Dec. 25, 1928. 1,696,889

R. W. SCOTT

ATTACHMENT FOR WIRE ROPE

Original Filed March 9, 1926 2 Sheets-Sheet 1

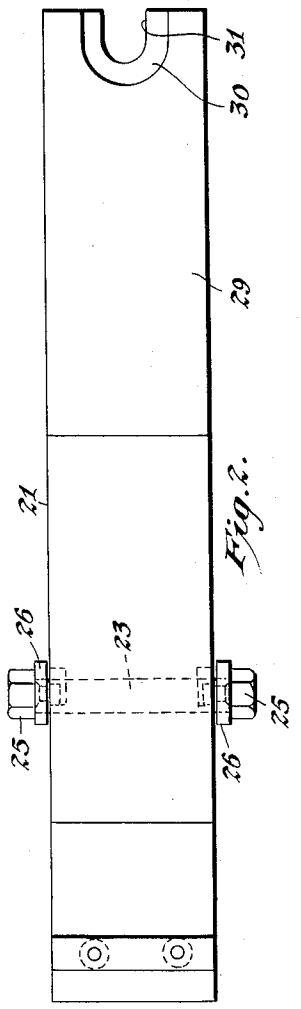


Fig. 2.

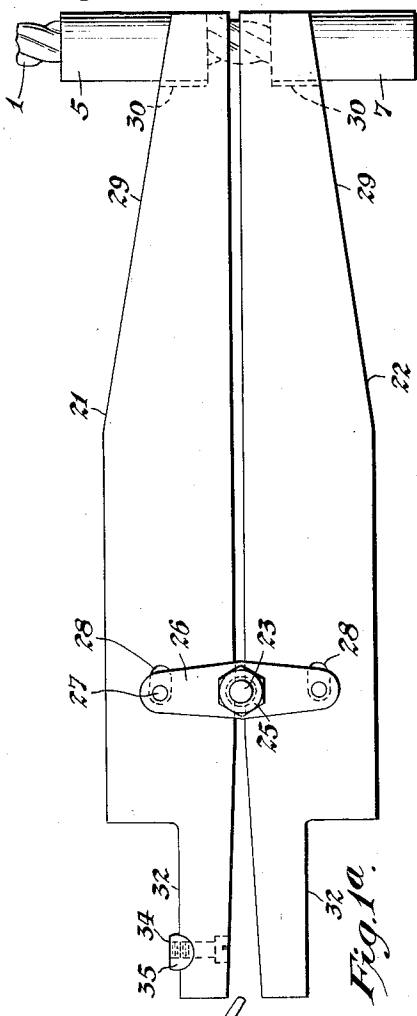


Fig. 1a.

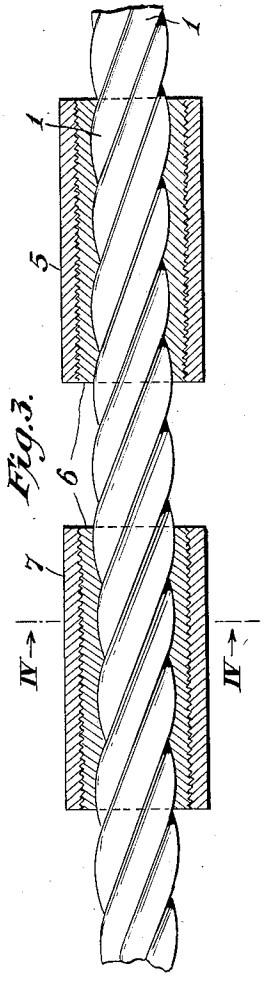


Fig. 3.

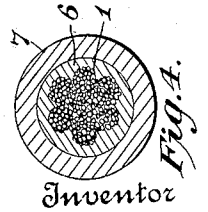


Fig. 4.

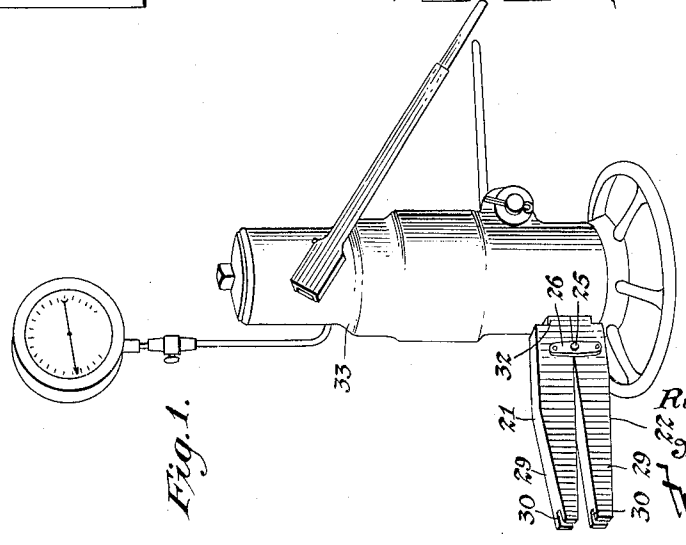


Fig. 1.

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Fig. 6.

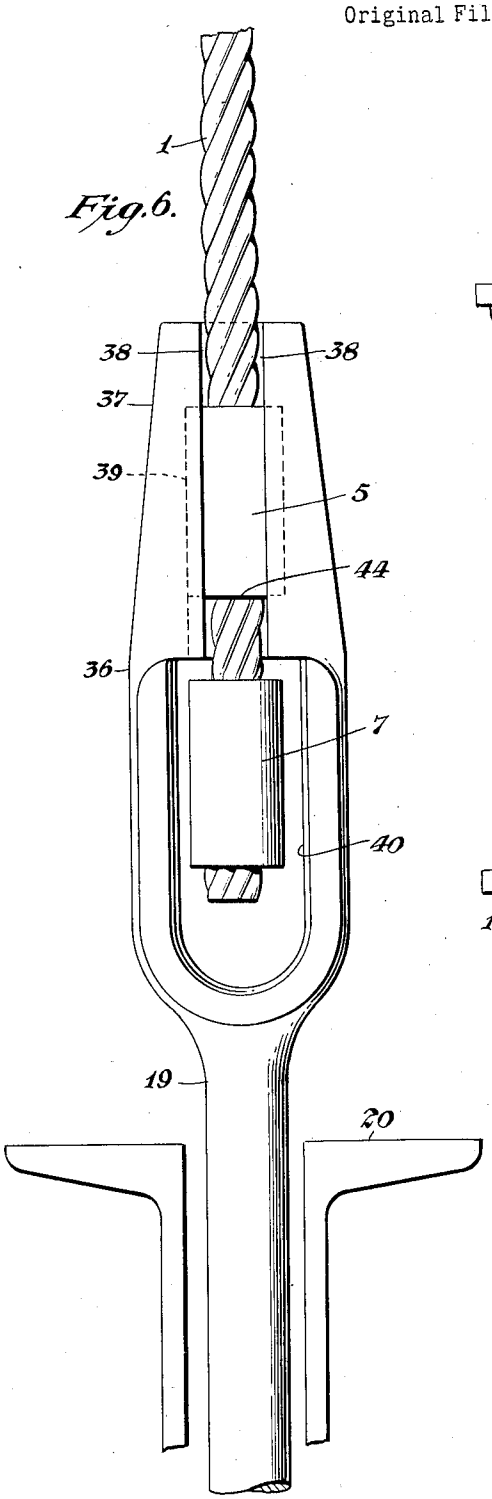
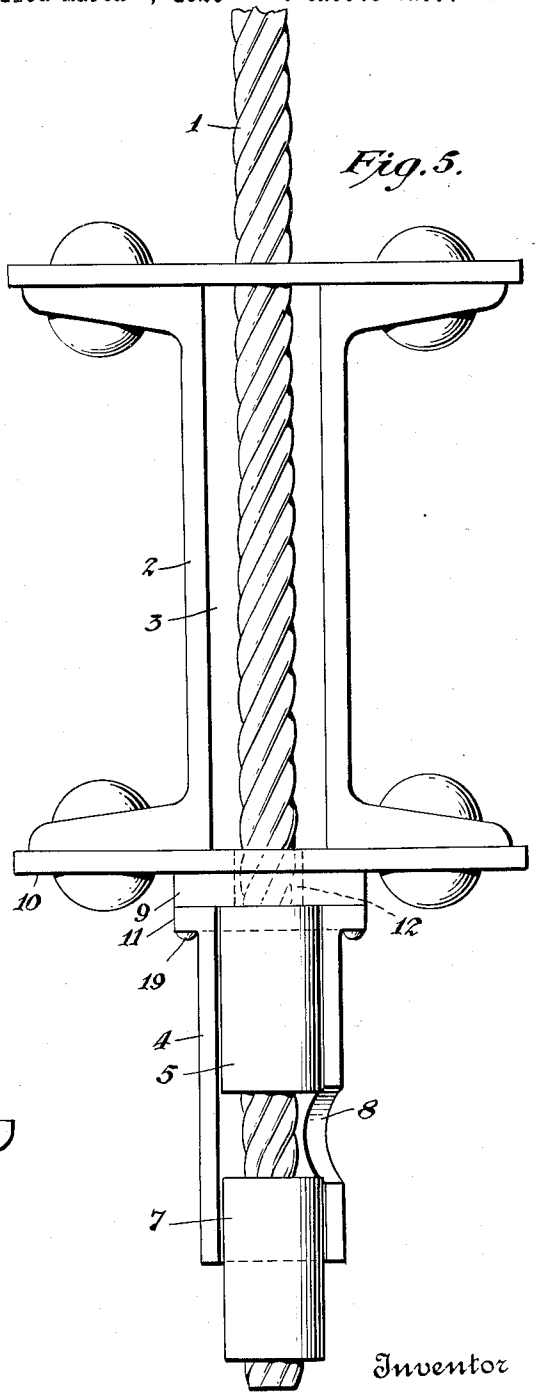


Fig. 5.



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Patented Dec. 25, 1928. 1,696,889

UNITED STATES PATENT OFFICE.

RUMSEY W. SCOTT, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO AMERICAN CABLE COMPANY, INC., A CORPORATION OF DELAWARE.

ATTACHMENT FOR WIRE ROPE.

Original application filed March 9, 1926, Serial No. 93,379. Divided and this application filed May 20, 1927. Serial No. 192,917.

This invention relates to appliances for testing the strength of attachments secured to wire ropes and is of particular utility when utilized for field tests of fittings attached to elevator ropes, although I contemplate the use of the invention wherever it may be employed advantageously by reason of the nature of my improvements. My present application is a division of my copending application, Serial No. 93,379 filed March 9, 1926.

No method is in use at the present day for proof-testing such attachments, but it is highly desirable that their latent defects should be detected, and serious accidents averted, for many fittings attached in the field to a wire rope are not 100% efficient, and some have developed a holding power of only 30% of the strength of the rope.

An important object of the invention, accordingly, is to provide permanent fittings which will lend themselves readily to the performance of such proof tests, for example those provided for in my aforesaid application, Ser. No. 93,379, and which will constitute in themselves a means for indicating any slippage of the attachment on the rope, and also auxiliary means for sustaining the load in the event of slippage of the primary attachment.

The above objects, and other features of the invention, will be illustrated and described fully in the accompanying drawings and specification and set forth in the claims.

In the drawings,

Fig. 1 is a view in side elevation of a testing appliance of the type disclosed in my aforesaid application, Ser. No. 93,379, the same being shown in its operative relation with a suitable operating press, and Fig. 1ª is an elevation of the testing device on a larger scale, showing also a section of elevator rope to be tested, the latter being provided with a fitting of improved construction to facilitate such testing, the fitting being constructed in accordance with the present invention.

Fig. 2 is a plan view of the testing device, isolated, and shown upon the same scale as Fig. 1ª.

Fig. 3 is a detail view on a larger scale in longitudinal section of the fitting shown in Fig. 1ª.

Fig. 4 is a view in transverse section on the line IV—IV of Fig. 3.

Fig. 5 is a view in longitudinal vertical section of the beam connection on an elevator car and showing also in elevation a wire rope forming part of the elevator rope, with an attachment embodying the fitting shown in Figs. 1ª and 3.

Fig. 6 is a view similar to Fig. 5 of a modified form of connection.

In the illustrated embodiment, the part designated by the reference numeral 1 is a wire rope of the type customarily employed for supporting an elevator car, and 2 (see Fig. 5) is an I-beam of composite structure, similar to those usually forming part of the top structure of the car, having a vertical opening 3 through which the elevator rope passes to a connecting device designated in its entirety by the reference numeral 4.

This connecting device may be of any construction suitable to effect connection between the wire rope 1 and the beam 2, and also to permit inspection of the fitting without displacing the wire rope from its operative position.

In the instance illustrated, as a convenient form of construction for the above purpose, I have shown at 4 what may be termed a flanged container comprising a cylindrical member of steel adapted to surround the lower portion of the wire elevator rope and having a central bore sufficiently large to permit the use upon the rope of an attachment sleeve 5 secured firmly upon the rope by any suitable method. I have illustrated as a now preferred form of attachment for this purpose a sleeve of the type shown in the patent to Arthur J. Briggs, No. 1,643,110 issued September 20, 1927, in which patent this sleeve is claimed generically, and is, therefore, claimed herein only in combination with other features of the present invention.

In Fig. 3, I have shown one of these sleeves in section, the reference numeral 5 designating the outer sleeve or member of the attachment, which may be, and preferably is, of steel, compacted upon a lining 6 of a relatively softer metal, such as aluminum, suitable to fill the peripheral interstices of the wire rope and to effect a very strong union of the attachment thereto.

In pursuance of my invention, I have provided the rope with an auxiliary sleeve or member 7, preferably similar in construction to the member 5 just described, and these two

sleeves are preferably spaced apart approximately at the distance illustrated in the drawings, the space between them being situated preferably opposite a side opening, 8, (see Fig. 5) formed in the walls of the container 4 to permit observation of the sleeves and the portion of the rope 1 therebetween for the purpose of determining whether or not there has been any relative slippage between the rope and its attachment. I have shown a washer of transverse member 9 interposed between the lower horizontal plate 10 of the I-beam 2, and the container 4, and the latter is preferably provided with a flange 11 the washer serving to distribute the load sustained by the wire rope, which passes through an aperture 12 in the washer of sufficient diameter to permit the rope to pass, but which is less in diameter than the exterior diameter of either of the sleeves 5 or 7, so that the sleeve 5 sustains the load of the I-beam and the car or any other structure which the wire rope is designed to support.

The cylindrical container serves to confine the enclosed portion of the rope and the sleeves, preventing any whipping action or lateral displacement, and I prefer to secure it rigidly in the position illustrated, by suitable means, such as the screws 19 running through the flange 11 and washer 9 into the plate 10.

If the car is over-loaded, or for any other reason the attachment sleeve 5 is subjected to a load which it was not designed to carry, or if the attachment has not been properly secured to the wire rope in the process of installation, the wire rope may slip in the attachment and the effect will be to draw the outer sleeve 7 inwardly with the rope, and the space between the sleeve 7 and the sleeve 5 will be lessened. This change may be readily detected by inspection through the opening 8.

If the slippage reaches a sufficient extent, the attachment member 7 will be brought into contact with the member 5, so that the load will be supported by the member 7, which has not slipped.

In order to detect the possibility of such slippages in the use of the wire rope, and thus to permit the same to be averted, my invention provides a novel method for proof-testing the efficiency of the fittings composed of the members 5 and 7, and in its preferred form this method is carried into effect by the use of an appliance which can be readily transported for use in the field.

The preferred appliance for this purpose comprises a pair of tongs of a design suitable to co-operate with the fittings above described, although any form of appliance suitable for this purpose may be utilized, and any suitable device for actuating the testing appliance may be provided.

The appliance shown in Figs. 1, 1ª and 2 comprises a pair of levers 21 and 22 adapted to work pivotally upon a fulcrum shaft 23, which takes the form of a bolt having retaining nuts 25 at each end thereof, the latter serving also as retaining means for links 26 on each side of the levers, these links being provided with studs 27 which enter slots or recesses 28 formed in the side faces of the levers 21 and 22 respectively.

Each of the levers has a jaw 29 recessed at 30 to seat one of the members 5 or 7 of the fitting hereinbefore described, and the jaws are grooved as indicated at 31 to furnish a clearance space for the wire rope 1, as shown clearly in Fig. 1ª. At the opposite end of the levers, arms 32 are provided preferably of suitable contour to fit between the jaws of a portable hydraulic press 33, the construction of which need not be described in detail as the specific structure illustrated is not essential for carrying the method into successful practice.

One of the jaws may be provided with a suitable device 34 to localize the contact of the arms with one of the jaws of the press, this device embodying a contact strip 35 adapted to co-operate with the contacting portion of the jaw of the press. A definite ratio between the lever arms is thus insured, and the lever arms 21 and 22 are of suitable proportions relatively to the operating arms 32 to reduce the pressure applied to the fittings 5 and 7 in a predetermined ratio corresponding to the desired factor of safety of the fitting.

When the proof-test is to be made in a shop, or in the field, before installation of the rope and its fitting, the rope and its fittings are inserted in the appliance as shown in Fig. 1, the proper pressure is developed in the press, and if the fitting members 5 and 7 hold their position upon the wire rope 1 when the critical stress is developed by this proof-test the efficiency of the fitting is assured.

If one or both of the fitting members 5 and 7 moves relatively to the wire rope before the critical stress is developed, it is possible to replace the sleeves by others and thus rectify the trouble without incurring any danger in the use of the rope and its fittings, as for example in the operation of an elevator.

The testing appliance may be utilized with even greater utility where the rope has been installed in connection with the elevator as illustrated and described with reference to the structure shown in Fig. 5.

It is only necessary in making a proof-test under such conditions to let off enough wire rope 1 to permit the portion of the rope carrying the fitting members 5 and 7 to be withdrawn from the flanged container 4 to an extent sufficient to permit introduction of the jaws 29 of the tester in the space intervening between the fittings 5 and 7, and after the proof-test has been completed, the rope and its fittings 5 and 7 may be drawn back into the position shown in Fig. 5 ready for

further use if the attachment has met the proof-test.

If one or both of the fittings should part, the attachment members may be removed and replaced by attachments suitably strong to bear the load required, as already mentioned above.

The above disclosed method and appliance are claimed in my aforesaid application Serial No. 93,379, and accordingly are not claimed specifically herein.

I have shown in Fig. 6 a modified form of connection suitable for installations of a similar character, and only differing in detail of construction from that shown and described with reference to Fig. 5.

In the embodiment illustrated in Fig. 6 the wire rope 1 and the attachment members 5 and 7 are similar in every detail to those shown and described with similar reference numerals in the above description. The numeral 20 indicates the structure of a composite I-beam which is sufficiently similar to the I-beam 2 not to require detailed description. The member 19 is a bolt upon which is formed integrally a socket 36 having a basket 37, slotted at 38 to receive the wire rope 1, and having grooved inner walls as indicated by dotted lines at 39 to form a space sufficiently large to receive the attachment sleeve 5 when the device is in place.

The opening 40 of the bale 36 of the socket is sufficient in size to afford clearance for the attachment member 7 and to facilitate the operation of inserting the rope and its attachments in place within the socket.

The assembled parts just described operate in exactly the same manner as those described with reference to Fig. 5, and any slippage of the wire rope within the member 5 may be readily detected by the diminution of the space between the neighboring ends of the members 5 and 7.

While I have shown a tester of preferred form, and also fittings of a particularly desirable character, it is to be understood that I do not limit myself to the specific structure and materials selected for illustration and description.

I claim:

1. An attachment for wire rope, said attachment comprising a primary member secured permanently to the rope and adapted to sustain the stress of loads to which the rope is subjected, and means to indicate relative movement between said rope and member, said indicating means including an auxiliary member also secured to the rope in proximity to said primary attachment member.

2. An attachment for wire rope, said attachment comprising a primary member secured permanently to the rope and adapted to sustain the stress of loads to which the rope is subjected, and means to indicate relative movement between said rope and member, said indicating means including an auxiliary member also secured permanently to the rope in proximity to said primary attachment member.

3. An attachment for wire rope, said attachment comprising a primary member secured to the rope against axial movement in each direction thereon and adapted to sustain the stress of loads to which the rope is subjected, and means to indicate relative movement between said rope and member, said indicating means including an auxiliary member also secured to the rope in proximity to said primary attachment member and normally separated therefrom by a space which is diminished when said relative movement occurs between the rope and attachment member, said auxiliary member also being adapted to resist displacement axially in each direction along the rope.

4. An attachment for wire rope, said attachment comprising a primary attachment member secured to the rope and adapted to sustain the stress of loads to which the rope is subjected, and means to indicate relative movement between said rope and member, said indicating means including an auxiliary attachment member secured to the rope in spaced relation to said primary load-supporting member, and adapted to serve as a secondary load-supporting member in the event of relative movement between the rope and said primary member sufficient to bring said secondary member into action.

5. An attachment for wire rope, said attachment comprising a plurality of attachment members secured to said rope and adapted respectively to sustain the stress of loads to which the rope is subjected, one of said members serving to support said load when the other member fails so to do.

6. An attachment for wire rope, said attachment comprising a plurality of attachment members secured to said rope and adapted respectively to sustain the stress of loads to which the rope is subjected, one of said members serving to support said load when the other member fails so to do, said members being so secured to the rope in spaced relation to each other, that the diminution of the intervening space serves to indicate said failure.

In testimony whereof, I have signed this specification.

RUMSEY W. SCOTT.