2 Sheets—Sheet 1.

J. B. TOSELLI.

SELF-ACTING GRAPNEL.

No. 174,448. Patented March 7, 1876.

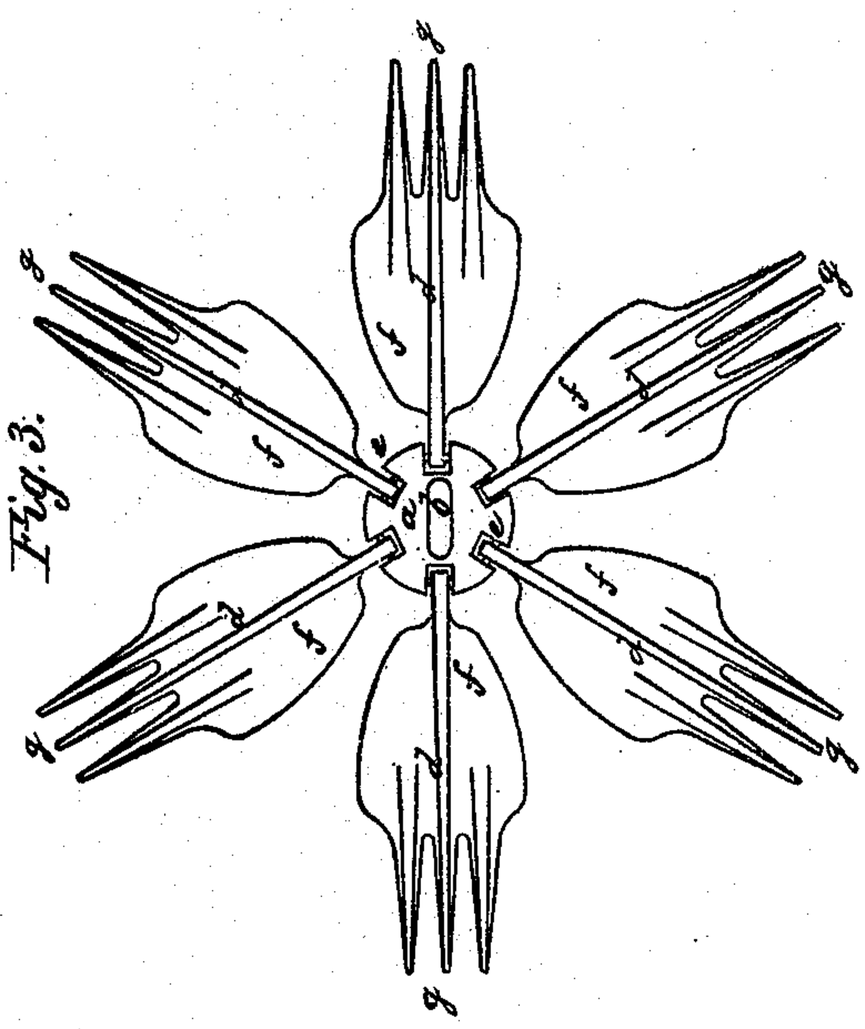

Fig. 3.

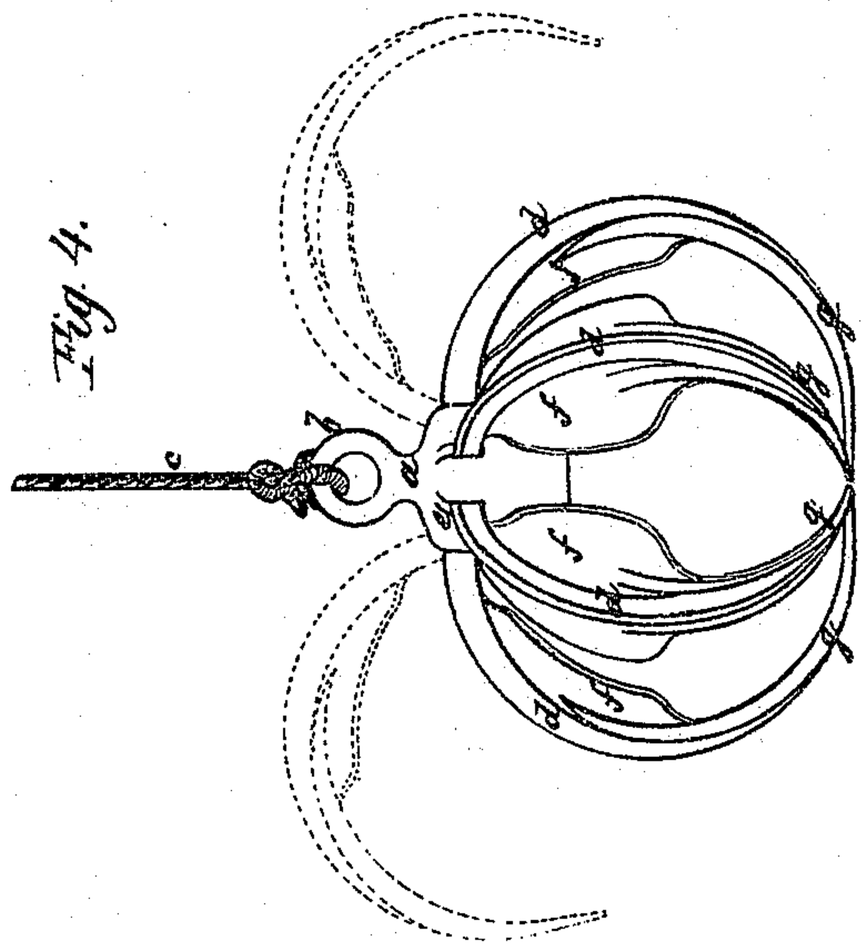

Fig. 4.

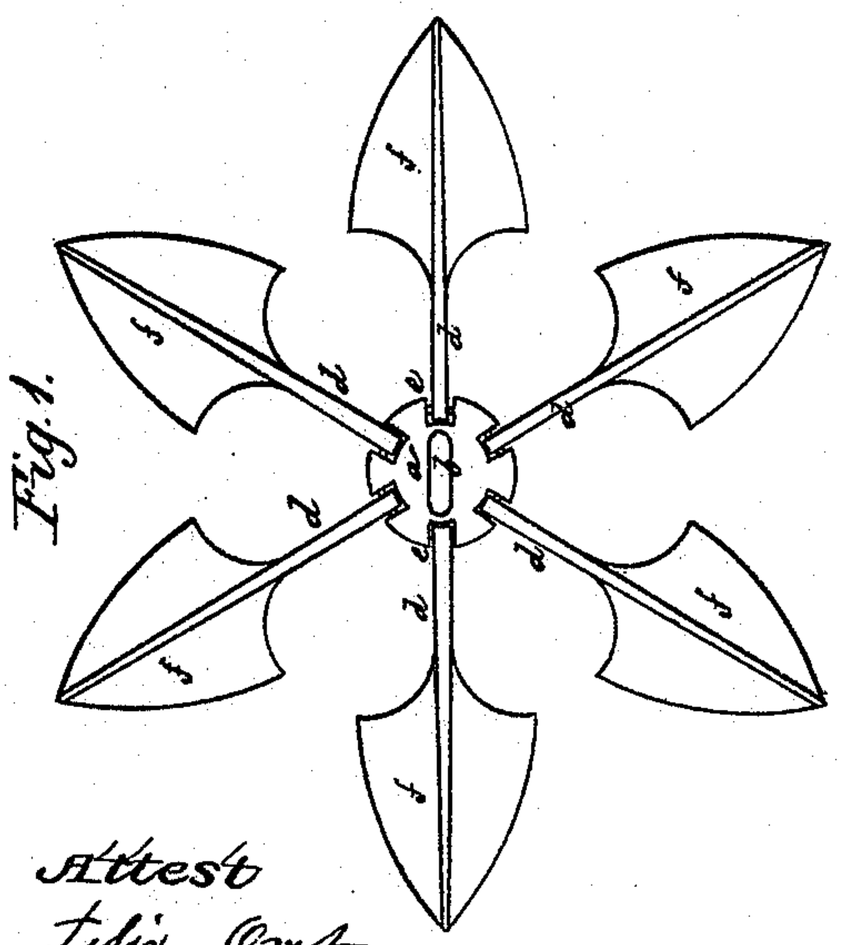

Fig. 1.

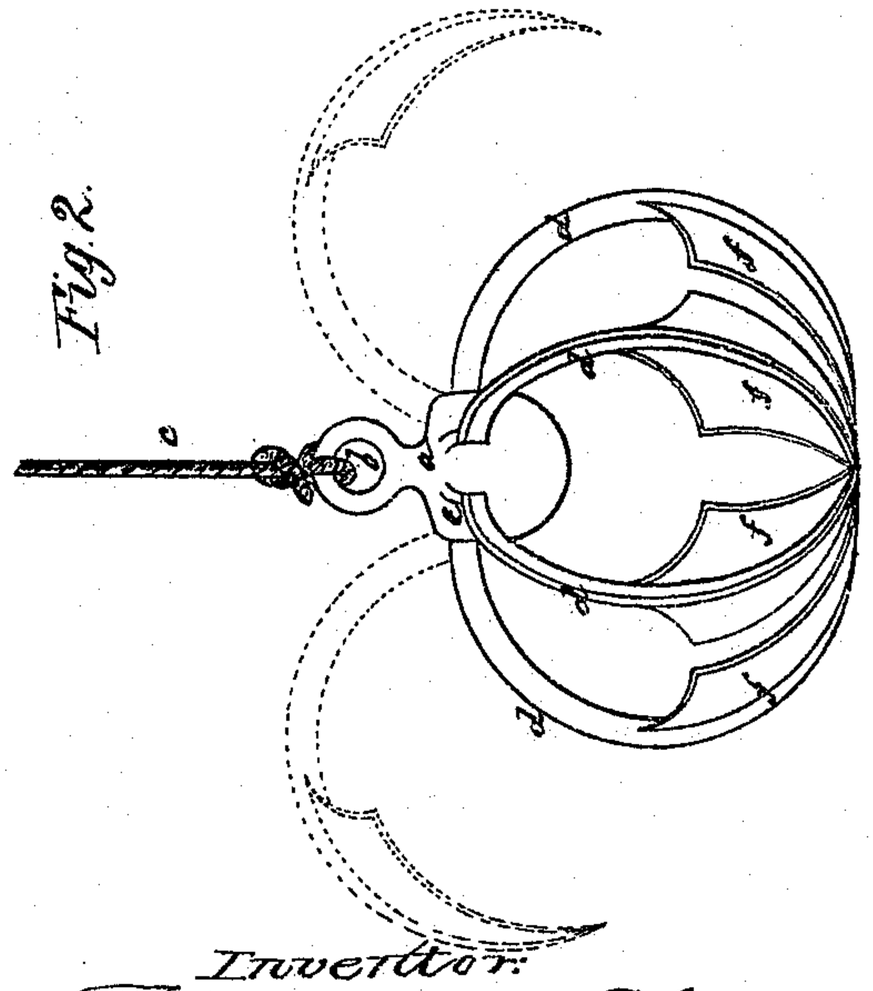

Fig. 2.

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Felix Orat

Robt. A. Hayes

Inventor:
Jean Baptiste Toselli

2 Sheets—Sheet 2.

J. B. TOSELLI.

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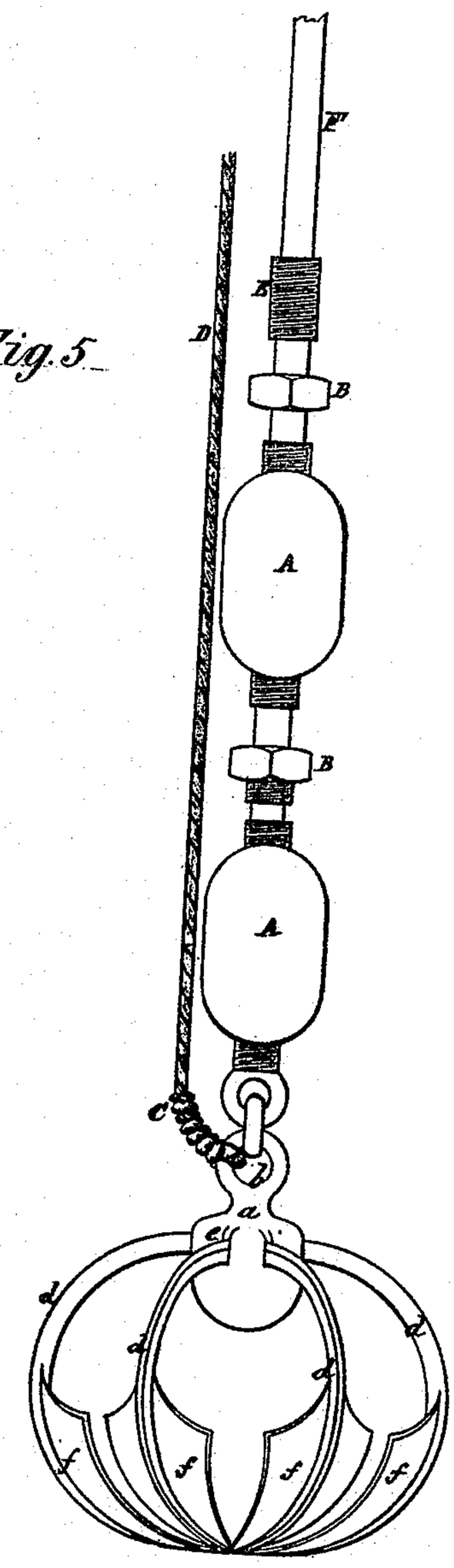
Fig. 5



Witnesses:

Felix Orez

Paul Abbott Brown

Inventor:

Jean Baptiste Toselli

UNITED STATES PATENT OFFICE.

JEAN BAPTISTE TOSELLI, OF PARIS, FRANCE.

IMPROVEMENT IN SELF-ACTING GRAPNELS.

Specification forming part of Letters Patent No. **174,448**, dated March 7, 1876; application filed February 5, 1876.

To all whom it may concern:

Be it known that I, JEAN BAPTISTE TOSELLI, of Paris, France, have invented an Improved Automatic Grapnel for recovering submerged objects from the bottom of the sea, lakes, and rivers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed sheet of drawings, making a part of the same.

My invention relates to an improved automatic grapnel for recovering submerged objects from the bottom of the sea, lakes, and rivers.

The distinctive feature of the improved grapnel of this invention is that it is expanded and closed automatically by the mere resistance of the water.

These improved grapnels may be constructed in two ways. According to one arrangement the grapnel is expanded by being suddenly raised while immersed in the water. The second arrangement, on the other hand, is made to expand by the act of lowering in the water, but in both cases the resistance of the water is the agent by which the arms of the grapnel are caused to expand or close together without any mechanical aid, as will be readily understood by reference to the accompanying drawings.

Figure 1 shows a plan of one arrangement of my improved grapnel with the arms expanded, while Fig. 2 is a vertical elevation of the same with the arms hanging together.

a, boss of the grapnel, having an eye or ring, *b* for attaching the rope *c*, by which the grapnel is suspended; *d*, grapnel-arms, in any convenient number, disposed equidistantly around boss *a*, to which they are jointed at *e*. The said arms are curved in such manner as to resemble, when the whole are hanging together, a kind of skeleton sphere, as seen in Fig. 2, the said arms being furnished with flukes or palms *f*, resembling those of an anchor. In the one arrangement, shown in Figs. 1 and 2, these palms are at the extremities of the arms, while in the second arrangement they are near the boss of the grapnel.

The grapnel shown in Figs. 1 and 2 is expanded and closed in the following manner: The grapnel is lowered to the bottom with the arms in the closed position, Fig. 2, and when over the object to be raised the arms are caused to expand by a sudden pull on rope *c*, whereupon the resistance of the water within the arms, acting on the palms *f*, will tend to open out or expand the arms, as shown in Fig. 1, and in dotted lines in Fig. 2. On again lowering the grapnel the arms fall inward by their own gravity, and when they have grasped the object to be raised, the grapnel may be slowly brought to the surface.

Fig. 3 shows a plan, and Fig. 4 an elevation, of the second arrangement of my improved grapnel. The same reference-letters are used as in Figs. 1 and 2 to indicate the same parts.

As will be seen from the drawing, this arrangement only differs from the foregoing as regards the position of the palms or blades *f*, which in this case are placed near the jointed ends *c* of arms *d*. The resistance of the water thereon acts in the reverse manner to the foregoing, inasmuch as, on lifting the grapnel by the rope *c*, the volume of water comprised within the arms opposes no such resistance to arms *d* as would cause them to expand, but on lowering the grapnel the resistance of the water opposes the descent of the palms or blades *f*, and thus causes the arms to expand, as indicated in dotted lines.

It will be evident that these improved grapnels may be made of all sizes, and of proportionate strength, but when a heavy object is grappled it is necessary to have the means at hand for raising it. In the absence of other means this result is obtained in a very simple manner by attaching to the grapnel (see Fig. 5) a chain of expanding air-bags, A A, of suitable size, made of strong canvas or other material, which has been rendered air-tight. These air-bags A A are united together by metal unions B B, securely attached to the same.

In order to raise a heavy object from a great depth, the grapnel is lowered together with a number, more or less, of these air-bags, connected in the form of a chain, whose upper end is placed in communication with an air-pump by an india-rubber pipe, E F. This tube is accompanied by a rope, C D, of sufficient strength to support the weight of the chains

and of the apparatus, so that no strain liable to break the tube E F shall be borne by the same. After grappling the object, the air-bags A A are inflated, and displace a proportionate amount of water, until the object is lifted from the bottom. When the air-bags arive at the surface of the water, the object held in suspension, as it were, is secured and transported into shallower water.

I claim—

1. A grapnel provided with pivoted or jointed arms, having flukes or palms arranged as described, so that the arms are made to open or close from the mere resistance of the water when the apparatus is raised or lowered, as the case may be, as and for the purpose described.

2. The combination, with a grapnel, having a supporting-cord, C, of a chain of air-bags, A, having hollow metallic connections B, as and for the purpose described.

JEAN BAPTISTE TOSELLI.

Witnesses:
FELIX ORET,
ROBT. M. HOOPER.