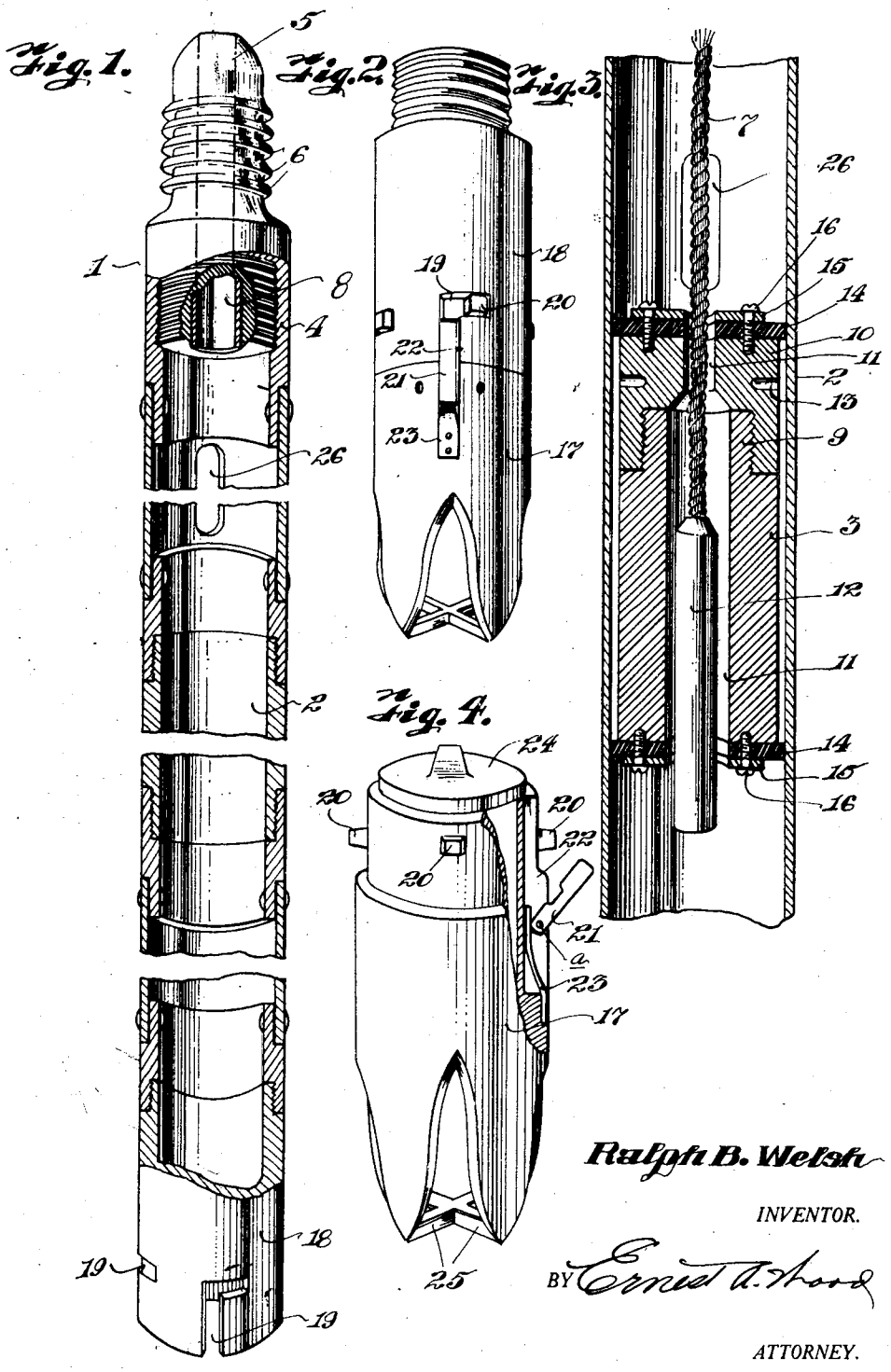
Sept. 25, 1928.

1,685,619

R. B. WELSH

SAND PUMP

Filed April 23, 1927



Ralph B. Welsh

INVENTOR.

BY Ernest A. Hood

ATTORNEY.

Patented Sept. 25, 1928. 1,685,619

UNITED STATES PATENT OFFICE.

RALPH B. WELSH, OF BURKBURNETT, TEXAS.

SAND PUMP.

Application filed April 23, 1927. Serial No. 186,022.

This invention relates to well tools and equipment and it has particular reference to certain improvements in sand pumps, its principal object residing in the provision of an extensible working barrel in which operates the pump piston, and by which, the stroke of the latter may be shortened or lengthened, as the case may be, to adjust its function to suit wells of varying depths and similar purposes.

Another object of the invention resides in a novel hookon joint through which the piston operating cable passes, and is so designed as to render wear on the cable a negligible factor in the operation of the tool, consequently prolonging the usefulness thereof.

The invention likewise includes an improved sand cutting and mixing head designed to meet all the conditions and requirements in bailing wells.

With these foremost objects and advantages in view, the invention has particular reference to its salient features of construction and operation of parts, to which reference will be later made and which are illustrated in the accompanying drawings wherein:

Figure 1 represents an elevational view of a sand pump constructed according to the present invention, shown partly in section, and from which the pump piston has been deleted.

Figure 2 is a side elevational view of the bottom section of the working barrel with mixing head attached.

Figure 3 is a vertical sectional view of a section of the working barrel showing also a sectional view of the pump piston, and

Figure 4 is a detail view of the mixing head showing its valve, and the means for locking the same relative to the working barrel.

Continuing now more in detail with the drawings; 1 denotes a barrel, which, as illustrated in Figure 1, is divided into a number of sections to provide a central chamber 2 in which operates a pump piston 3, illustrated in Figure 3 in cross-section.

Threaded into the upper sections 4 of the barrel is a joint 5, which is reduced as shown, and upon its reduced portion is formed a multiplicity of annular ribs 6. These ribs are for the purpose of simplifying removal of the tool from a well, in case of breakage of the cable 7, by providing a convenient purchase for a fishing tool. It will be noted likewise that the aperture in the joint 5 through which the cable 7 slides is lined at 8 with a material of softer consistency than the joint proper. This feature prevents excessive wear upon the cable 7 during operation.

Referring now to Figure 3, illustrating the piston 3 in operative position in the chamber 2 of the working barrel 1. The piston is composed of a main body portion having an extended threaded portion 9, receiving a head 10. The body of the piston has a central passage 11, occupied by a plunger 12 when the piston is in operation. The passage is reduced at the point where it enters the head 10, to conform with the tapered head of the plunger to provide a seat therefor. The head 10 is further provided with wrench holes 13 for its ready disengagement from the body.

On either end of the piston are applied packing washers 14, overreaching the sides of the piston whereby to conformably engage the walls of the barrel 1 to prevent improper passage of slush. These washers are retained by the plates 15, in turn held by screws 16.

In Figures 2 and 4 is illustrated the preferred form of head 17, receivable in the bottom section 18 of the barrel 1. The conventional L shaped slots 19 are formed in the section 18 to receive lugs 20 on the reduced portion of the head 17, and when so engaged, a locking arrangement to prevent backing off of the head, is provided in the form of a detent 21 pivoted at *a* in the slot 22 formed in the exterior wall of the head 17. This detent is controlled off center by a leaf spring 23 also affixed at one end in the bottom of the slot 22. The detent, when operatively applied enters the continuation of the slot 22 in the section 18, consequently preventing rotation of the head relative to the said section 18. A conventional valve 24 is hinged to the top of the head 17, operated by suction provided by the reciprocation of the piston 3 in the barrel.

In operation, the tool is lowered into the well by the cable 7, whereupon by a jigging motion, together with rotative movement of the tool washer the sand and slush in the bottom of the well are mixed to a semi-liquid consistency, this operation being rendered more efficient by the intercrossing blades 25 formed at the bottom of the mixing head 17.

The piston 3 is drawn upward by the cable

7, causing the valve 24 to open, and the suction created by such upward movement of the piston pulls the slush and sand through the valve 24 into the working barrel. It is understood that the plunger 12 affixed to the end of the cable 7 moves downward at a greater speed than the piston 3, consequently, the liquid caught in the barrel 1 above the trap or valve 24 emerges into the chamber 2 above the piston through passage 11, as the piston slowly moves toward the bottom of the barrel to settle on the plunger 12. Upon upward movement of the plunger and piston, the liquid is expelled through the port 26 in the barrel 1 to be returned into the well, while the slush and sand of heavier consistency is drawn to the ground surface and dispensed with. This operation is carried out as many times as is necessary in cleaning out a well by removing sand and slush to make way for more efficient and profitable pumping.

As stated previously, the stroke length of the piston 3 depends upon the capacity of the barrel 1, and this in turn is altered by the extensible nature thereof.

Manifestly, the construction shown is capable of considerable variation, but such variation as is in keeping with the appended claim is also considered within the spirit of the invention.

What is claimed is:

In a sand pump, a working barrel having an upper end section provided with a corrugated head and central opening to admit a cable, a lower end section arranged for attachment to a sand bottom, a series of intermediate sections so joined together and to said end sections as to permit of incorporation or removal of similar sections to lengthen or shorten said working barrel, and means to permit access to be gained to the interior of said working barrel from the side thereof.

In testimony whereof I affix my signature.

RALPH B. WELSH.