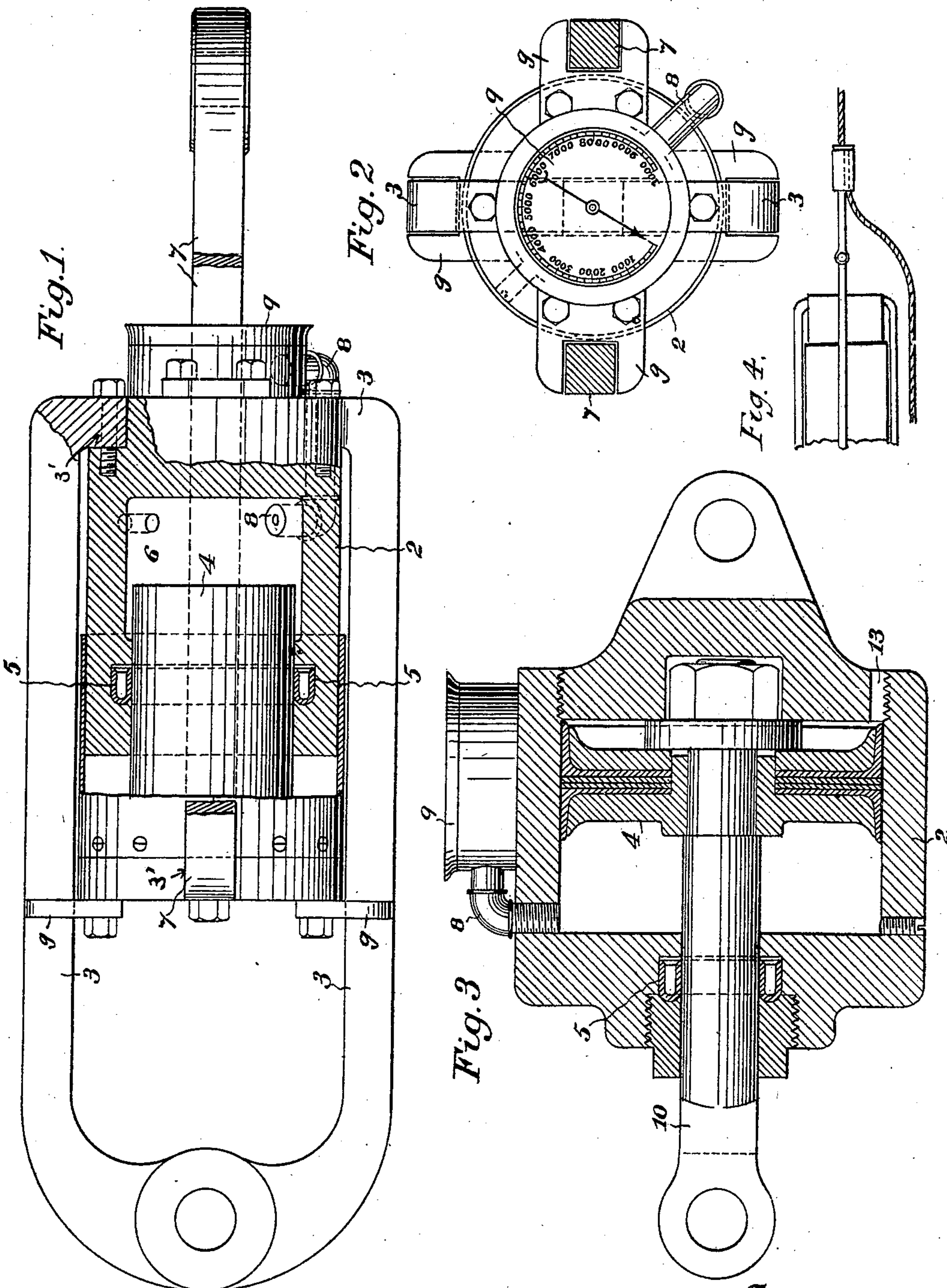


No. 680,371.

Patented Aug. 13, 1901.

H. M. BRITTAN.
STRESS APPARATUS.
(Application filed Nov. 21, 1900.)

(No Model.)



Witnesses,
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UNITED STATES PATENT OFFICE.

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STRESS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 680,371, dated August 13, 1901.

Application filed November 21, 1900. Serial No. 37,213. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. BRITTAN, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Stress Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is particularly designed for testing wire rope, cables, and the like to ascertain the breaking strain.

It consists of the parts and the constructions and combinations of parts hereinafter described and claimed.

Referring to the accompanying drawings, Figure 1 is a part longitudinal section and part elevation of my apparatus. Fig. 2 is an end view of the same. Fig. 3 is a longitudinal section embodying a modification. Fig. 4 is a detail showing a form of clamp and connection and a portion of the loose rope or bight.

Wire ropes, cables, and the like are subjected to great strain. It is desirable to find out what this strain may be in order to supply the proper strength of connection to prevent breakage. This great and varying strain is especially met in lumbering regions, where it is the custom to fix a powerful engine and then to lead wire rope or cable around direction-pulleys to the logs which are to be moved. The rope being fastened to the log, the power is applied until the log moves or the rope breaks. It is desirable to avoid this breaking of the connecting ropes or parts by supplying ropes of sufficient strength, and it is the purpose of this apparatus to test such ropes and ascertain the breaking strain when in actual service. It is manifest that the device may be applied in any other connection where such an apparatus can be used.

As shown in the drawings, 2 is a cylinder provided with means for the attachment of a yoke 3. As herein shown, these means, which may be of a varied character, consist in bending the ends of the yoke inward and securing them in recesses 3' in the cylinder and plunger, respectively. Guides *g* on the cylinder and plunger preserve the position of the yokes.

The device is inserted at any point desired between the parts to be tested. When used with a rope, a sufficient amount of slack is taken in the rope to form a loose portion or bight, which passes around the apparatus. The yoke 3 is connected by suitable means with one portion of the rope, and the other part of the rope is connected by a clamp or shackle or other well-known form of attaching device with the plunger, so that when the strain is brought upon the two parts in opposite directions the plunger will act against the body of liquid contained within the cylinder, and pressure from this liquid is transmitted to operate the indicator, as will be hereinafter described.

If desired, the rope or other part to be tested could be in two separate sections, one end of one connected with the cylinder and the other with the plunger, or one portion of the apparatus could be connected to a fixed resisting support of sufficient strength and the rope to be tested connected with the other portion, the action being essentially the same in either case.

Within the cylinder is a plunger 4, movable through a suitable gland with packing, as at 5, and in the chamber 6 of the cylinder a liquid is contained. A plunger 4 has a yoke 7 connecting with it and extending parallel with and exterior to the cylinder and in opposite directions from the yoke 3. These yokes stand, preferably, at right angles with each other, and one may be slotted where it projects beyond the cylinder, so as to form a guide through which the other is slidable. The yoke 7 is then connected with that part of the rope which extends outward from that end of the apparatus, or it may be connected with any fixed or stationary structure when it is desired to simply test the piece of rope, the object being in any case to provide a resistance to whatever strain may be applied. When power is applied, in whatever manner, the pull upon the yoke 3 acts against the pull upon the yoke 7. One yoke, 3, is pulling upon the cylinder and the other, 7, pulling upon the plunger 4 and acting to force it into the cylinder against the liquid.

8 is a passage leading from the liquid-cham-

ber, and 9 represents a pressure-gage of any description. It may be an indicator which shows at once what pressure has been applied, and if the device is used for testing rope or any other article to find the breaking or other strain upon it the dial or indicator will show how much it is. If it is designed to be used upon ropes, as previously described, the breaking strain of the rope being known, the operator will not apply more strain to the rope than it is capable of bearing.

In Fig. 3 I have shown a modification the operation of which is essentially the same as hereinbefore described. In this case the plunger 4, movable in the cylinder 2, has a plunger-rod 10 extending out through a suitable packing-box in one end of the cylinder, and the rope or other part is connected with an eye or equivalent point of attachment at the end of the plunger-rod, while the other part of the rope is attached to the eye or attachment at the opposite end of the cylinder, or, as before stated, one of these parts may be attached to a fixed support. The pressure of the plunger upon the liquid is transmitted to the gage or indicator 9, as previously described. Any leakage which passes the piston or plunger may be drawn off or allowed to escape through a passage, as 13, connecting with the cylinder upon the opposite side of the plunger from that in which the pressure takes place.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. In a stress apparatus the combination of a cylinder, and a piston, yokes connected with the cylinder and piston and extending in opposite directions said yokes including arms having inturned ends secured respectively to the heads of the cylinder and piston; means carried by the yokes for the attachment of a rope or part to be tested; and means for indicating the tension upon the part to be tested.

2. In a stress apparatus the combination of a cylinder; a piston; radial slotted guides fixed to the head of the piston; a yoke the arms of which extend through said guides and are inturned and attached to the head of the cylinder; a second yoke at right angles to the first-named one and radial slotted guides on the head end of the cylinder through which the arms of the second yoke extend said arms having inturned ends fixed to the head end of the piston; means carried by the yokes for the attachment of the part to be tested; and an indicator and means connecting it with the interior of the cylinder whereby the tension transmitted is shown.

In witness whereof I have hereunto set my hand.

HENRY M. BRITTAN.

Witnesses:

S. H. NOURSE,
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