pressure of said yieldable resisting means to their uppermost contracted position.

In testimony whereof I affix my signature.

PATRICK H. MACK.