Nov. 7, 1933. F. MILLER 1,934,201

LOAD ASCERTAINING DEVICE

Filed Oct. 20, 1932

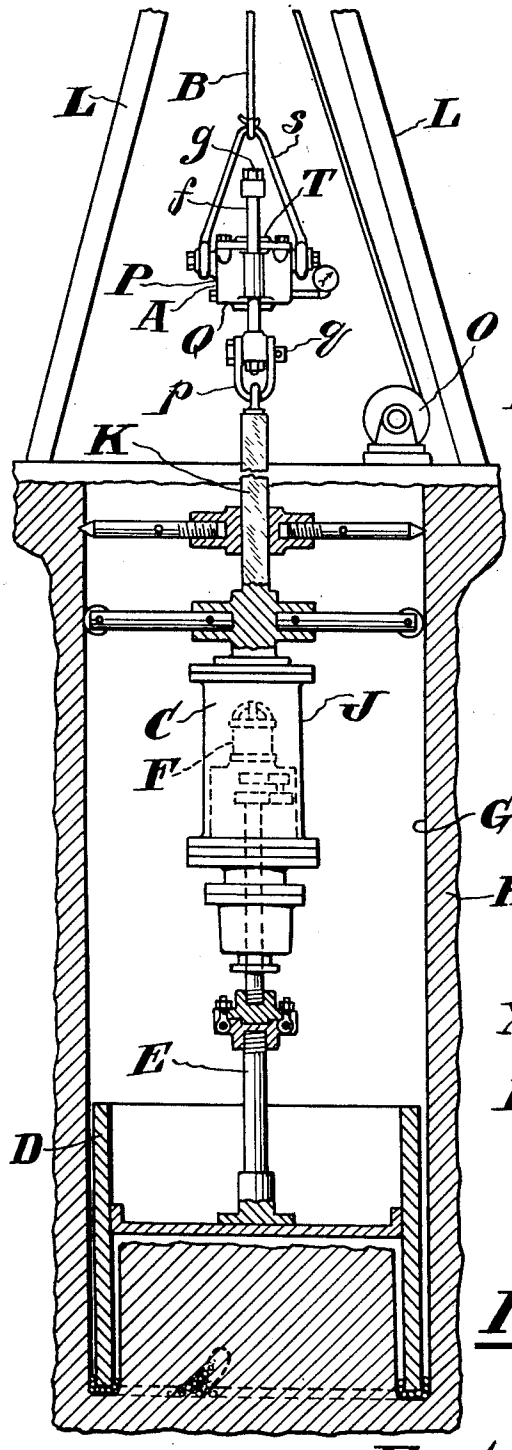

FIG.-1.

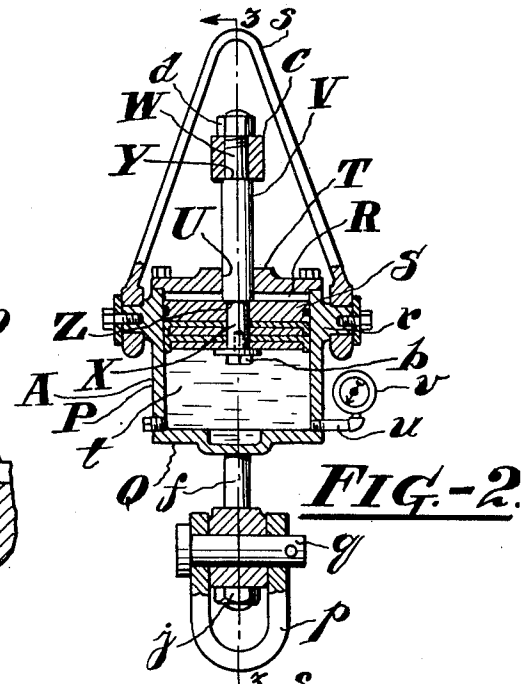

FIG.-2.

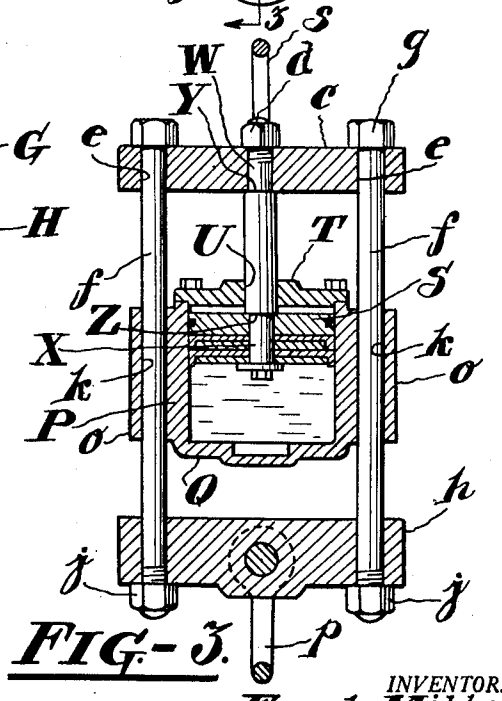

FIG.-3.

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LOAD ASCERTAINING DEVICE

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Application October 20, 1932. Serial No. 638,670

1 Claim. (Cl. 265—47)

This invention relates to load ascertaining devices, and more particularly to a device of that character adapted to be interposed between a supporting and a supported element and serving as a link to connect the two.

One object of the invention is to ascertain the weight of a suspended load through the instrumentality of a fluid column of which the pressure to which it is subjected may be readily indicated.

Another object is to assure against leakage of the fluid from its container.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawing accompanying this specification and in which similar reference characters refer to similar parts,

Figure 1 is a side elevation of a load ascertaining device constructed in accordance with the practice of the invention and showing it applied to a core drilling apparatus, the latter being shown partly in section,

Figure 2 is a sectional elevation of the device, and

Figure 3 is a sectional elevation taken through Figure 2 on the line 3—3.

Referring more particularly to the drawing, the load ascertaining device, designated in its entirety by A, is shown interposed between a supporting cable B and a supported element illustrated, in the present instance, as a core drilling apparatus C.

The apparatus C may include in its organization a core cutting bit D having a shaft E affixed thereto for connecting the cutting bit with the motor F whereby the bit is rotated for cutting a hole G in the rock H. The motor F is arranged in a casing J on the lower end of a stem K the upper end of which stem is affixed to the device A in a manner to be more fully described hereinafter.

The cable B may be secured to the device A in any well known manner and may be trained over a pulley or roller (not shown) but which may be located at the head of a derrick L spanning the hole G. The derrick L may also serve as a mounting for a hoist O whereby the cable is wound and unwound for raising and lowering the drilling apparatus.

Constructed in accordance with the practice of the invention the device A comprises a cylinder P having an integral imperforate lower head Q and an opening R at its upper end for the insertion of a piston S thereinto. A closure is provided for the opening R in the form of a detachable head T having an aperture U to receive slidably a piston rod V.

The upper and lower ends W and X, respectively, of the piston rod are of reduced diameter, and at the junctures of these ends and the main body portion of the piston rod are shoulders Y and Z. The end X extends through the piston S and a screw *b* is threaded thereinto to affix the rod V to the piston S and to maintain the shoulder Z seated firmly against the upper face of the piston S.

Disposed upon the reduced end W of the rod V is a cross-head *c* which seats upon the shoulder Y and is clamped thereto by a nut *d* threaded on the free end of the stem W. In the ends of the cross-head *c* are apertures *e* to accommodate rods *f* which depend from the cross-head *c* and seat with their heads *g* upon the cross-head. The rods *f* lie on diametrically opposite sides of the cylinder P and extend through a cross-head *h* which is arranged beneath the cylinder P. The lower ends of the rods *f* are threaded to accommodate nuts *j* upon which the cross-head *h* may seat.

Preferably the rods *f* are suitably guided by the cylinder P as by extending the rods slidably through apertures *k* in lugs *o* on opposite sides of the cylinder P. A connection is provided between the upper end of the stem K and the cross-head *h* by a clevis *p* which is connected to the stem K and a pin *q* of the clevis is seated in the cross-head *h* midway between the rods *f*.

In order to enable the cylinder P to be conveniently connected to the cable B said cylinder is provided near its top end and on opposite sides thereof with trunnions *r* upon which are mounted the ends of a bail *s* to which the cable B is secured. The bail *s* is of V-shape and of such length that its angular portion overlies the cross-head *c*.

Within the cylinder P is a fluid *t* as for instance oil, and upon which the piston S rests, and at the lower end of the cylinder is a conduit *u* which is connected to a pressure gage *v* to indicate the weight of the load to which the fluid *t* is subjected.

In operation, whenever it is desired to ascertain the load or weight of the apparatus the same may be suspended from the cable and its weight will then be indicated by the gage *v*. In the event that the total weight of the apparatus should be considered excessive, in view of the nature of the rock being drilled, the excess weight of the drilling apparatus may be supported by the hoist O, thus assuring a good drilling action of the cutting bit D.

I claim:

A load ascertaining device forming a link be-

tween a supporting element and a supported element, comprising a cylinder suspended from the supporting element and having an aperture in its upper head, fluid in the cylinder, a piston in the cylinder resting upon the fluid, a piston rod on the piston extending through the aperture, a cross-head on the piston rod, rods connected to the cross-head, means on the cylinder for guiding the rods, a cross-head beneath the cylinder and being arranged on the rods to support the supported element, and means exposed to the pressure of the fluid for indicating the weight of the load.

FRANK MILLER.