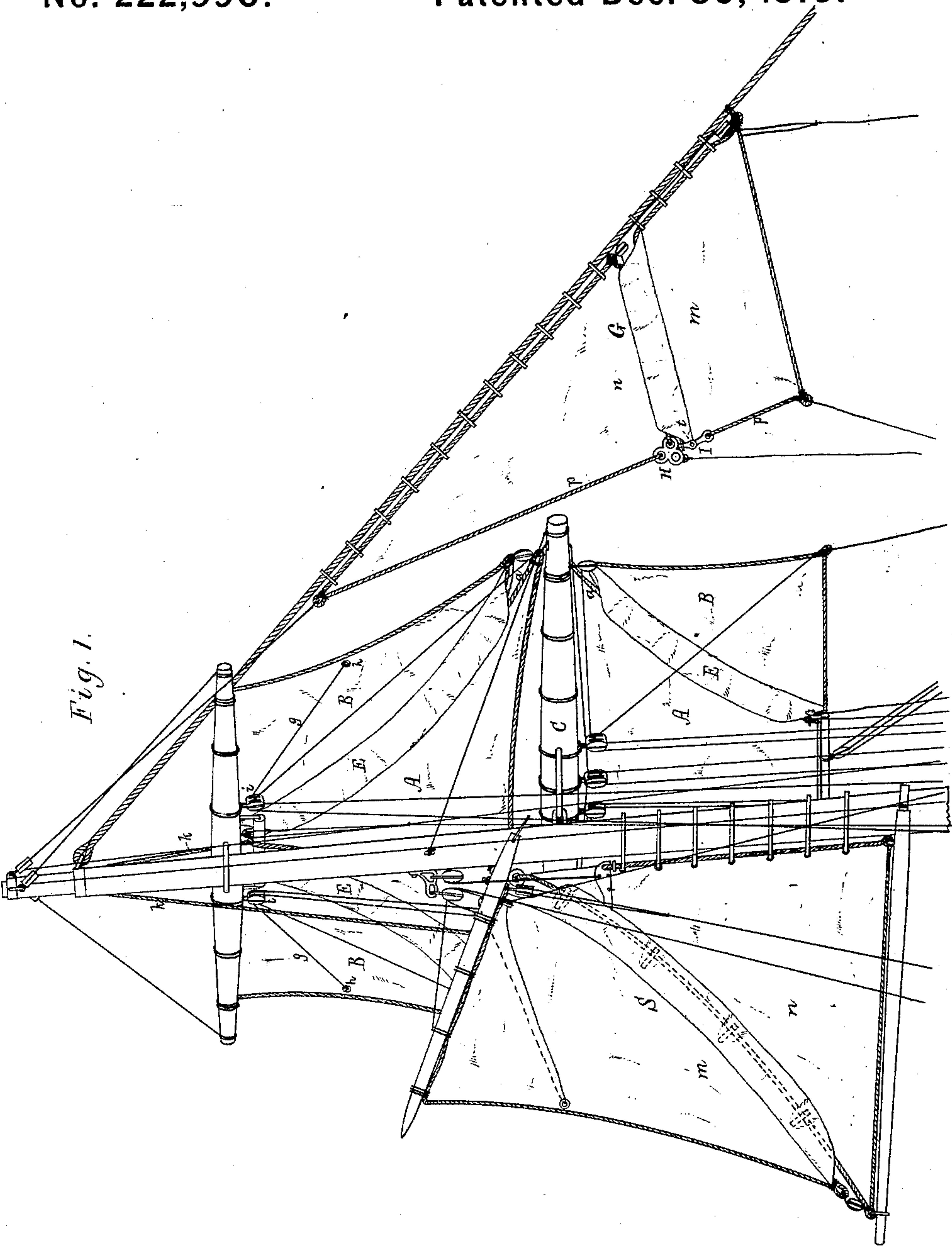


H. FLOWERS.  
Reefing and Furling Sails.

No. 222,990.

Patented Dec. 30, 1879.



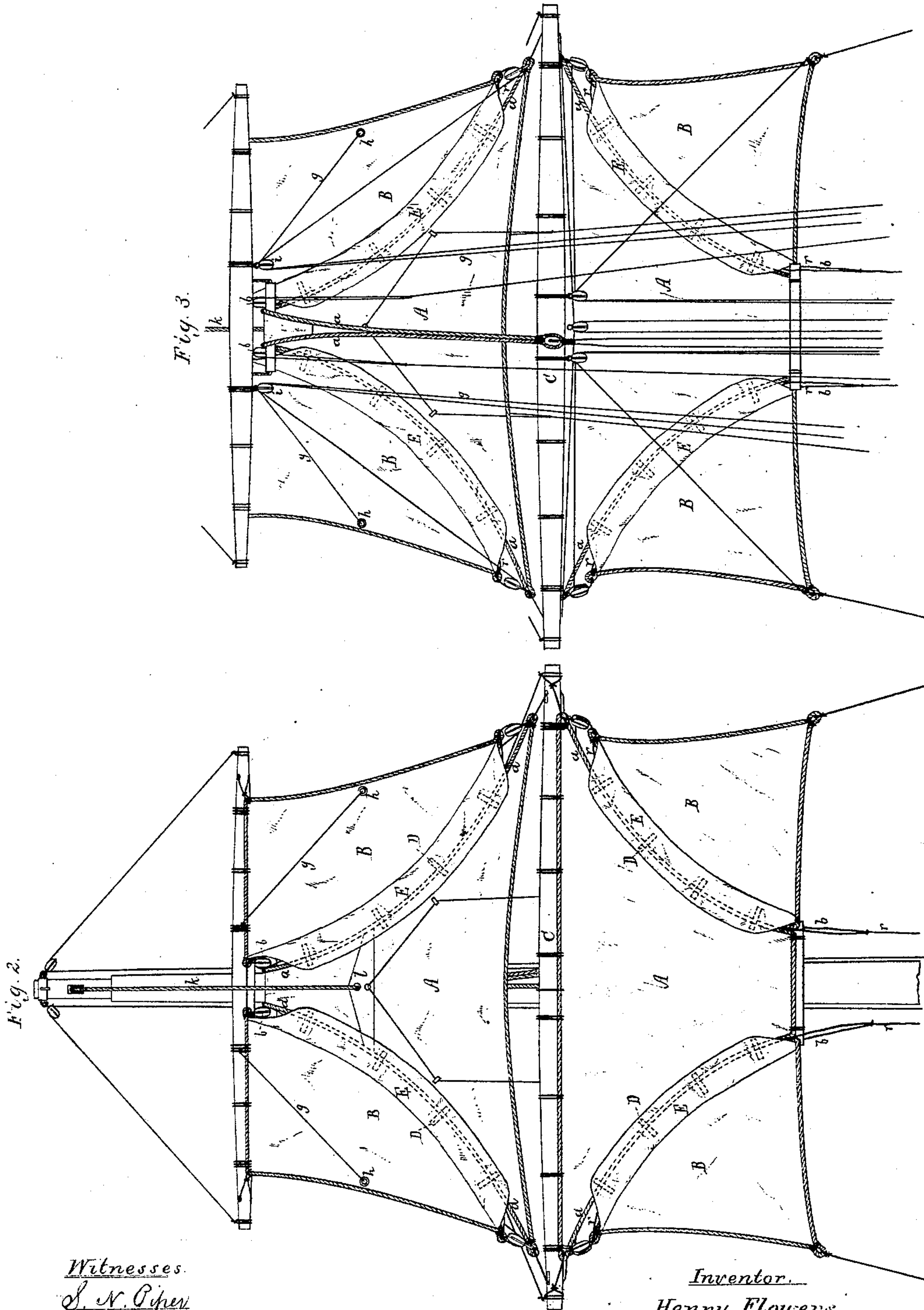
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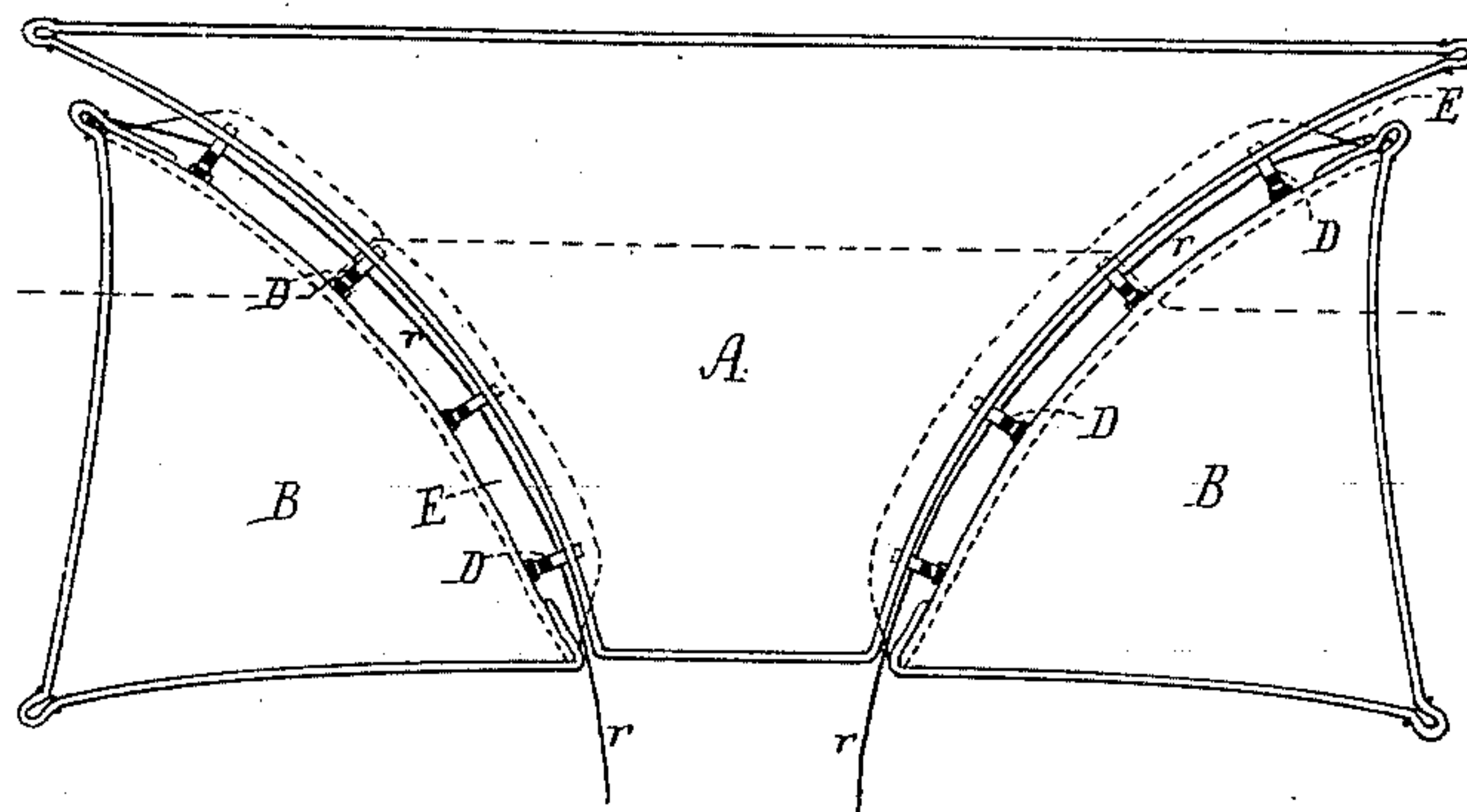


Fig. 5.

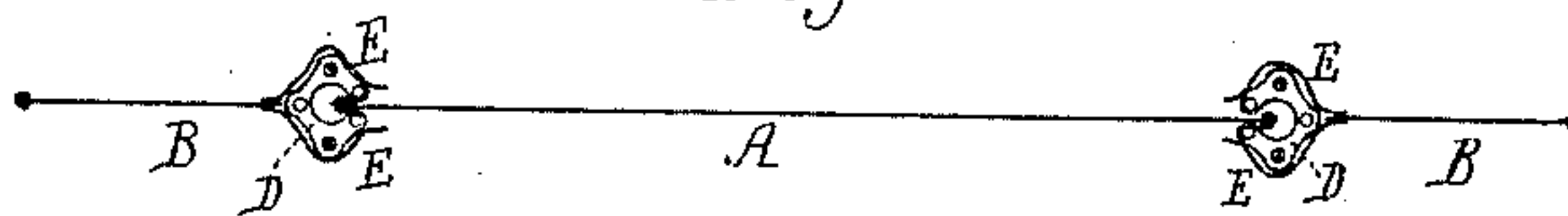


Fig. 8.

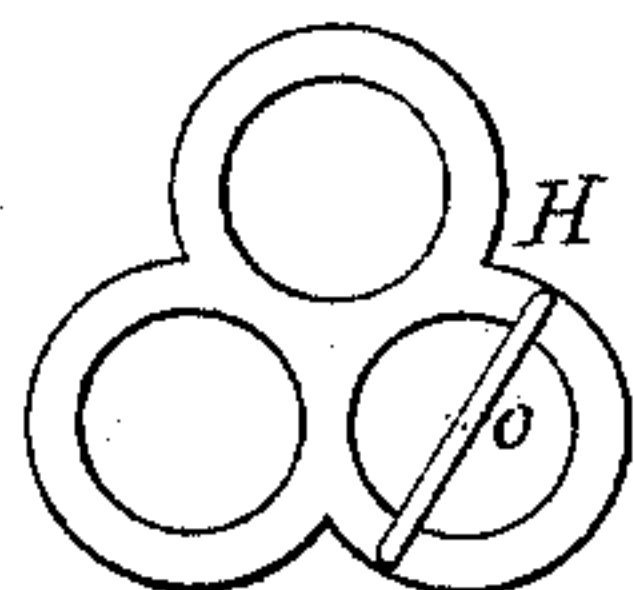


Fig. 9.

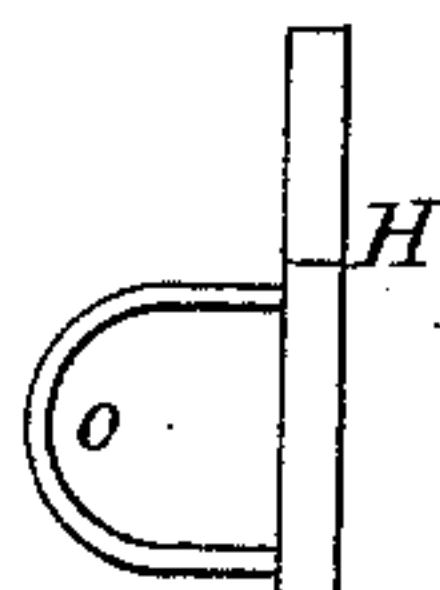


Fig. 7.

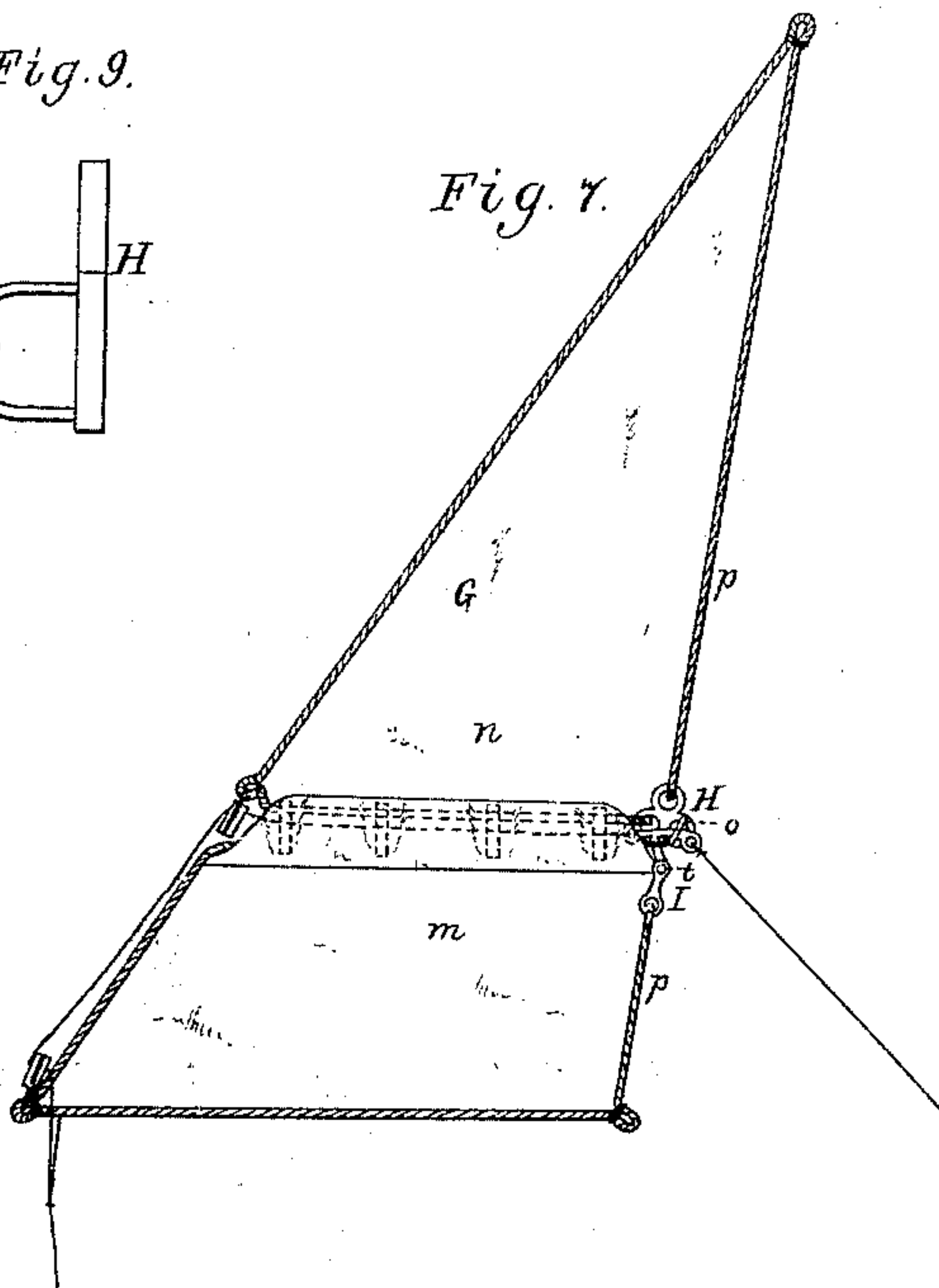
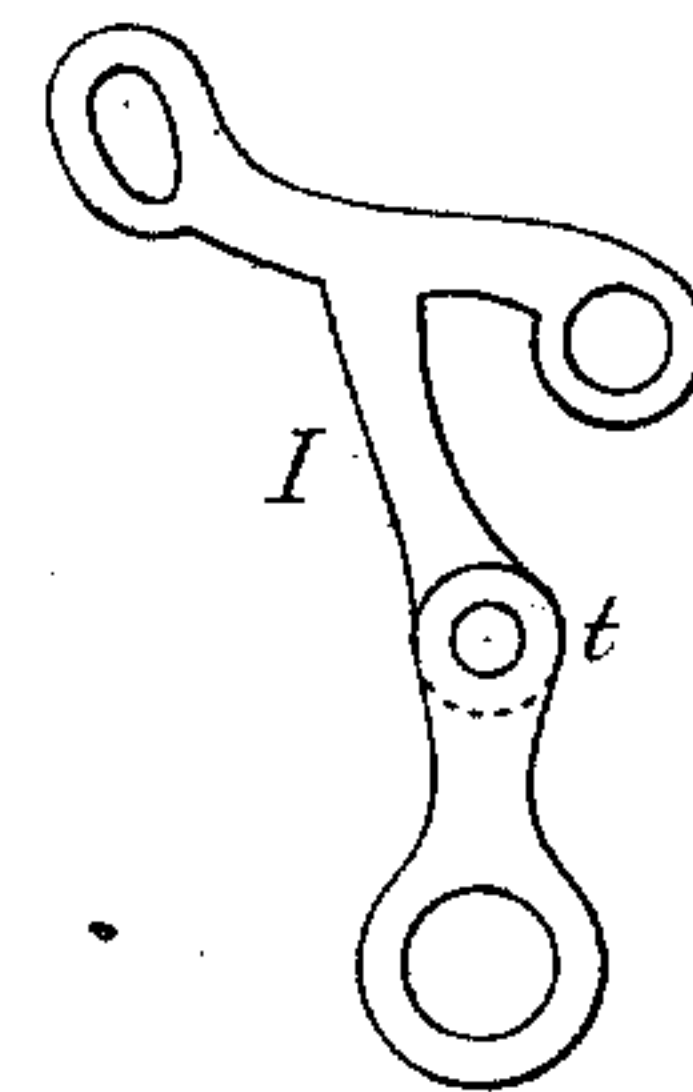


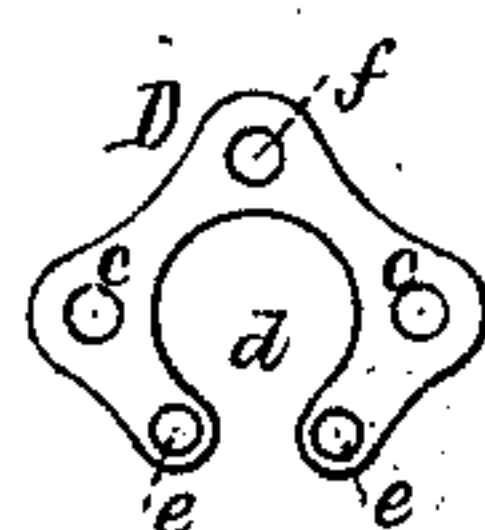
Fig. 10.



Witnesses.

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Fig. 6.



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# UNITED STATES PATENT OFFICE.

HENRY FLOWERS, OF HALIFAX, NOVA SCOTIA, CANADA.

## IMPROVEMENT IN REEFING AND FURLING SAILS.

Specification forming part of Letters Patent No. **222,990**, dated December 30, 1879; application filed October 27, 1879.

*To all whom it may concern:*

Be it known that I, HENRY FLOWERS, of the city and county of Halifax, in the Province of Nova Scotia and Dominion of Canada, have invented a new and useful Improvement in Reefing and Furling Sails of Vessels, such being to enable them to be reefed to advantage; and I do hereby declare the same to be described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a side view of a mast and its appurtenances, showing sails thereto as provided with my invention. Fig. 2 is a front elevation, and Fig. 3 a rear elevation of fore and top sail yards, such figures showing the foresail and top-sail as provided with my invention. Fig. 4 is a vertical section, and Fig. 5 a horizontal section, of the foresail. Fig. 6 is a side view of one of the bonnet-guides. Fig. 7 is a side view of a jib with its adjuncts, such jib having its two sections connected as are those of the foresail and foretop-sail.

The nature of my invention is duly set forth in the claims hereinafter made.

The invention is specially applicable to the yard-sails of a ship—that is to say, to a sail supported by one of the yards, as a foresail or foretop-sail, or foretop-gallant sail, for instance. In the making of either of such sails, I compose it of three triangular or approximately triangular sections, A B B, one of which, A, is arranged between or flanked by the others, or bonnets, B B, as represented. The middle one, or main section, is to be connected at its base angles, or more or less along its base, to the yard—as, for instance, to the foreyard C. The drawings show the middle sections of the foresail and foretop-sail as so applied to the foreyard. They also represent the reefing or flanking sections B B of the top-sail as so applied to the top-sail yard, the sections of the top-sail being inverted relatively to those of the foresail.

At the two opposite edges of the middle section such section has stout leech-ropes *a a* applied and fixed to it, such edges, by preference, being curved as shown. Each of such leech-ropes is embraced, as represented, by a set of metallic guides, D, that slide freely on it, these guides being arranged at, or about

at, equal distances apart, and connected at their middles to the next adjacent part or edge of the reefing bonnet or section B. To the said section, and to the several guides of the set, two strips of canvas, or flies, E, are fixed, and arranged as represented, such flies serving not only to aid in supporting the guides, but to so cover any opening between the middle section and the reefing-bonnet as to prevent wind from passing between them when the sail may be full or taking wind.

Each bonnet is to have applied to it suitable reefing and setting tackle. The setting-tackle is to be fixed to the section at or near its vertex; but the reefing-tackle (shown at *b*) goes through holes *c c* in both prongs of each of the bonnet-guides. Each guide, besides its central opening, *d*, has five holes, *c c e e f*, arranged in it in a manner as shown in Fig. 6.

The reefing-tackle consists of a rope, *r*, which, after having been run down through the several guides of the bonnet, is turned, and is run up through such guides, such being so as to cause the guides on the rope being pulled to be drawn together and up to the yard in a manner to reef the bonnet. The setting and reefing lines are to be carried through suitable blocks or guides, and down to or near the deck, or to belaying-pins suitably arranged thereabout.

Furthermore, in case of a top-sail, one or more additional reefing-lines may be applied to it near its leech or outer edge, such being as shown at *g*. The line or rope *g*, fastened at its upper end to the top-sail yard, runs through an eye, *h*, in the sail, and thence up through a block, *i*, fixed to the yard; thence the rope goes down to or near the deck, and is there to be belayed, as occasion may require.

The middle section of the sail should have applied to it suitable devices for setting the section and taking it in; in other words, in case of a top-sail, it is to have a setting-halyard, *k*, at its peak, and also one or more proper down-hauls, all of which may be extended from a metallic head piece, *l*, of proper kind, fixed to the said section near its peak or head.

The drawings show a stay-sail or jib, G, and a spencer or spanker, S, such being made



in two sections, *m n*, formed and arranged as shown. The two sections of each of such sails are to be connected in the same manner as are the bonnet and middle section of the top-sail hereinbefore described, the reefing-bonnet *m*, which, in case of the spencer or spanker, is the upper section, and in case of the jib is the lower one, having fixed to it and the set of slides two flies, as hereinbefore explained as used in the foresail or in the top-sail.

The main section of the jib has fixed to it, at its after lower corner, a three-eyed connection-piece, *H*, of metal, formed or exhibited in side view in Fig. 8 and edge view in Fig. 9. Such connection-piece is furnished with a yoke, *o*, projecting down from it, as shown, into which a double bill-jointed hook, *I*, formed as represented in side view in Fig. 10, and attached to the bonnet, takes, as shown, when the bonnet is set. The shank of the said hook is in two parts, hinged together, as shown at *t*, whereby the shank can fold or stow to advantage. The piece *H* and hook *I* serve to relieve the connections of the two sections of the sail of much strain when the sail is filled. The reefing-line of the bonnet goes through the eye of the upper prong of the hook *I*. The said parts *H* and *I* are attached to the leeches *p* of the sections.

The advantages of the described improved yard-sails are, that they do away with the extra weight aloft of double top-sail and top-gallant yards; that they can be reefed and taken in more quickly and with less hands or men than are usually required with common sails. Should the vessel be caught by a sudden squall, the sails can be reefed and taken in without starting the yards. They can be reefed in full when aback or shaking. They can also be utilized for bracing the yards about if the vessel is short-handed, as such

may be done by hauling up a bonnet of the top-sail on the same side on which the braces are to be hauled. The reefing and setting gear should lead down to the deck, if possible, in order that such gear may be readily got at in cases of emergency.

I claim as my invention as follows, viz:

1. A yard-sail, as explained, as composed of the three triangular, or approximately triangular, sections *A B B*, arranged and adapted to each other by means substantially as described, viz., by the leech-rope applied to one section, and by the series of metallic slides applied thereto and to the other section, all being to operate essentially as specified.

2. The combination of the canvas strips or covering-flies *E E* applied to the bonnet, with it and the sail-section next thereto, and the leech-rope and set of metallic slides, applied to the said sections, as set forth.

3. In combination with the two next adjacent sail-sections, connected by means of a leech-rope and a set of slides, as described, the reefing-line, extended in opposite directions, as explained, through each of the slides of the set.

4. The jib or stay-sail sections, connected by means of the leech-rope and the series of slides, and provided with the triple-eyed and yoke-connection piece *H*, and the double bill-jointed hook *I*, arranged and applied to the sections, as set forth.

5. The triple-eyed and yoke connection *H*, and the double bill-jointed hook *I*, constructed and for use, substantially as set forth.

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