

(No Model.)

S. TROTT & H. KINGSFORD.

GRAPNEL FOR RAISING TELEGRAPHIC CABLES.

No. 265,720.

Patented Oct. 10, 1882.

Fig. 1.

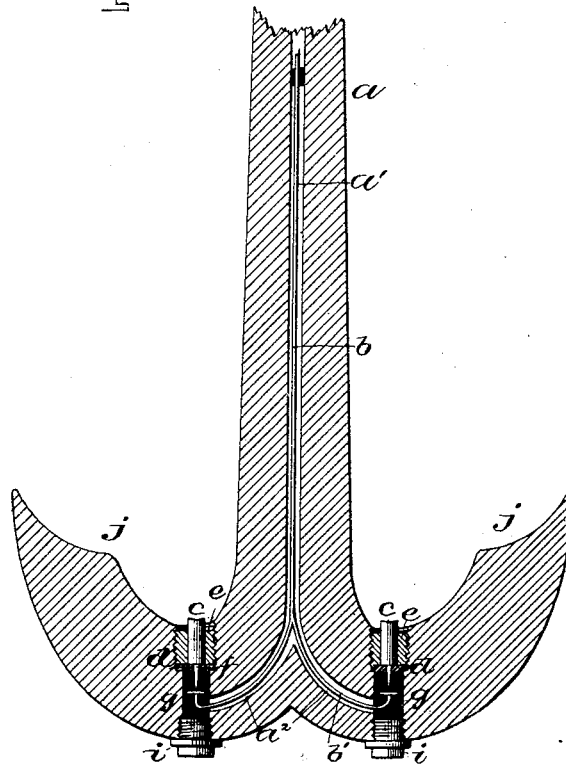
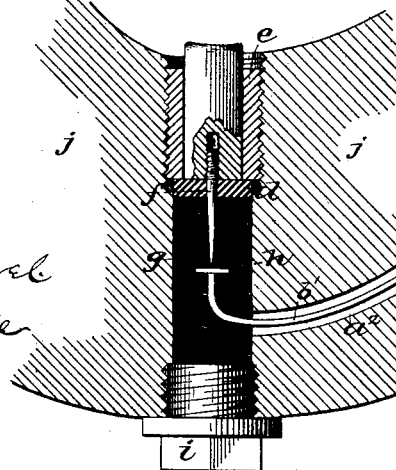


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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GRAPNEL FOR RAISING TELEGRAPHIC CABLES.

SPECIFICATION forming part of Letters Patent No. 265,720, dated October 10, 1882.

Application filed April 27, 1882. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL TROTT and HERBERT KINGSFORD, both of Halifax, in the county of Halifax and Province of Nova Scotia, Dominion of Canada, have invented a new and useful Improvement in Grapnels; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to grapnels used in lifting submarine telegraph-cables and torpedo-works, and other operations of like nature, and is so constructed and arranged that the presence of the cable on the grapnel will be immediately indicated by electrical means at any desired distance or depth, the pressure of the cable on the grapnel causing such indication to be given.

Heretofore delicate dynamometers have been employed to show the presence of submarine telegraph cables when hooked on the grapnel; but they generally fail to do so until some time after said cable is hooked, especially when a considerable amount of slack rope has to be paid out, owing to the great depth of the water or the nature of the bottom of the ocean. In many cases the grapnel, after hooking the cable, will travel with it long distances before the slightest indication or least reliable information occurs in the dynamometer, and perhaps several miles of the line of cable will be dragged fruitlessly, and very often to the peril of neighboring cables; but should the engineer be advised of the immediate presence of the cable in the grapnel the break, which often occurs, would be avoided, and the exact position of the cable would be ascertained.

The nature of our invention consists in arranging, in the curved parts of the flukes of a grapnel, a movable sliding block, which, when the cable is hooked, will close a circuit with a wire passing through the grapnel, and thereby cause a bell to ring on the vessel, and thus give an instantaneous signal that the cable is hooked.

In the drawings, Figure 1 represents a sectional view of a grapnel containing our improvements. Fig. 2 shows an enlarged sectional view of a fluke thus provided.

Similar letters of reference indicate like parts.

In Figs. 1 and 2 the grapnel has bored through

the entire length of its stem *a* a hole, *a'*, which carries in it an insulated conductor, *b*, which is formed of wires *b'*. At the point *V* these wires branch to one or more prongs or flukes, *j*, one wire for each of the flukes or prongs the grapnel is composed of. These prongs or flukes have also bored through them holes *a''*, which correspond with hole *a'* in the grapnel-stem, and into which the wires *b'* are led, and are there embedded in any insulating elastic material or spring, *g*, and terminate in a conducting-surface, *h*. A washer, *d*, is placed on the top of spring *g*, and this washer has a hole in its center which allows of the passage of the pin *f* in connection with plug *e*. This plug works in the hollow part of the compressing-screw *c* and closes the upper opening of the cavity in the prong or fluke, and the screw *i* closes the lower opening. The pin *f* is screwed in the plug *e*, and it can be lengthened or shortened at will in order to facilitate, in conjunction with screw *c*, the adjustment of any pressure. In some cases we may use a guard to protect the plugs from the pressure of ooze and such solid bodies as rock and pebbles.

The operation of our invention is as follows: When the cable is hooked its pressure on plug *e* will compress the elastic material or spring *g*, and will cause the pin *f* to come in contact with the conducting-surface *h*, thereby completing a circuit and causing work to be done, such as the ringing of a bell or the deflection of a needle, thus giving a signal that the cable is hooked.

The grapnel-rope may carry in its core the connecting-wires; or the wires may be paid out independent of the grapnel; but we prefer the former.

It will of course be understood that the device is to be used in connection with a battery or electrical apparatus capable of producing a current to pass through the line *b b'*, the circuit being completed either by a second wire, or, as is more convenient, through the water. The elastic packing or spring *h* and the washer *d*, fitting closely around the pin *f*, prevent the entrance of water between the point *f* and contact-plate *h*, which would establish a circuit and cause the signal to be given without proper cause.

We are aware that a sliding bar has been ar-

ranged at the bow or point of a torpedo-boat to establish connection between contact-plates and perfect an electric circuit to explode the charge; and we are also aware that it has been
 5 proposed to connect a hook with an electric conductor in such manner that when a sufficient strain is brought upon the hook it shall draw the two contact-points together and complete the electric circuit for certain purposes.
 10 These we do not claim. By our plan the circuit is completed only when an object becomes engaged with the flukes or arms of the grapnel, and then without the application of any considerable force, which for the purposes of this
 15 invention should be avoided.

We claim—

1. A grapnel provided with a movable plug extending outward through the fluke or arm of the grapnel, and with an electric contact-plate
 20 in connection with a signal, substantially as explained, whereby the engagement of the fluke or arm with a body is caused to press the plug inward and complete the circuit, thereby operating the signal.

25 2. The herein-described grapnel, consisting of a body having arms or flukes, one or more of said arms containing an insulated contact-plate in electric connection with a signal, and a yielding or spring-sustained plug held nor-

mally out of contact with said plate, but extending outside of the arm, and adapted to be pressed inward by contact with bodies against which the grapnel is drawn, and thereby to complete the circuit and cause the operation of the signal.

3. The herein-described grapnel, consisting of body *a*, insulated conductor *a'*, contact-plate *h*, plug *C*, having point or needle *f*, and spring *g*, all combined and operating as set forth.

4. In a grapnel substantially such as described and shown, the combination of insulated conductor *a'*, contact-plate *h*, elastic packing *g*, plug *C*, having point or needle *f*, washer *d*, and tubular threaded plug *e*, all arranged substantially as shown and described.

5. In combination with contact-surface *h* and spring *g*, plug *C*, having threaded stem or pin *f*, adapted to be screwed in or out to lengthen or shorten the distance between its point and the contact-surface *h*, as explained.

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