

No. 669,276.

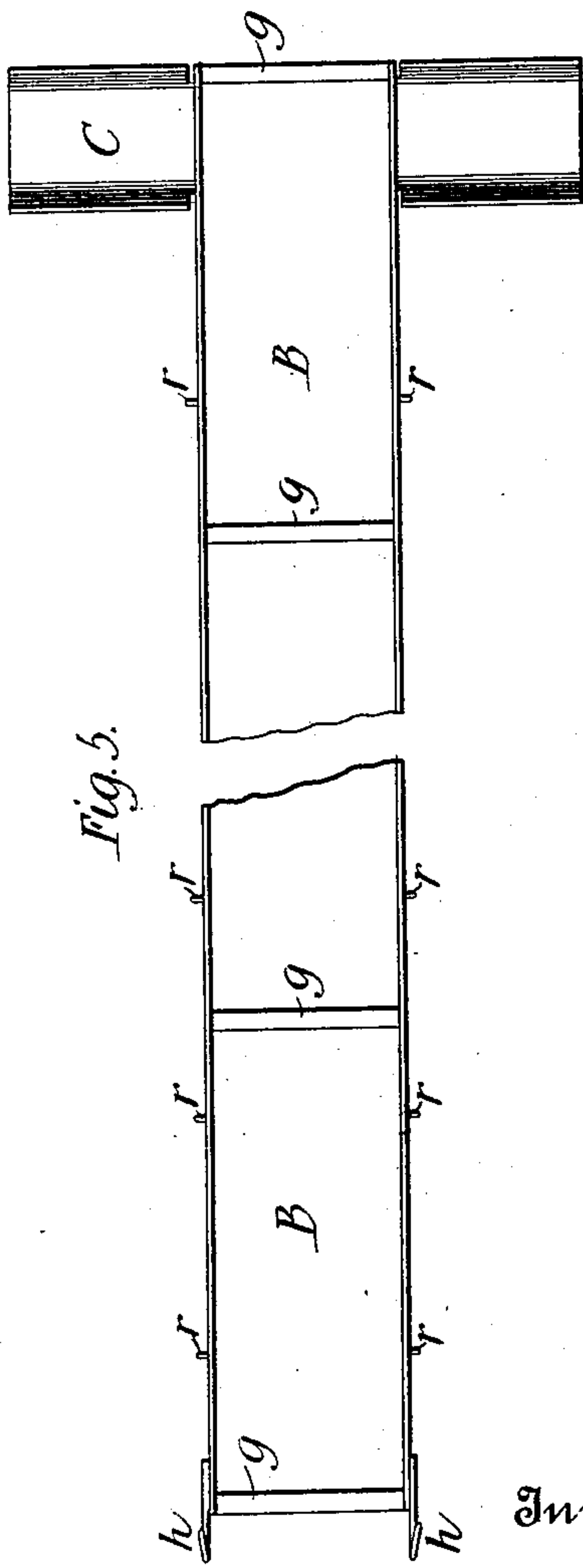
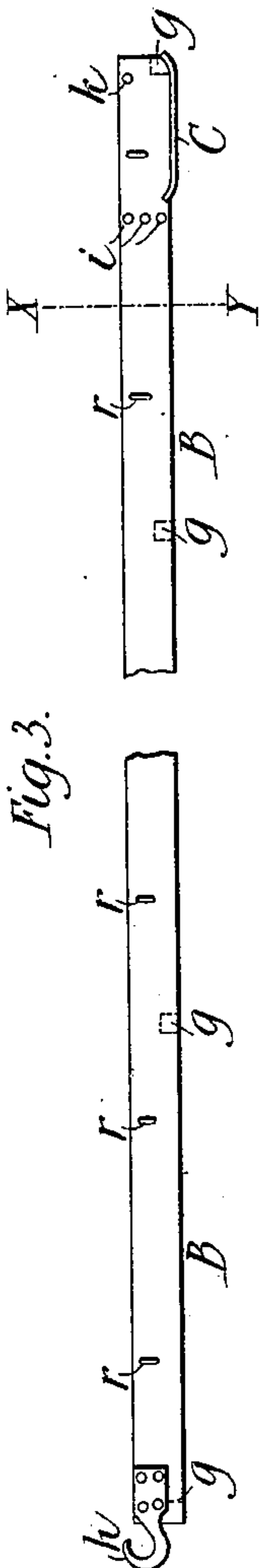
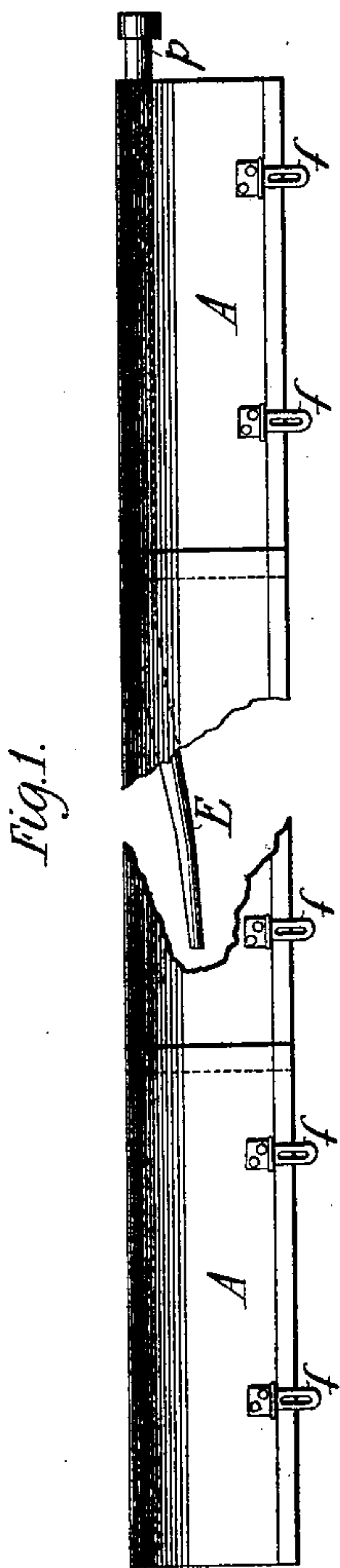
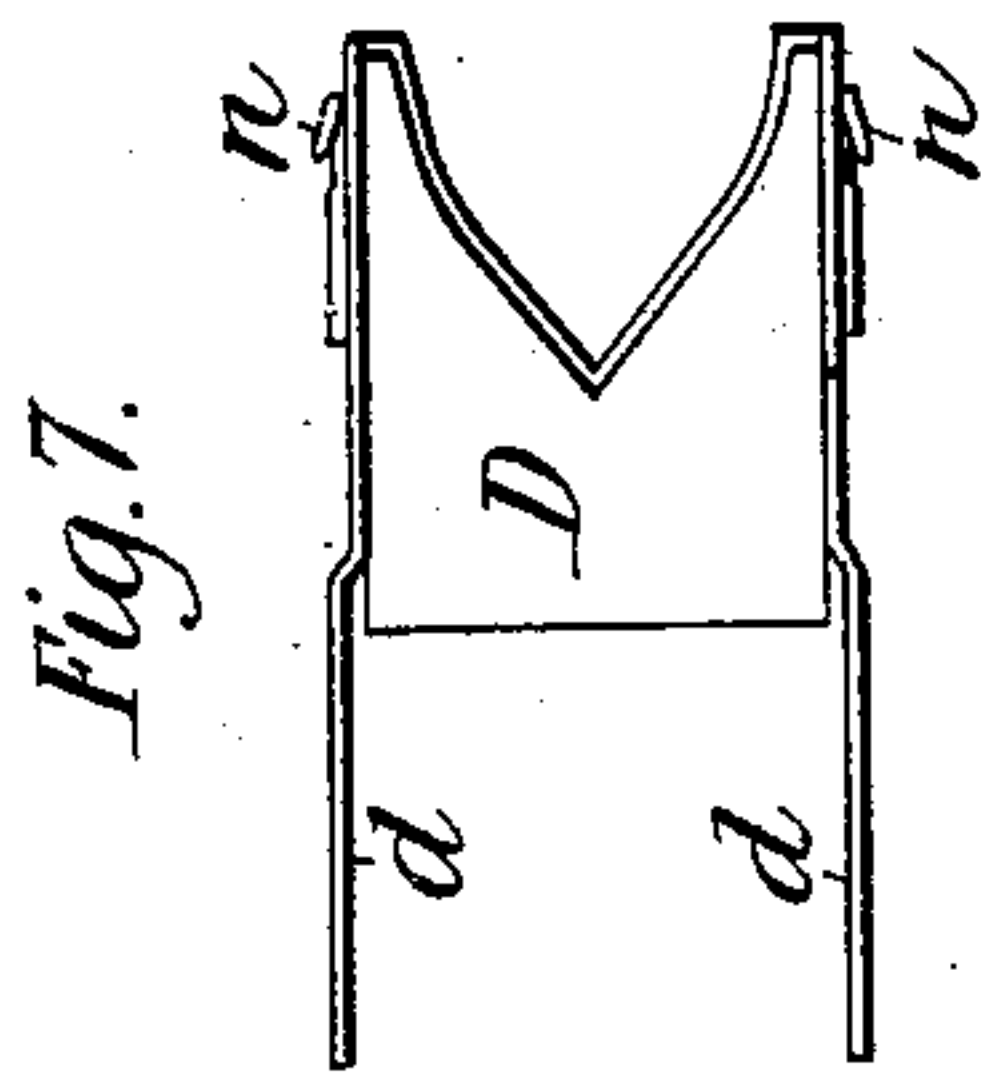
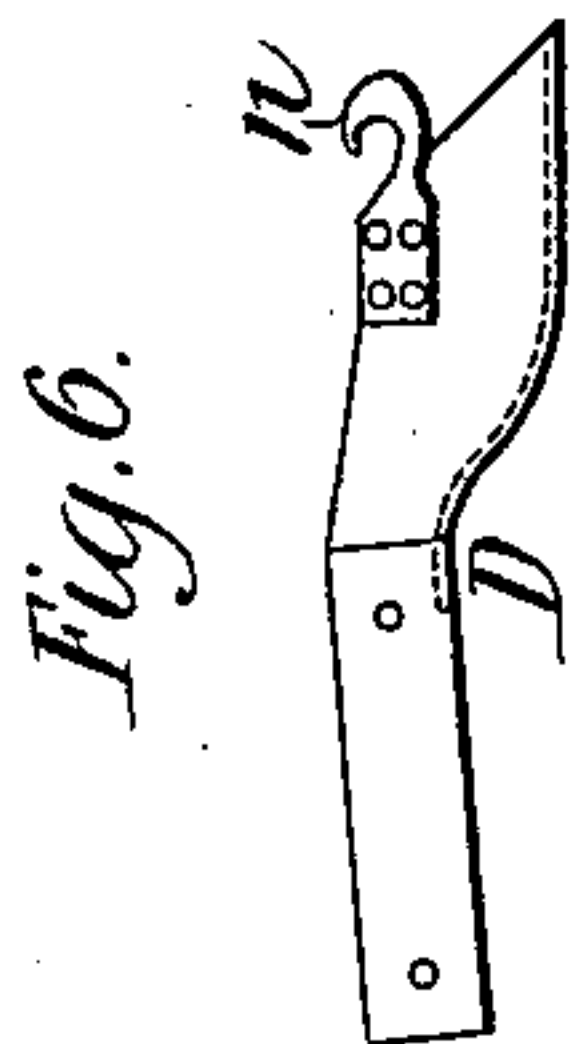
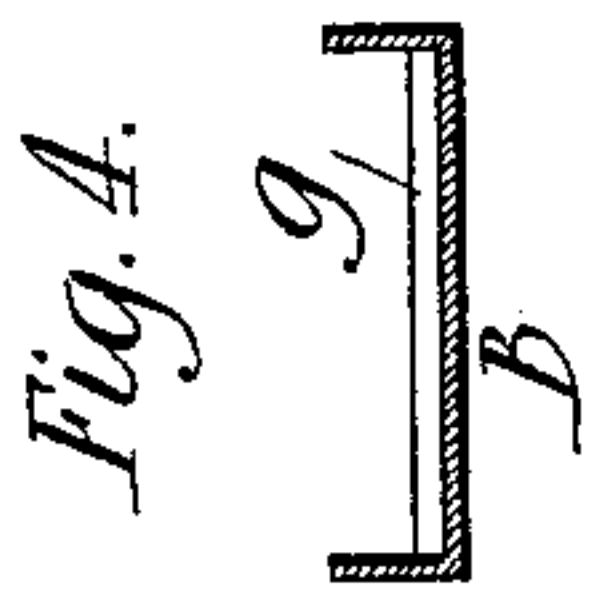
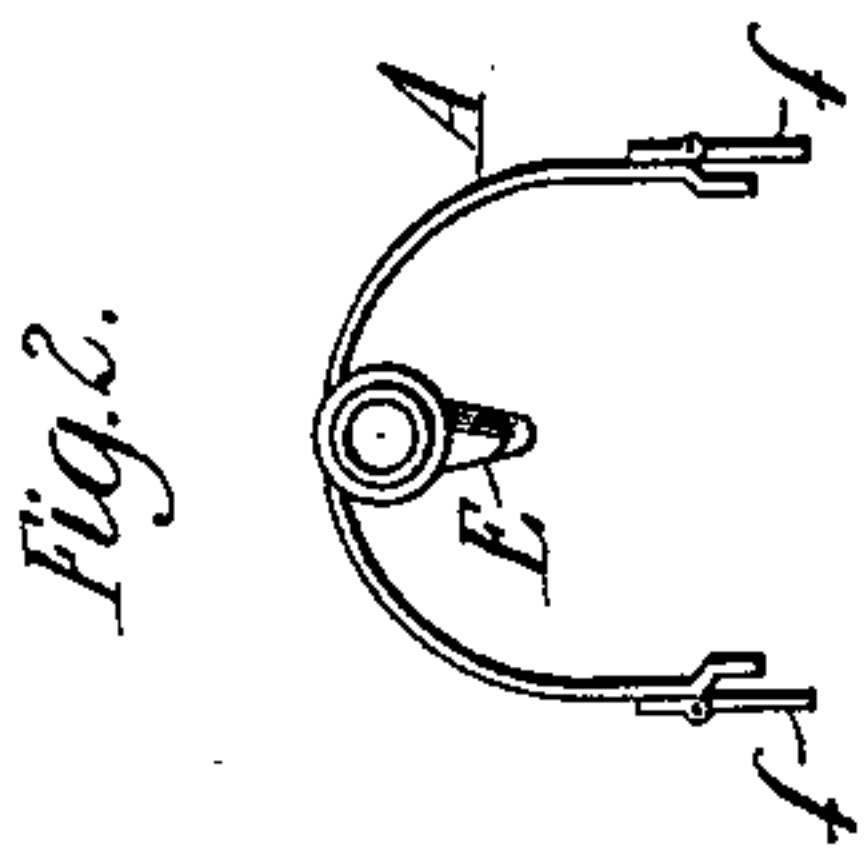
Patented Mar. 5, 1901.

A. ALLEN.
SUBMARINE MINING MACHINE.

(Application filed Jan. 2, 1900. Renewed Aug. 7, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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2 Sheets—Sheet 2.

Fig. 8.

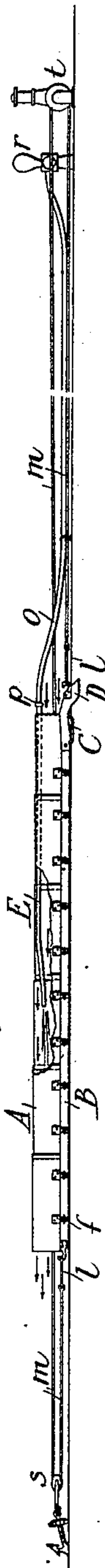
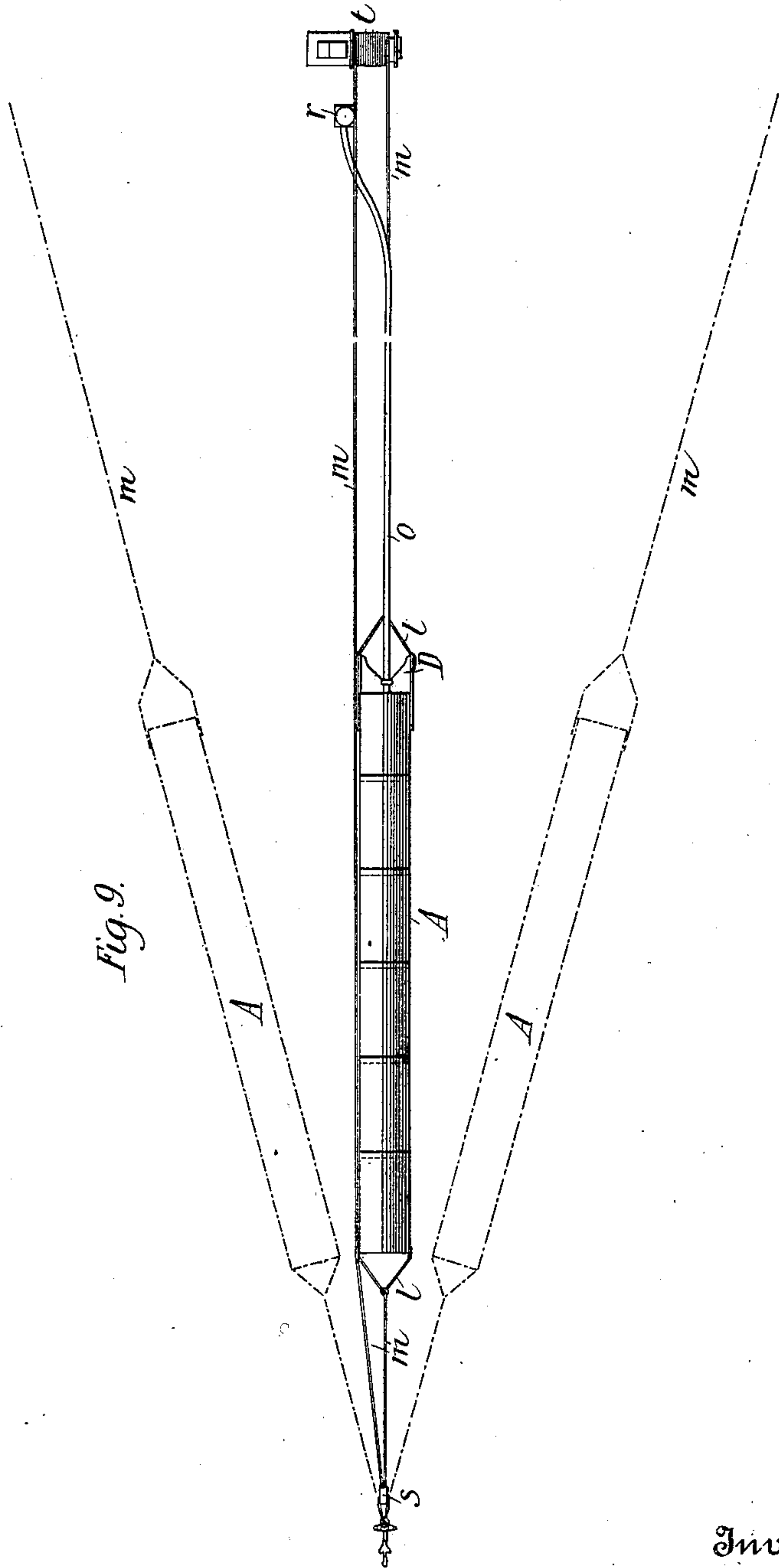


Fig. 9.



Witnesses

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ALBERT ALLEN, OF SPOKANE, WASHINGTON.

SUBMARINE MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 669,276, dated March 5, 1901.

Application filed January 2, 1900. Renewed August 7, 1900. Serial No. 26,113. (No model.)

To all whom it may concern:

Be it known that I, ALBERT ALLEN, a citizen of the United States, residing at 604 Rookery Building, Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Submarine Mining-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to mining-machines, and has for its object the production of an improved appliance by the operation of which gold-bearing sands and gravels are excavated and mined under water to effect the separation therefrom of the contained precious metals.

The improved machine is designed for employment in extracting precious metals, more especially gold, from sands and gravels in the beds of rivers, lakes, and ocean-beaches, and to this end mechanism is provided by which the sand and gravel, in lieu of being hoisted to the surface and treated for the extraction of the precious contents, are subjected while submerged to the disintegrating action of an induced water-current, whereby the gold particles, free from gangue, are collected and the disassociated material discharged below the surface.

The nature of the invention will be readily comprehended when reference is had to the following detailed description and to the accompanying drawings, in which—

Figure 1 is an elevation, partly broken away, of the upper portion of a sluice-box embodying the invention; and Fig. 2 is an end view of the same. Fig. 3 is an elevation of the bottom of the box; and Fig. 4, a sectional view on line X Y, Fig. 3. Fig. 5 is a top plan view of said bottom. Figs. 6 and 7 are respectively side and top views of the scraper at the receiving end of the box. Fig. 8 is a view in elevation, slightly reduced, of the assembled machine, showing a means for dragging it over subaqueous bottoms. Fig. 9 is a plan view of the machine, showing a means for dragging it and illustrating the preferred manner in which the machine is moved laterally to treat new areas.

Referring to the said drawings by letter, A denotes the upper portion of a sluice-box, which portion is preferably of arch form in

cross-section and is reduced at its lower end to fit snugly within the sides of the base B, to which it is secured by any suitable devices, such as the pivoted hasps *f* on the part A and the staples *r* on the base, through which staples are passed spring-cotters, as shown in Fig. 8.

At the forward end of the box is a scraper D, having arms *d*, which are adjustably secured to the base B. Pins or bolts passed through the arms *d* into holes *k* in the base sides afford pivots for the scraper, and the adjustment of pitch of the latter is effected by pin or bolt connection with the series of holes *i* in the base sides. The box is in practice drawn along the sand-and-gravel bed, and in its forward movement the scraper enters the sand and gravel, the depth of entry being governed by the pitch or degree of inclination of the scraper, as will be understood. To prevent too deep entry of the scraper, I provide at each side of the base B, to the rear of the scraper, a fender-plate C, the forward and rearward edges of which are upturned. These plates C, in addition to limiting the depth of entry of the scraper, prevent the box from tilting and transfer the wear from the bottom of the base.

On the base B, between its sides, are transverse cleats *g*, which serve as a convenient means for mounting gold-saving devices—such as riffles, amalgamating-plates, and the like.

E denotes a water-discharge pipe which is supported in the upper portion of the box. This pipe, which is connected to a water-supply pipe *o* by means of a coupling *p*, extends well within the box, and, the pipe *o* being connected with a suitable pump *r*, water under pressure is discharged forcibly at the nozzle end of the pipe E, with the result of inducing a water-current through the box by reason of the tendency to a vacuum thus formed, the direction of the current being indicated by arrows in Fig. 8.

In practicing the invention there is anchored in the river, lake, or ocean bed a pulley or sheave *s*, around which is passed a rope or chain *m*, the ends of the rope or chain being secured to rope or chain bridles *l*, secured to hooks *h* and *n*, bolted or riveted respectively to the rear end of the box and to the scraper. Intermediate of its ends the rope

or chain *m* is coiled around a capstan or drum *t*, mounted on shore or on an anchored barge, and steam or other power being applied to the capstan or drum the box is first drawn outward in the direction of the anchored pulley. The capstan or drum is now revolved in the reverse direction and the box is drawn in toward the shore, and at the same time the pump is operated to produce the discharge of water under pressure at the nozzle of pipe E. In the inward travel of the box the scraper plows up the sand and gravel to a predetermined depth and the material is carried into and through the box by the movement of the latter, aided by the strong water-current induced by the discharge at the nozzle, which water-current also operates to disintegrate the material and hold it in suspension, the heavier precious particles falling on the box-base, where they are caught and retained by the riffles. The material under the action of the induced water-current passes through the box and is continuously discharged at the rear end, there being no accumulation other than the recovered precious particles. The pressure of water in the pipe E governs the velocity of the current, and the adjustment of said pressure will depend upon the conditions present—such, for instance, as the nature of the sand and gravel and the size and weight of the gold particles. By moving the capstan or drum after each operation a considerable area of sand and gravel may be treated, after which the position of the anchored pulley will need to be changed to provide a new field upon which to work.

The box is preferably built of metal, the upper portion being of relatively lighter material and made in sections, as shown.

I claim as my invention—

1. A submarine mining-machine comprising an open-ended sluice-box adapted to rest throughout its length on and be dragged along a subaqueous bottom, a scraper at the forward end delivering the material of the bottom directly into the box, a compressed-water-jet pipe discharging into the box toward its rear to induce a current therethrough, means in the box receiving and retaining the precious particles separated from the material in its passage, and means for dragging the box backward and forward along the bottom, the box in its forward movement receiving, separating and discharging the material under water.

2. A submarine mining-machine comprising an open-ended sluice-box adapted to rest throughout its length on and be dragged along a subaqueous bottom, a scraper adjustably secured to the forward end of the box to deliver directly thereto the material of the bottom, a compressed-water-jet pipe discharging into the box toward its rear to induce a current therethrough, riffles or the like in the bottom of the box receiving and retaining the precious particles separated from the material in its passage, and means for dragging

the box backward and forward along the bottom, the box in its forward movement receiving, separating and discharging the material under water.

3. A submarine mining-machine comprising an open-ended sluice-box having an upper or cover portion and a base portion removably secured together, said box adapted to rest throughout its length on and be dragged along a subaqueous bottom, a scraper at the forward end of the box forming a continuation of the base and operating to deliver the material of the bottom directly into the box, a compressed-water-jet pipe discharging into the box toward its rear to induce a current therethrough, devices in the base receiving and retaining the precious particles separated from the material in its passage, and means for dragging the box backward and forward along the bottom, the box in its forward movement receiving, separating and discharging the material under water.

4. A submarine mining-machine comprising an open-ended sluice-box having an upper or cover portion formed in sections and a base portion removably secured together, said box adapted to rest throughout its length on and be dragged along a subaqueous bottom, a scraper adjustably mounted at the forward end of the box to form a continuation of the base and operating to deliver the material of the bottom directly into the box, a compressed-water-jet pipe discharging into the box toward its rear to induce a current therethrough, riffles or the like in the base receiving and retaining the precious particles separated from the material in its passage, and means for dragging the box backward and forward along the bottom, the box in its forward movement receiving, separating and discharging the material under water.

5. A submarine mining-machine comprising an open-ended sluice-box having an upper cover portion and a base portion removably secured together, said box adapted to rest throughout its length on and be dragged along a subaqueous bottom, a scraper adjustably secured to the forward end of the box to form a continuation of the base and operating to deliver the material of the bottom directly into the box, fender-plates on the base at each side of the scraper, a compressed-water-jet pipe discharging into the box toward its rear to induce a current therethrough, riffles or the like in the base receiving and retaining the precious particles separated from the material in its passage, and means for dragging the box backward and forward along the bottom, the box in its forward movement receiving, separating and discharging the material under water.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT ALLEN.

Witnesses:

W. T. NORTON,
F. L. BROWNE.