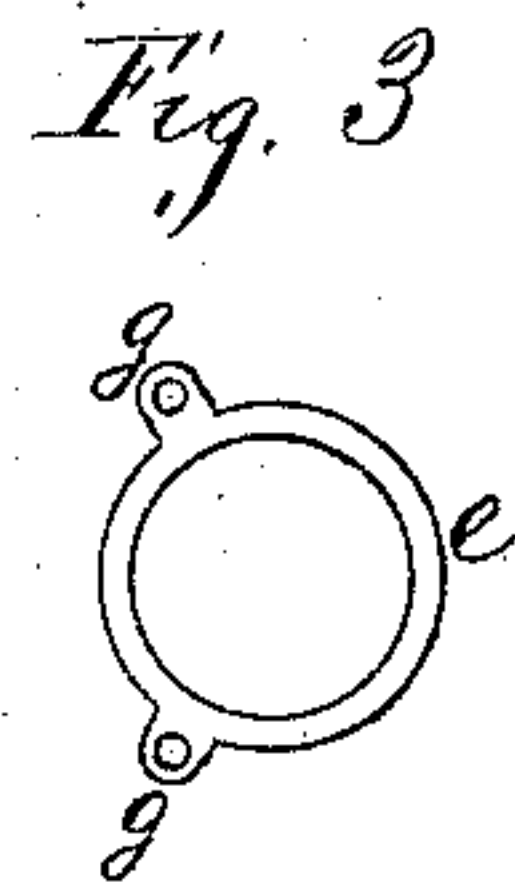
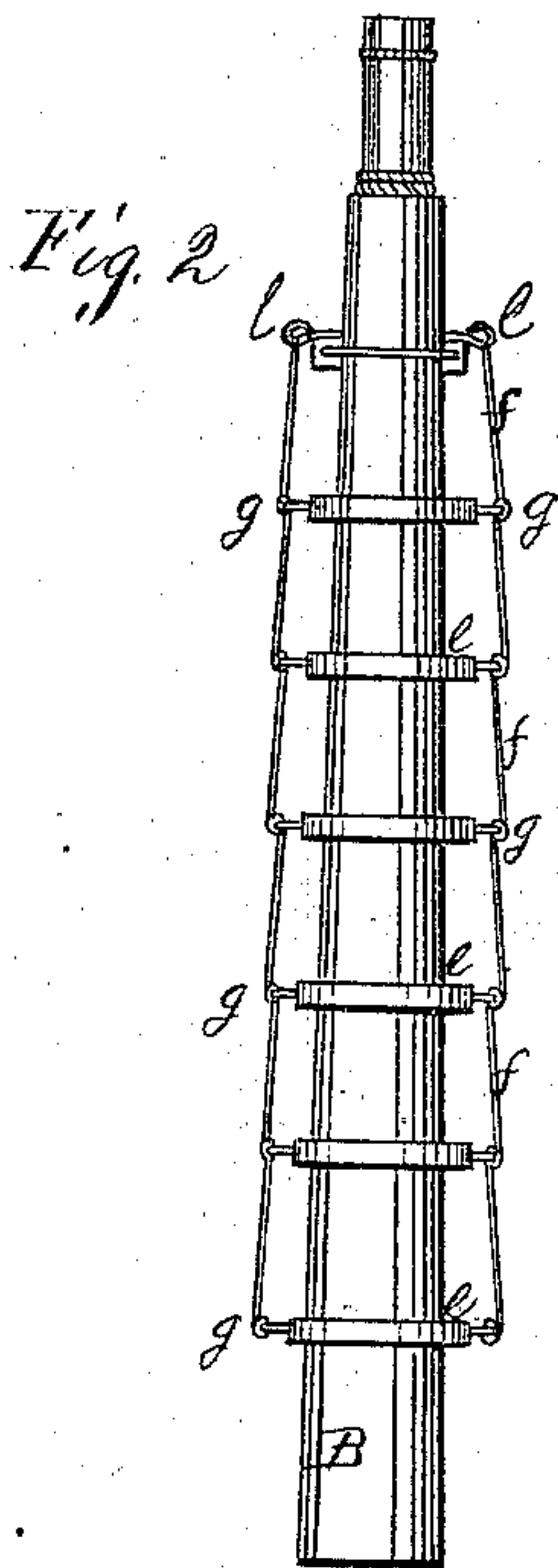
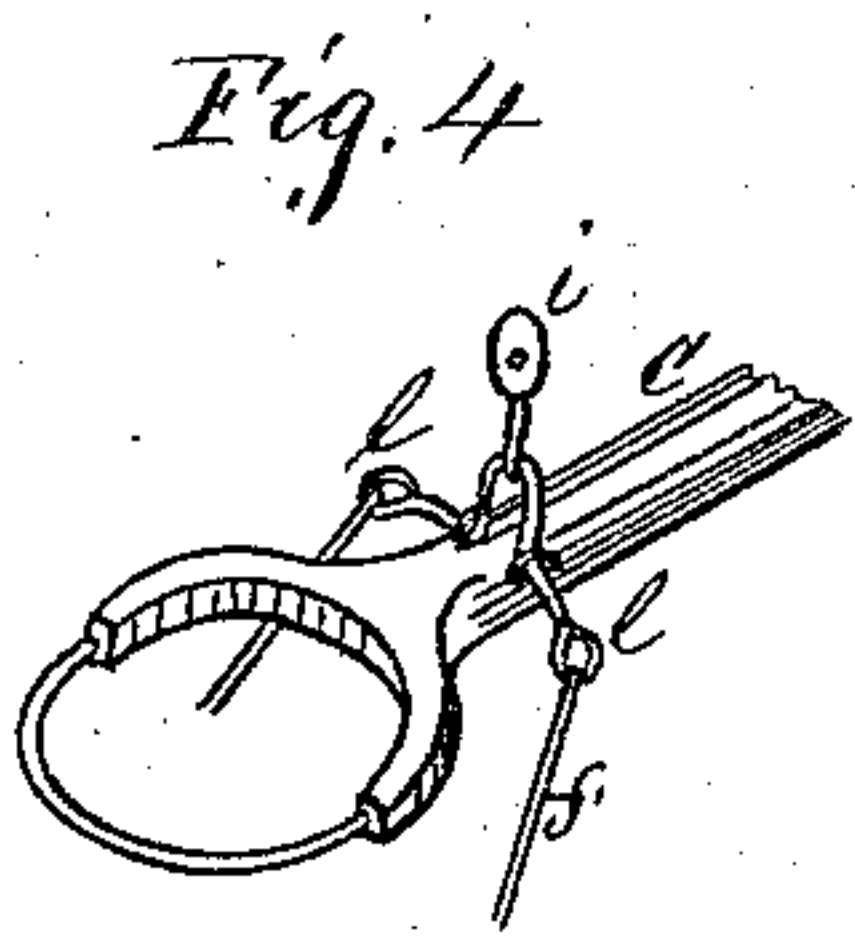
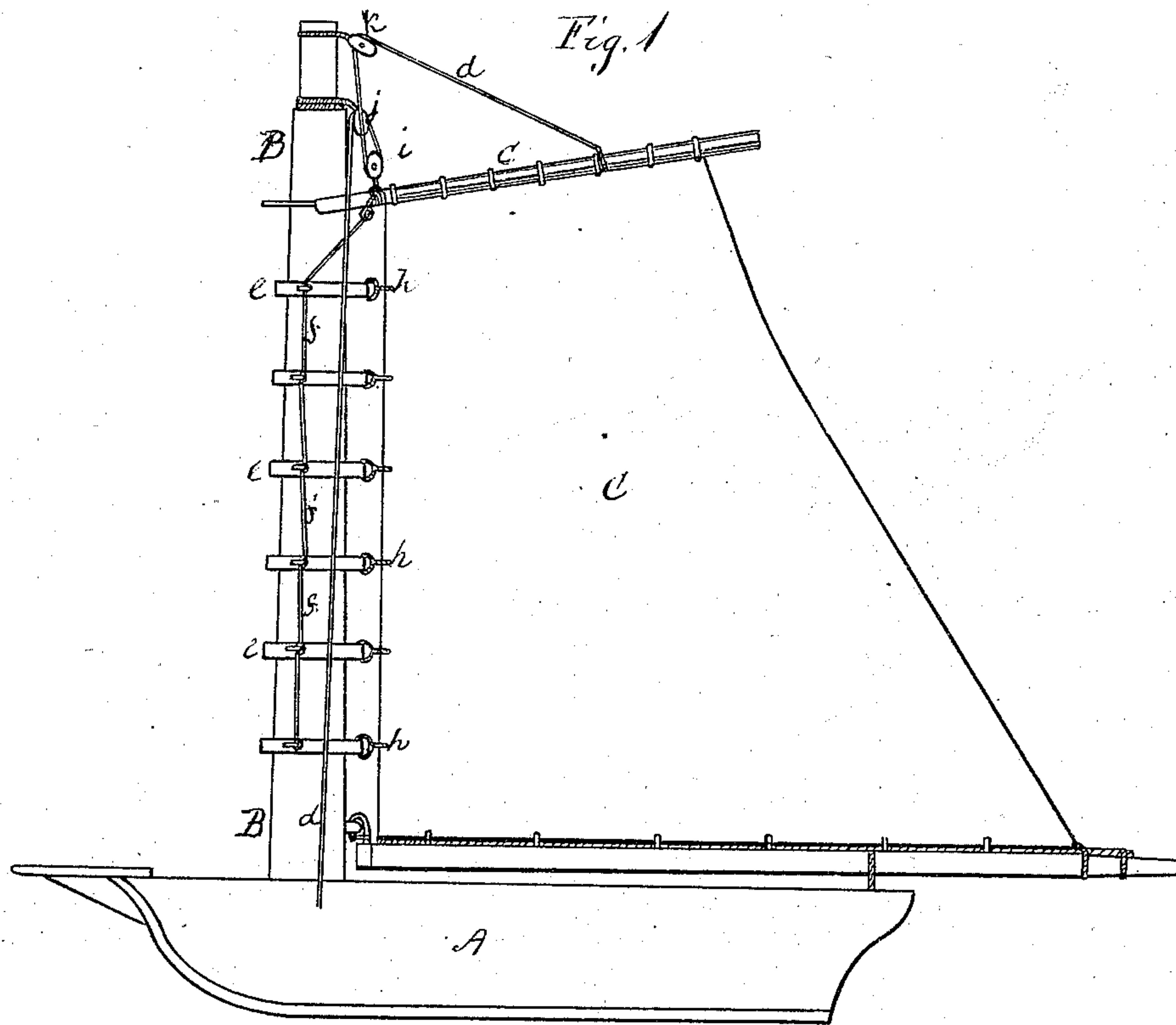


W. F. PATTERSON.
Balance Line for Mast Hoops.

No. 231,928.

Patented Sept. 7, 1880.



Witnesses.
H. Brown
W. H. Reiff.

Inventor.
Wm. F. Patterson
by J. N. Adams
Att'y

UNITED STATES PATENT OFFICE.

WILLIAM F. PATTERSON, OF BOSTON, MASSACHUSETTS.

BALANCE-LINE FOR MAST-HOOPS.

SPECIFICATION forming part of Letters Patent No. 231,928, dated September 7, 1880.

Application filed March 3, 1880. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM F. PATTERSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Balance-Lines for Mast-Hoops, of which the following is a specification.

My invention relates to improvements in hanging the gaff and sail hoops in sailing-vessels.

Heretofore the gaff has been provided with a rope attached near its ends, and having a fixed ring by which it was suspended from a block by a sail-hoisting rope or the peak-halyard. The hoops have been connected by stays, which were, in turn, connected with the gaff. The gaff has also been connected with the mast by a yoke composed of two mast-encircling rings, attached one to the other rigidly by a neck, to which neck the gaff was jointed, and the whole suspended by a link from this joint, the hoops being stayed also.

My improvements consist in a loop swiveled to the gaff just forward of the throat and connected with the throat-halyard, and said loop having laterally-extended arms on either side, to which arms the stays that connect and sustain the said hoops are attached, so that at whatever inclination the gaff may be the stays will remain in the same position relative to the mast—namely, at right angles thereto; hence said hoops, in raising and lowering the sail, will move up and down the mast with the least possible friction, and substantially out of contact therewith.

Referring to the drawings, Figure 1 is an elevation of a vessel with the sail raised and embodying my invention. Fig. 2 is a front view of a mast, showing the connection of the hoops and stays and the attachment to the gaff. Fig. 3 is a plan view of a hoop and its eyebolts. Fig. 4 shows the swivel-connection of the gaff.

A represents the hull of a vessel, B the mast, and C the sail. The hoops *e* are provided each with eyebolts *g*, at equal distances apart and at equal distances from the point of connection with the sail. The hoops *e* are connected together by means of stays *f* attached to each eyebolt.

On the upper part of the gaff, near the mast or just forward of the gaff-throat, is a swivel-connection, consisting of a bar or rod bent to form a loop, as shown in Fig. 4, which loop is connected to the throat-halyard pulley-block *i*, and having arms extending each side and projecting over the gaff. These arms are connected to the gaff by eyebolts, so as to admit of their swinging freely, and are provided at their outer ends with eyes *l l*, to which the upper ends of the stays *f* are attached.

The upper ends of the stays *f* may be attached directly to these eyes, or they may pass through the same and be attached to the pulley-block *i*, through which pass the halyards *d*.

The swivel-bar is attached to the pulley-block *i* and to the gaff in such a manner that at whatever angle the gaff may be in relation to the mast the hoops will always hang parallel with each other and at right angles with the mast, whether in hoisting or lowering the sails.

What I claim is—

The combination of the gaff, the halyard-block *i*, the hoops *e*, the hoop-stays *f*, and a swivel-loop attached to the gaff and provided with stay-supporting arms, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM F. PATTERSON.

Witnesses:

WM. BICKFORD,
W. H. REIFF.