

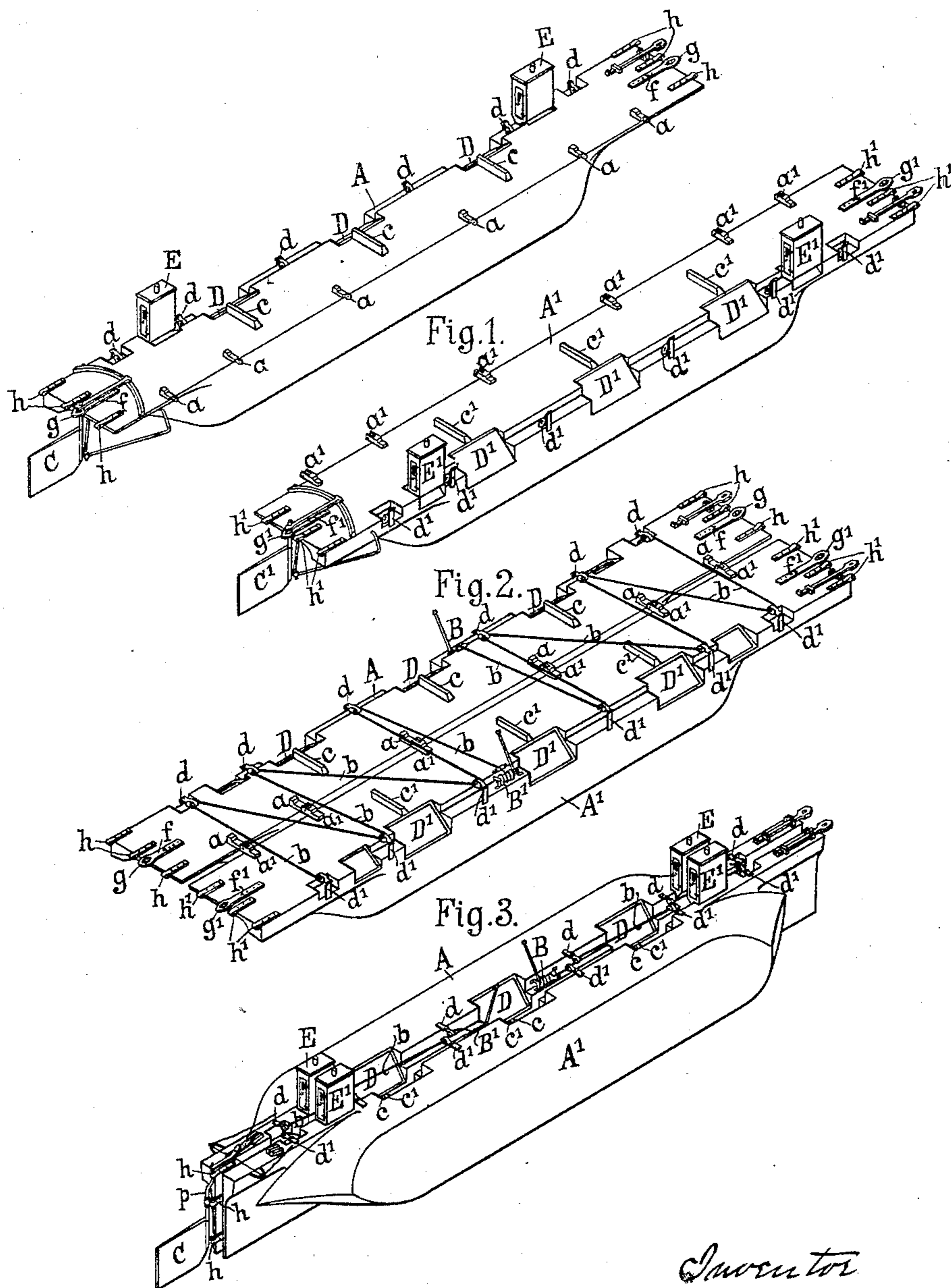
(No Model.)

3 Sheets—Sheet 1

MORITZ RITTER VON SZABEL.
NAVIGABLE VESSEL.

No. 435,107.

Patented Aug. 26, 1890.



Witnesses.
Livingston Emsw
John W. Spencer.

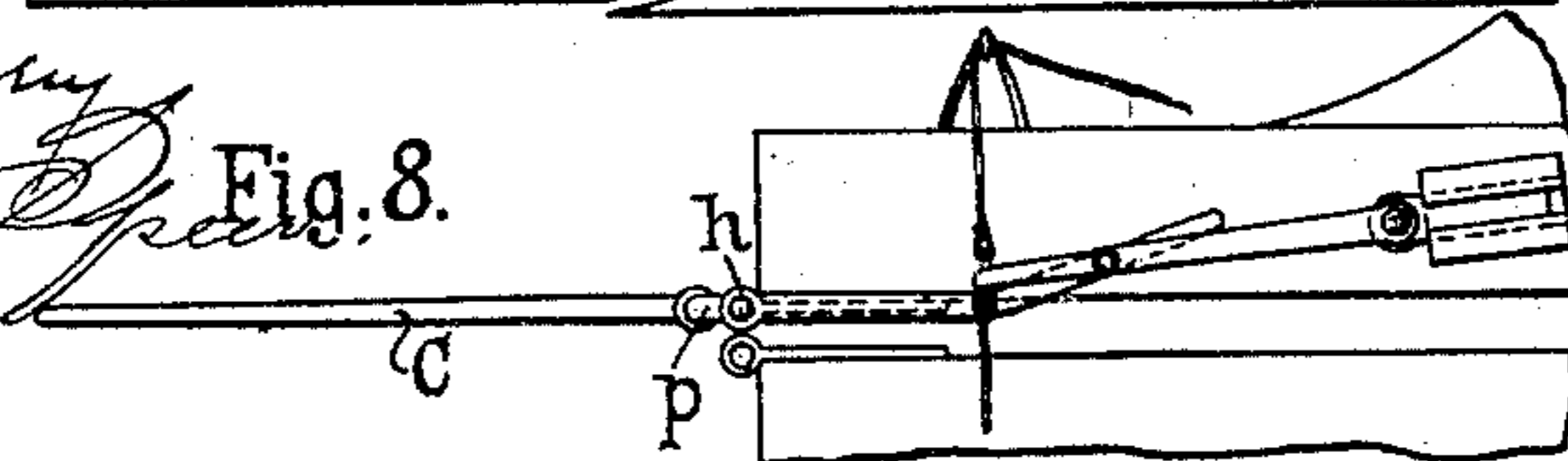
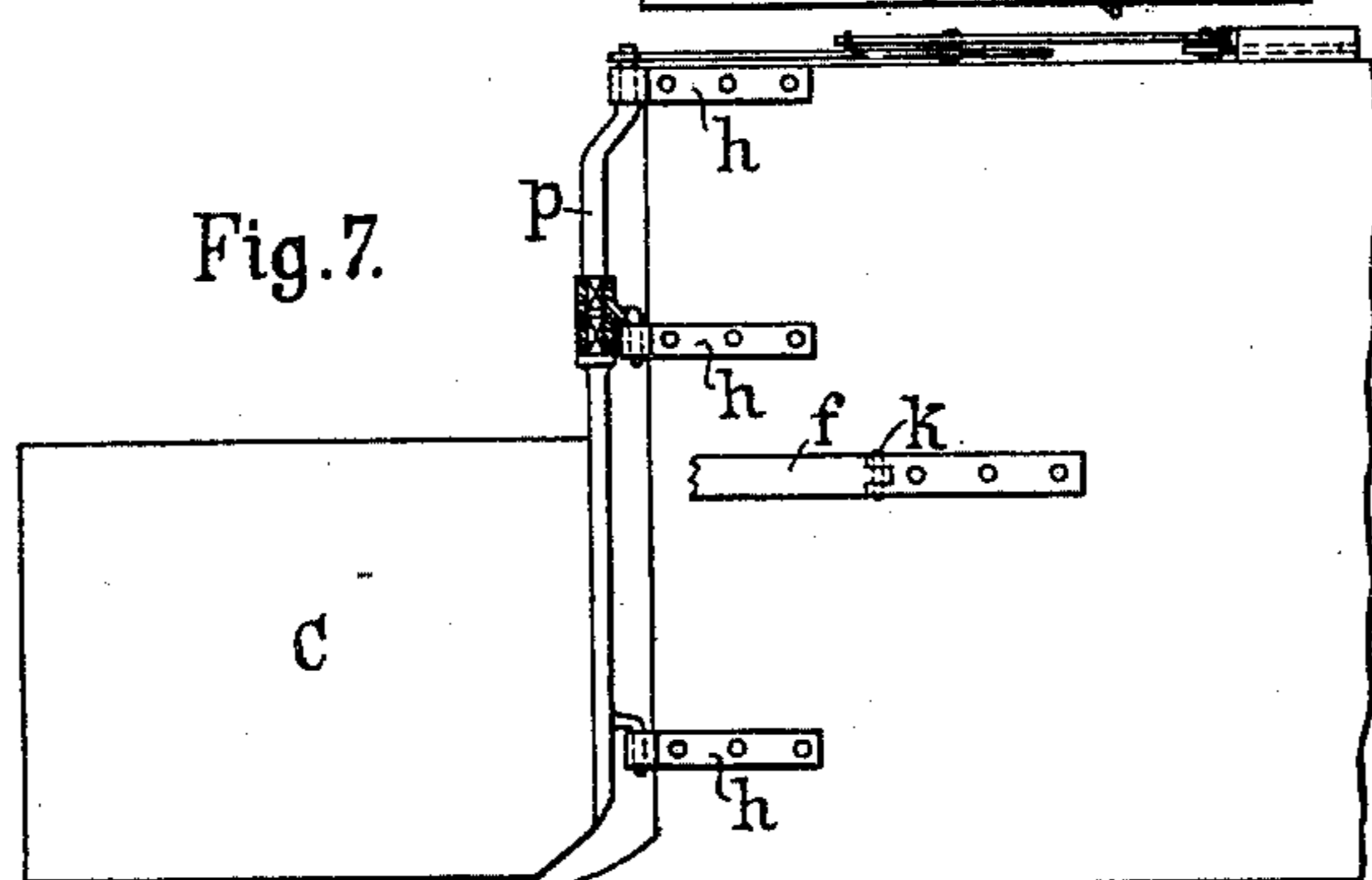
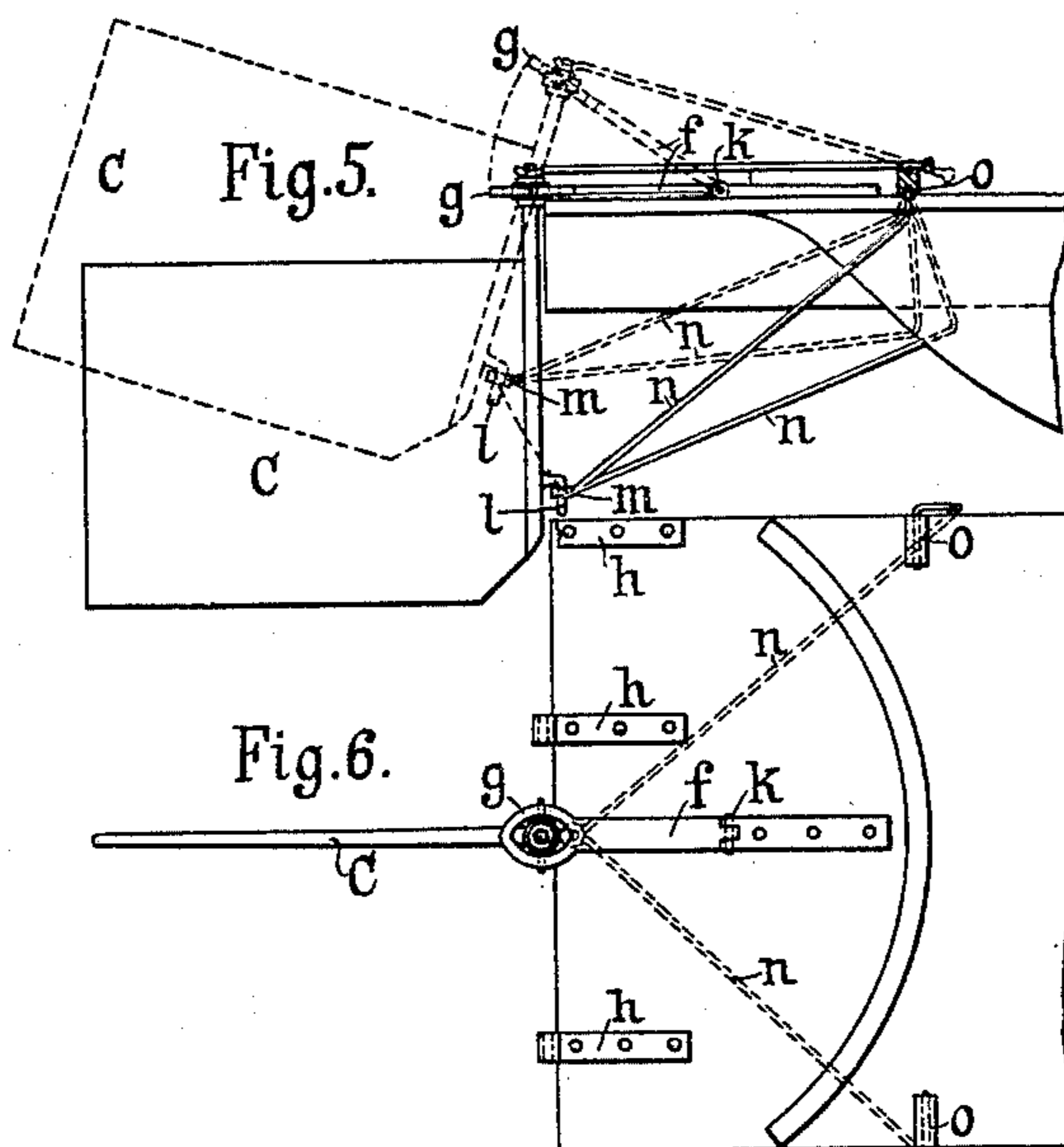
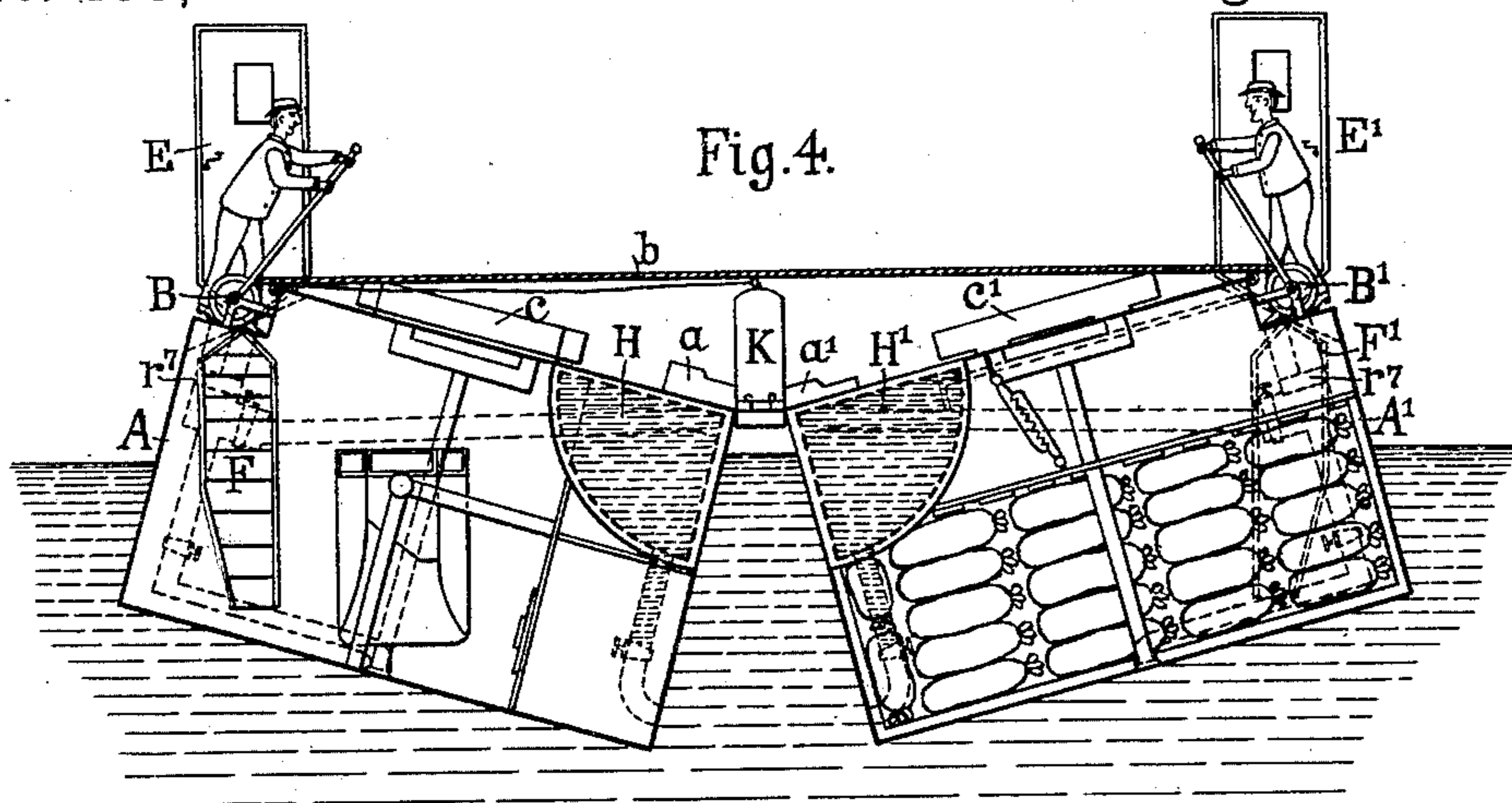
Inventor
Moritz R. von Szabel
by his attorneys
Brieser, Steele & Knautz

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John W. Spear

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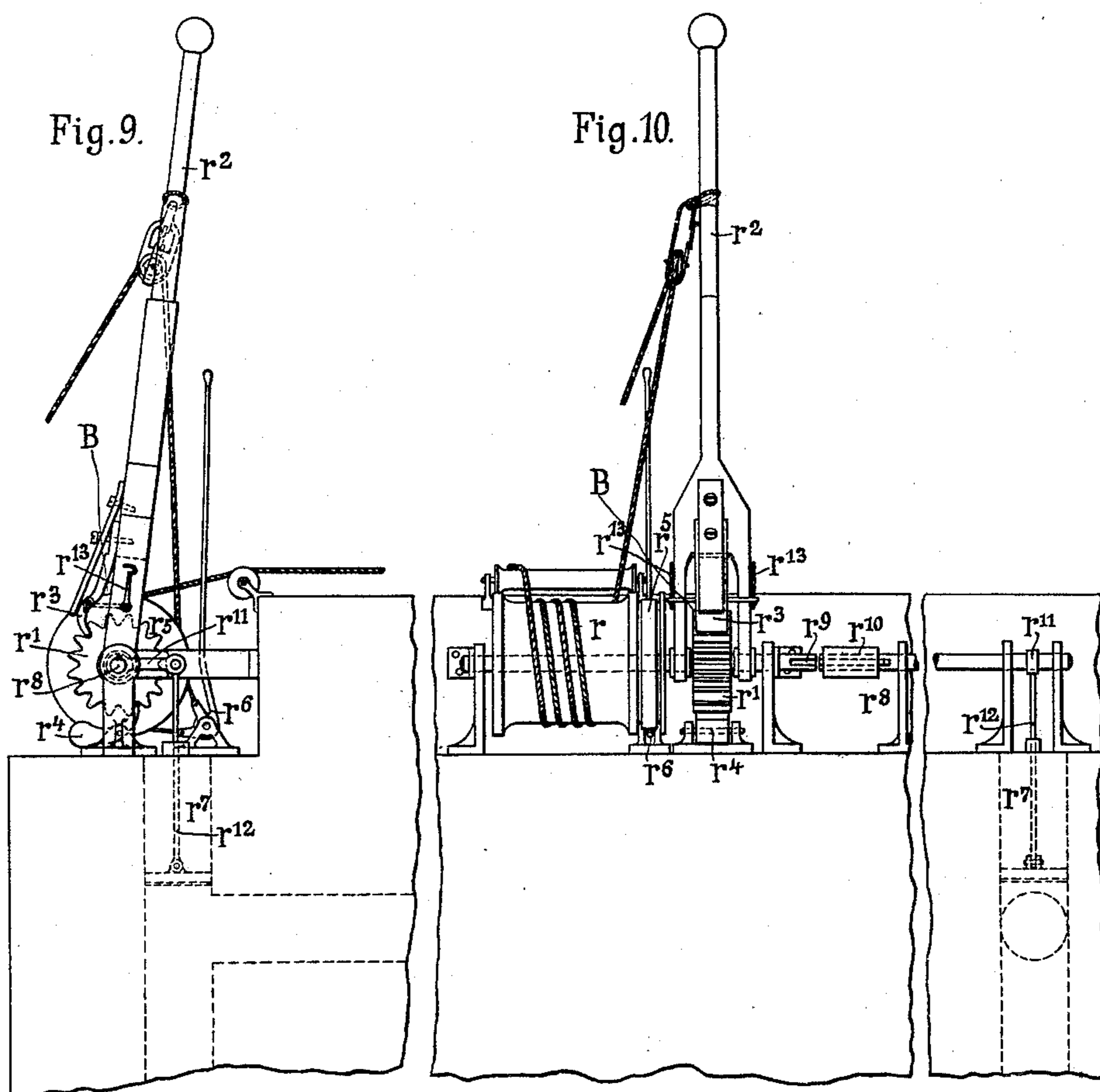
3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

MORITZ RITTER VON SZABEL, OF VIENNA, AUSTRIA-HUNGARY.

NAVIGABLE VESSEL.

SPECIFICATION forming part of Letters Patent No. 435,107, dated August 26, 1890.

Application filed March 16, 1889. Serial No. 303,588. (No model.)

To all whom it may concern:

Be it known that I, MORITZ RITTER VON SZABEL, a resident of Vienna, Empire of Austria-Hungary, have invented certain new and useful Improvements in Navigable Vessels for Rivers, Canals, Lakes, Coasting-Navigation, &c., of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

The object of the present invention is the construction of navigable vessels which may be used as transport, freight, or goods vessels for rivers, canals, lakes, and coasting purposes, with little draft, and two of which vessels in a loaded or unloaded state can be converted into or combined to form one vessel, with more draft, if the depth of the water allows it. On the other hand, two such vessels, if combined into one vessel in a loaded or unloaded state, may be separated again and each float separately as a distinct vessel, if the small depth of the river, canal, &c., requires such separation.

The invention thus consists in two vessels, which may be called "half-vessels," and which can be combined into one complete vessel, or inversely in one complete vessel which can be separated into two half-vessels that can float independently. The two half-vessels are constructed each with decks of corresponding or equal area and of rectangular form, and each half-vessel has one side forming a vertical plane, so that the two half-vessels can be brought together with these vertical sides adjacent. These adjacent vertical sides of the two half-vessels may be coupled together by suitable hinges, these hinges forming the pivot on which the two half-vessels, by means of hauling devices attached to the two outer sides, may be turned or swung toward each other and each to the extent of ninety degrees, so that the decks which were previously horizontal will be vertical and face each other. In this position the two half-vessels form a complete vessel. The forms or configurations of the hulls of the half-vessels are such that after combining them in the manner described into one complete vessel they will form the water-lines and the submerging forms of the hull of the complete vessel. The forms of the ends of the half-ves-

sels, as also the forms of the ends of the complete vessel, will allow of such vessels being easily towed or propelled in either direction, which is of great advantage in navigating narrow rivers or canals. It is well known that large vessels—that is, the complete vessel—offer greater advantages in carrying freights or goods. On the other hand it is obvious that in navigating rivers or canals where the depth of water is irregular, or in navigating a main river and its subsidiary rivers and canals it will be of great advantage to have the means of reducing the draft of the loaded vessel, by separating the same into two half-vessels without unloading or lightening. For instance, a loaded complete vessel of, say, eight or nine feet draft, may be reduced by separating it into two half-vessels, which will each draw about five feet only. The position of the hatchways in the two half-vessels offers certain advantages for ready or quick loading or unloading.

In the accompanying drawings, I show in Figure 1 a perspective view of the two detached half-vessels A A', each half-vessel floating separately. In Fig. 2 the two half-vessels A A' are shown in perspective view, floating with their vertical sides alongside each other, being connected together at the top of these sides by suitable hinges *a a'*, and also connected by the ropes *b* at their opposite sides ready for being each turned at an angle of ninety degrees, so as to combine the two half-vessels into one vessel, which is shown in Fig. 3. In Fig. 4 I show the two half-vessels A A' in the act of being combined into one vessel, as in Fig. 3. Figs. 5 to 8 show details of the rudder arrangements, which are more fully hereinafter explained.

The combining or joining of the two half-vessels into one is effected by two or more windlasses or capstans B B'. (Indicated in Fig. 4 and more fully shown in Figs. 9 and 10.) These windlasses or capstans are placed at the opposite sides of the half-vessels to those at which the latter are hinged together.

Referring again to Figs. 1 to 3, *a* and *a'* are the parts near the edges of the decks of the half-vessels by which these two vessels can be hinged together, the sides of the vessels from these edges down to the water-line

being vertical, or nearly so, so that the two half-vessels A A' can be floated or brought alongside each other, as in Fig. 2. The parts *a a'* may consist of gudgeons or eyes and bolts or of bolts and hooks, so as to couple the vessels together and to form in the line of these hinges the pivot for turning the half-vessels.

c c' are suitable fillets or pieces of wood fixed to the decks of the half-vessels, and so arranged that if the half-vessels are combined into one the vessels are unable to separate lengthwise, the one piece *c* coming next to the other piece *c'*, preventing the one vessel moving forward or backward without the other.

On the outer sides of each half-vessel a series of rope-blocks *d d'* are arranged for receiving a rope or several ropes *b*, fixed at suitable places and terminating in the windlasses or capstans B B'.

Each half-vessel is provided at each end with a suitable bolt or bar *f* with an eye *g* for receiving the rudder C. At each end of the said vessels eyes *h h'* are arranged, standing at right angles to the eye *g*, to take the rudder pintle or pins fitted to the rudder when the two half-vessels are combined into one complete vessel. Each half-vessel is further provided at its outer edge with hatchways D D', arranged in a slanting position or at an angle to the deck, and so as to be partly in the deck and partly in the side of each vessel. This position of the hatchways materially increases the facility of loading and unloading the half-vessel separately, and also renders facilities for loading and unloading the vessels when combined into one. The position of these hatchways when combined is clearly seen in Fig. 3. The hatchways are provided with frames for receiving suitable covers.

There are small cabins E E' for the crew, arranged on the deck of the half-vessels. These cabins are pivoted to the deck and counterbalanced by stairs F F', Fig. 4, so that in every position of the half-vessels, whether separated or combined, the cabins and the stairs stand upright.

Each half-vessel is provided at the inner edge formed by the deck and by the vertical side with one or more tanks or reservoirs H H', which may be of any suitable shape and which may be filled with water in order to shift or displace the point of gravity of each half-vessel toward the lines of the hinges or pivot when the turning of the half-vessels is taking place for the purpose of combining them. If these tanks are in the lowest position, they may be emptied by pumping.

The combining of the two vessels into one by turning the vessels coupled by the hinges at ninety degrees is illustrated in Fig. 2, in which the loaded vessels are prepared for said action, Fig. 4 showing the windlasses or capstans B B' at work, and Fig. 3 showing the combination of the two vessels into one com-

plete. For this purpose the rudders C C' are first removed from each vessel, and one of such rudders is subsequently attached to the combined vessel.

As the half-vessels when detached are intended to float in shallow water or in water of varying depth, I have shown in side view and plan in Figs. 5 and 6 the mode of attaching the rudder so that it can yield to any obstruction in the water or on the bottom of the canal or river. For this purpose the bolt or bar *f* with its eye *g* is hinged at *k*, and the pintle or pin *l* of the rudder takes into the gudgeon or eye *m*, formed by two rods *n n*, which are free to swing at *o o*. In this manner any obstruction met with by the rudder will cause the latter to yield and to rise automatically and sufficiently to avoid injury. Such arrangement is not necessary for the rudder of the complete vessels, as this is intended to float in deeper water. However, in this case the stem or pintle of the rudder will be too short, and I therefore arrange it at top to be coupled with a prolongation *p*, Fig. 7, which allows the tiller to come over the deck and to be worked in any suitable manner.

I give more detailed views of the windlasses B B' in Figs. 9 and 10. The windlass is composed of a drum or cylinder *r*, a ratchet-wheel *r'* on the shaft of said drum, a lever *r²*, with a pawl *r³* to work the drum by means of the ratchet-wheel *r'*, and a pawl *r⁴* for keeping the drum in position on the return-stroke of lever *r²*. On one side of the drum a fixed pulley *r⁵* is arranged, surrounded by a steel band fixed at its two ends to the short end of an angle-lever *r⁶*, by which a brake action may be caused against any undue tendency of the drum *r* to return. The windlass is combined with a pump *r⁷*, which can be worked by the lever *r²*. For this purpose the end *r⁹* of the shaft of the drum faces the end of a rocking shaft *r⁸*. The shaft *r⁹* and the shaft *r⁸* can be coupled by the sleeve *r¹⁰*. From the rocking shaft *r⁸* an arm *r¹¹* projects, which is connected to the piston-rod *r¹²* of the pump *r⁷*. For using the pump the pawl *r⁴* is turned so as to be out of the way of the ratchet-wheel, and the pawl *r³* is united to the lever *r²* by a hook *r¹³*. On now imparting a rocking motion to lever *r²* the ratchet-wheel and the shaft will not rotate, but rock only, thereby causing the pump-piston to make the necessary up and down motion.

The pump can be used to empty the tanks H H' while in the lowest position, or to pump oil or any other liquid, if such liquid forms the freight of the vessels, into casks or tanks, or to pump water out of the ship, if necessary.

In the half-vessels, two of which can be transformed into one complete vessel, as described, the freight must of course be safely stowed, so as to avoid any movement in such freight in the action of turning the vessels to the extent of ninety degrees.

In applying the windlasses B B' for turning the two half-vessels, a block K, Fig. 4, of

suitable shape and suspended in any suitable manner, can be placed between the edges of the two vessels to receive the pressure of the two latter and to prevent any inequality of declination of the two vessels during the action of turning.

Having now described my invention, what I claim is—

The two vessels A A', capable of floating independently, having two corresponding vertical sides adapted to come together, the decks of said vessels being of substantially equal area, in combination with hinges on the upper part of the vessels at the meeting

sides, whereby the two semi-vessels may be hinged together at the upper part of their vertical sides, and with means, substantially as described, for turning said semi-vessels on their hinges to bring the two vessels to form a double or full vessel, substantially as herein shown and described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

MORITZ RITTER VON SZABEL.

Witnesses:

EDMUND JUSSEN,
OTTO SCHIFFEN.