(No Model.)

3 Sheets—Sheet 1.

J. H. SMITH.

PATCH FOR BREACHES IN SHIPS.

No. 438,196. Patented Oct. 14, 1890.

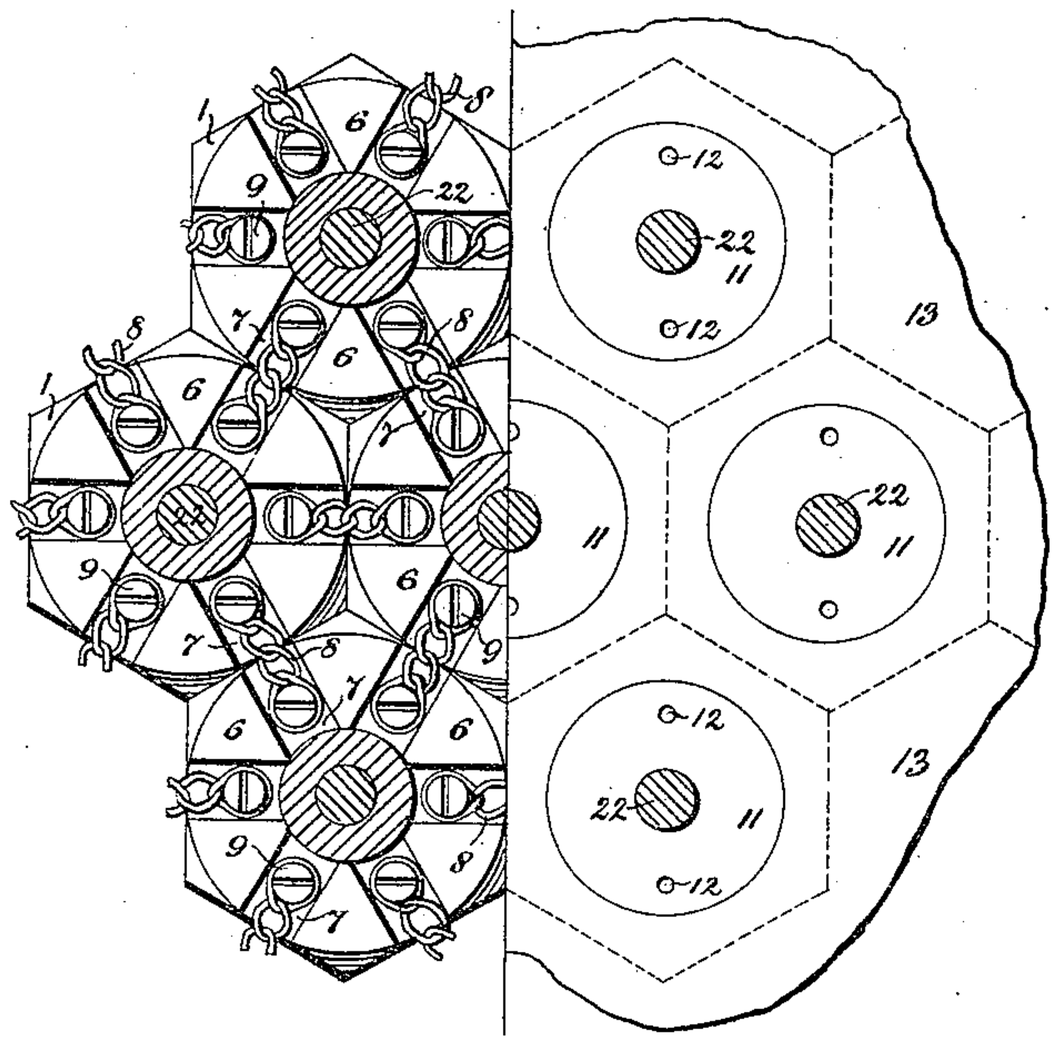

Fig 3.

Fig 2.

Fig 6.

Fig 1.

Fig 7.

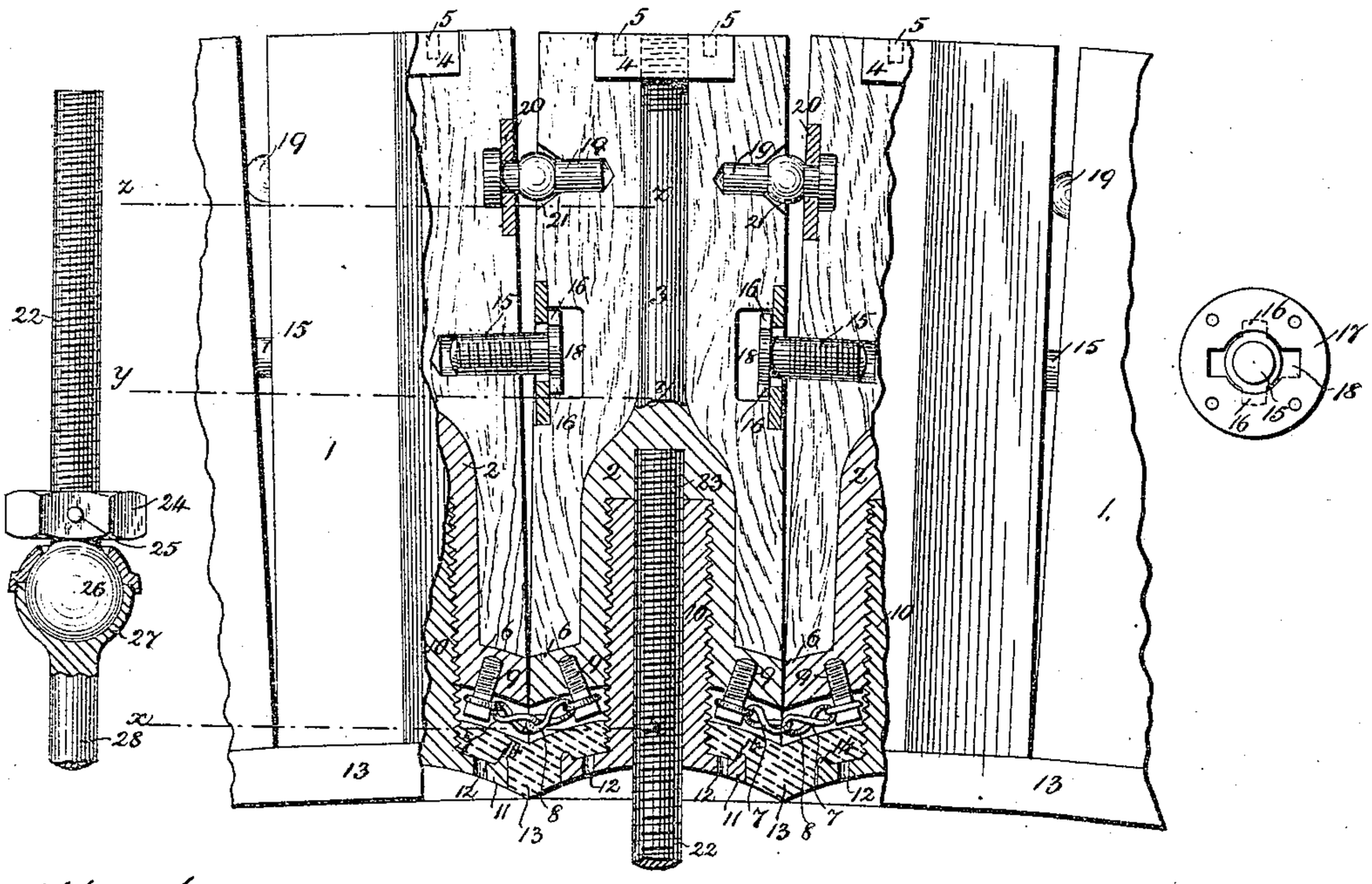

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Fig 4.

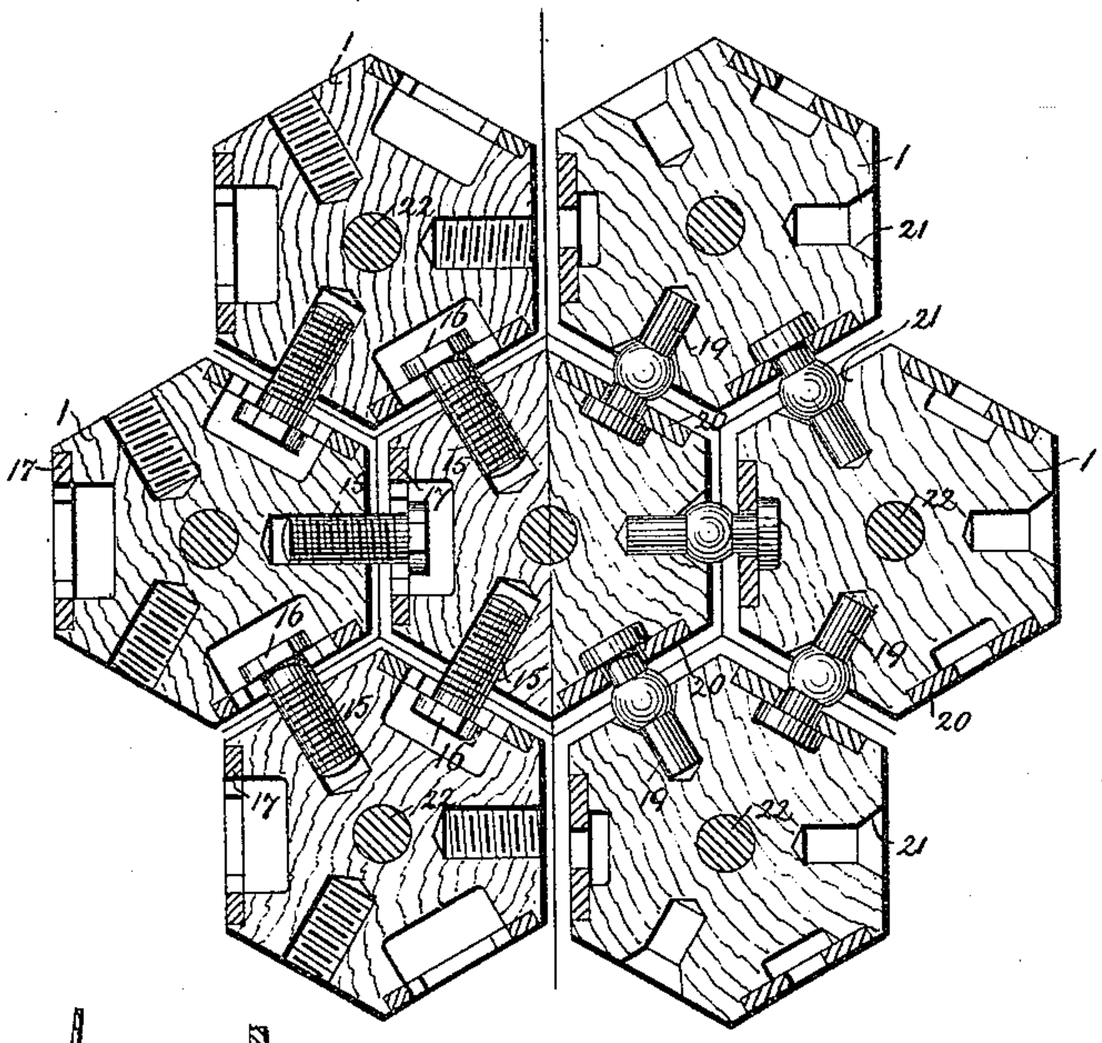

Fig 5.

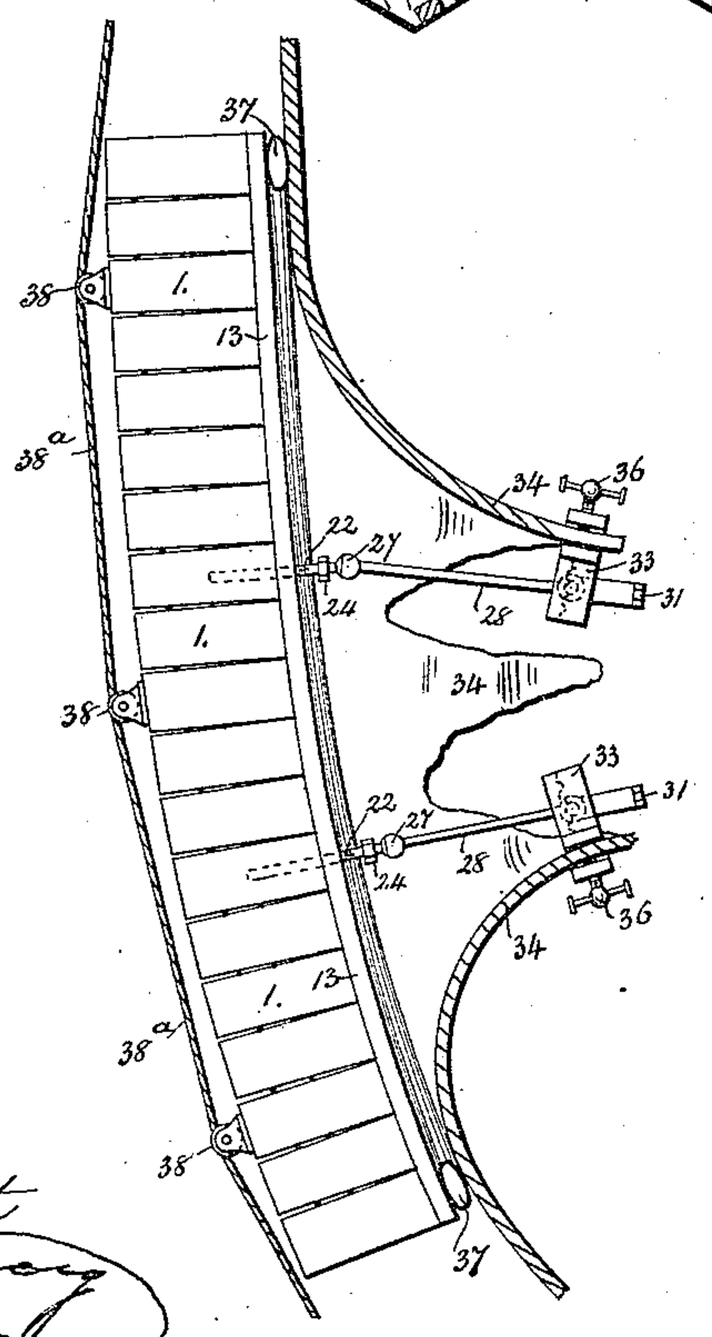

Fig 13.

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(No Model.) 3 Sheets—Sheet 3.

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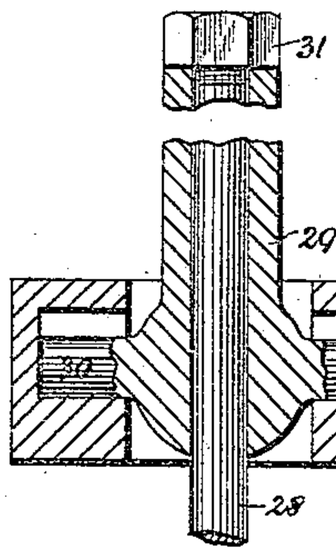

Fig 9.

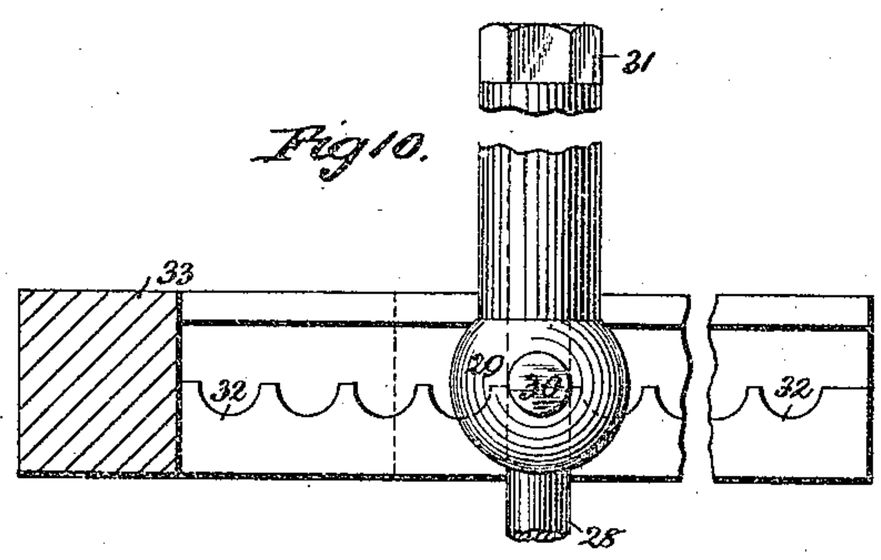

Fig 10.

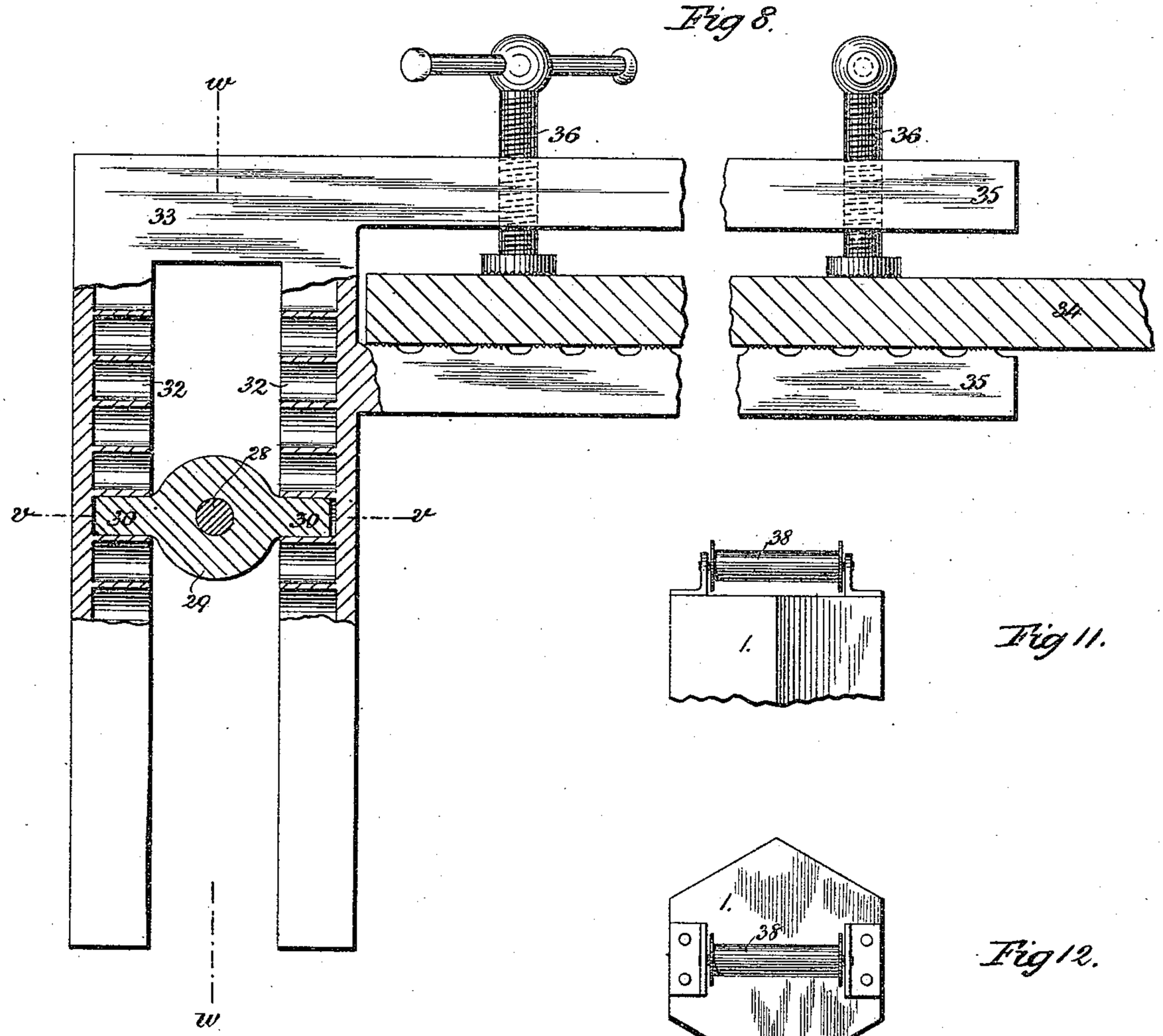

Fig 8.

Fig 11.

Fig 12.

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UNITED STATES PATENT OFFICE.

JOHN HAIGH SMITH, OF SOUTHPORT, ENGLAND.

PATCH FOR BREACHES IN SHIPS.

SPECIFICATION forming part of Letters Patent No. 438,196, dated October 14, 1890.

Application filed February 9, 1889. Serial No. 299,340. (No model.) Patented in England September 21, 1886, No. 11,964.

To all whom it may concern:

Be it known that I, JOHN HAIGH SMITH, a subject of the Queen of Great Britain and a resident of 144 Portland Street, Southport, in the county of Lancaster, have invented certain new and useful Improvements in Breached Ships' Patches, and likewise in auxiliary apparatus for affixing the same immediately, readily, and effectually, externally and internally, over breaches in ships, (for which I have obtained a patent in Great Britain, No. 11,964, dated September 21, 1886,) of which the following is a full, clear, and exact specification.

My invention relates to an apparatus or device adapted to be readily applied for the purpose of stopping or patching breaches in ships or the like, which may be the result of a collision or otherwise; and it consists of a series of oblong blocks of hard wood connected together and having a rubber facing, with means for applying same, all as hereinafter described.

To clearly explain the nature of my invention, reference is made to the accompanying drawings, in which—

Figure 1 is an elevation, partly in section, of a portion of the apparatus, or, as it is hereinafter termed, the "patch." Fig. 2 is a plan or bottom view showing the rubber facing or the side which is applied to the ship. Fig. 3 is a plan or bottom view with the rubber facing removed and partly in section, the view being taken on the line *x x*, Fig. 1. Fig. 4 is a section on the line *y y*, Fig. 1. Fig. 5 is a section on the line *z z*, Fig. 1. Fig. 6 is a view, partly in section, of a bolt-coupling of the attaching device. Fig. 7 is a view of a plate for holding the dowel-pins which connect the blocks. Fig. 8 is a plan view, partly in section, of the attaching-clamp. Fig. 9 is a sectional elevation on the line *v v*, Fig. 8. Fig. 10 is a section, partly in elevation, on the line *w w*, Fig. 8. Fig. 11 shows a roller applied to one of the blocks of the patch. Fig. 12 is a plan view of same, and Fig. 13 is a view showing the application of the patch to a breach in a ship's side.

The patch is composed of a number of blocks 1 of hard wood, preferably of hexagonal shape, as shown, though they may be round or of other shapes, the base of each being concave, while it is also bored throughout its length to receive a boss 2, terminating in a bolt 3, secured on the block by a nut 4, let in so as to be flush with the upper surface of the block, said nut being provided with pin-holes 5 for the reception of a tool in screwing on. The boss 2 has a concavo-convex flange 6, in which are six slots 7, radiating from the center. These slots are provided for the reception of short lengths of chain 8, one end of each being secured therein by means of a screw 9, while the other end is secured to a corresponding screw in the block next to same, the blocks in this way being flexibly secured or hinged to each other at the base. The interior of the boss 2 is screw-threaded to receive a second boss 10, having a flange 11 of concavo-convex form, which flange has pin-holes 12 for the reception of a tool in screwing up. Before this boss 10 is placed in position in making up the patch a rubber sheet 13 is laid over the flanges 6, constituting the bottom of the blocks 1. This sheet has holes in same, through which the bosses 10 are passed as they are screwed into the bosses 2, the flanges 11 compressing the rubber up against the flanges 6, annular rims or projections 14 on the bosses 11 affording a greater hold on the rubber. In this way the surface of the block is formed of a number of cavities or concave faces, the rubber edges of which act as a species of sucker when the patch is pressed up by the weight of water against the ship's side or the like.

About midway of the blocks 1 further means of connecting same together are employed. These consist of dowel-pins 15, one being screwed into every alternate face of the blocks 1, while the heads of same have ears 16, which engage with slotted plates 17, covering openings 18 in the blocks. The heads of these pins 15 are passed through the slotted openings in the plates 17, Fig. 7, and the pin is then turned so that the ears engage with the plate, though the head is permitted play in the opening 18.

To keep the blocks apart, so as to give the patch a curved surface adapted to a ship's side, rubber ties or buffers 19 are employed between the blocks above the dowel-pins 15.

These are shaped, as shown, with a head and an enlarged portion at the middle. They are arranged in the same way as the dowel-pins—viz., with a head in every alternate face of the block, the heads in this case being firmly held by a plate 20. The face of the block which receives the end has a hole bored in same, the mouth of which is reamed out, as shown at 21, so that the enlarged portion of the rubber tie may be compressed into same when the blocks are forced together at their outer ends. The ends of the ties are readily placed in these holes while the head is held by the plate 20. For the purpose of holding the patch up to the breach in the vessel the boss 10 is screwed internally throughout its length to receive a rod 22, which is screwed into same and into the boss 2, which is also screw-threaded at 23 to receive same, so that the pull of the rod is thrown directly onto the bolt 3 and nut 4. This rod is screwed into the bosses by means of a nut 24, Figs. 6 and 13, which affords a hold for a wrench, said nut being prevented from turning on the screwed rod by means of a pin 25 passing through the nut and rod. The rod terminates in a ball 26 held in a socket 27 on a rod 28. This socket is formed in halves which are screwed together, the upper one being slipped over the rod 22 on the ball before the nut 24 is put on. The rod 28 passes into a boss 29, Figs. 8, 9, 10, and 13, having trunnions 30 30, and is secured to same by a nut 31. The trunnions of this boss are adapted to be held in grooves 32 of a right-angle clamp 33, which can be affixed to the broken edges of the ship's plate.

In Figs. 8 and 13 the plates 34 (which usually are bent inward at about right angles to the ship's side when stove in) are shown as placed between the fixed jaws 35 35 of the clamp, and are held therein by one or more vise-screws 36, by which the plate is pressed against the grooved and serrated face of one of the jaws 35. In this way the angle at which the plates are bent will, within certain limits, as provided for by the ball-socket joint between the rods 22 28 and the swinging boss 29, generally enable some of the clamps to be applied. On the inside face of the patch around the edge of same a flexible india-rubber pipe 37, Fig. 13, may be secured. This pipe may be inflated with air from a pump, and will serve to make water-tight any remaining crevices which may be caused by reason of the overlapping of the ship's plates or irregularity in the sides.

In applying the patch to a ship ropes are attached to it, (preferably to some of the chains 8,) and it is then thrown over the ship's side, with the rubber face on the surface of the water. The weight of same causes the outer end to sink until it is upright, when it will be caught by the inflowing current of water and driven against the sides of the breach. A flat rope 38ª, Fig. 13, is then passed over the ship's side and under its keel to temporarily brace the patch in position. To assist in passing this over the patch, it is sometimes convenient to place a roller 38, Figs. 11, 12, and 13, on some of the blocks, suitable brackets being provided to carry them. The inflow of water being then stopped, the pumps may be set to work, if the patch is below the water in the hold of the vessel, and a sufficient number of rods 22 may be screwed into such of the holes of the bosses 10 as are in sight when the patch is uncovered. The clamps 33 are then placed on convenient edges of the stove-in plates, the bosses 29 of the rods 28 being adjusted in said clamps by seating their trunnions in the most convenient of the grooves 32, the ball-socket joint between the rods 28 and 22 being a further aid to same.

In the event of the patch being applied to a breach in a wooden ship the clamps are dispensed with, a balk or balks of timber being placed over the opening inside the vessel, through which the rods 28 (or 22, if the ball-socket joint is dispensed with) are passed and to which they are bolted. These balks of timber would be prepared beforehand and would preferably have holes bored in same corresponding in distance from each other to the holes in the bosses 10.

What I claim, and desire to secure by Letters Patent, is—

1. A patch for repairing breaches in ships and the like, consisting of a number of blocks flexibly connected together, so as to present a variable curved surface to a ship's side, having a rubber surface with a series of concave holding-faces, substantially as described.

2. A patch for repairing breaches in ships, consisting of a number of hard-wood blocks having bosses secured on same, means for flexibly connecting said blocks together at the base and about midway of same, means for keeping them apart to preserve a curve in the patch, a rubber sheet plated on the inside surface of the blocks, and bosses 10, adapted to be screwed into the first-named bosses and to draw the rubber sheet up into a series of concave faces, said bosses being adapted to receive screw-threaded rods for holding the patch in position, substantially as described.

3. The combination, with a patch for breaches in ships, consisting of a number of blocks flexibly connected together, so as to present a variable curved surface to a ship's side, having a rubber surface with a series of concave holding-faces, and means for receiving screwed rods, of right-angle clamps adapted to be affixed to the broken edges of the ship's plate and to receive the trunnions of swinging bosses, to which the rods or intermediate rods are connected, substantially as as described.

4. The combination, with a patch for breaches in ships, consisting of a number of blocks flexibly connected together, so as to

present a variable curved surface to a ship's side and having a rubber surface with a series of concave holding-faces, of a rubber tube placed around the edge of said patch and adapted to be inflated with air, so as to fill up irregularities in the ship's side, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of September, 1888.

JOHN HAIGH SMITH.

Witnesses:

JOHN SMALLSHAW,
Solicitor, Southport.

JOSEPH MURPHY,
His Clerk.