

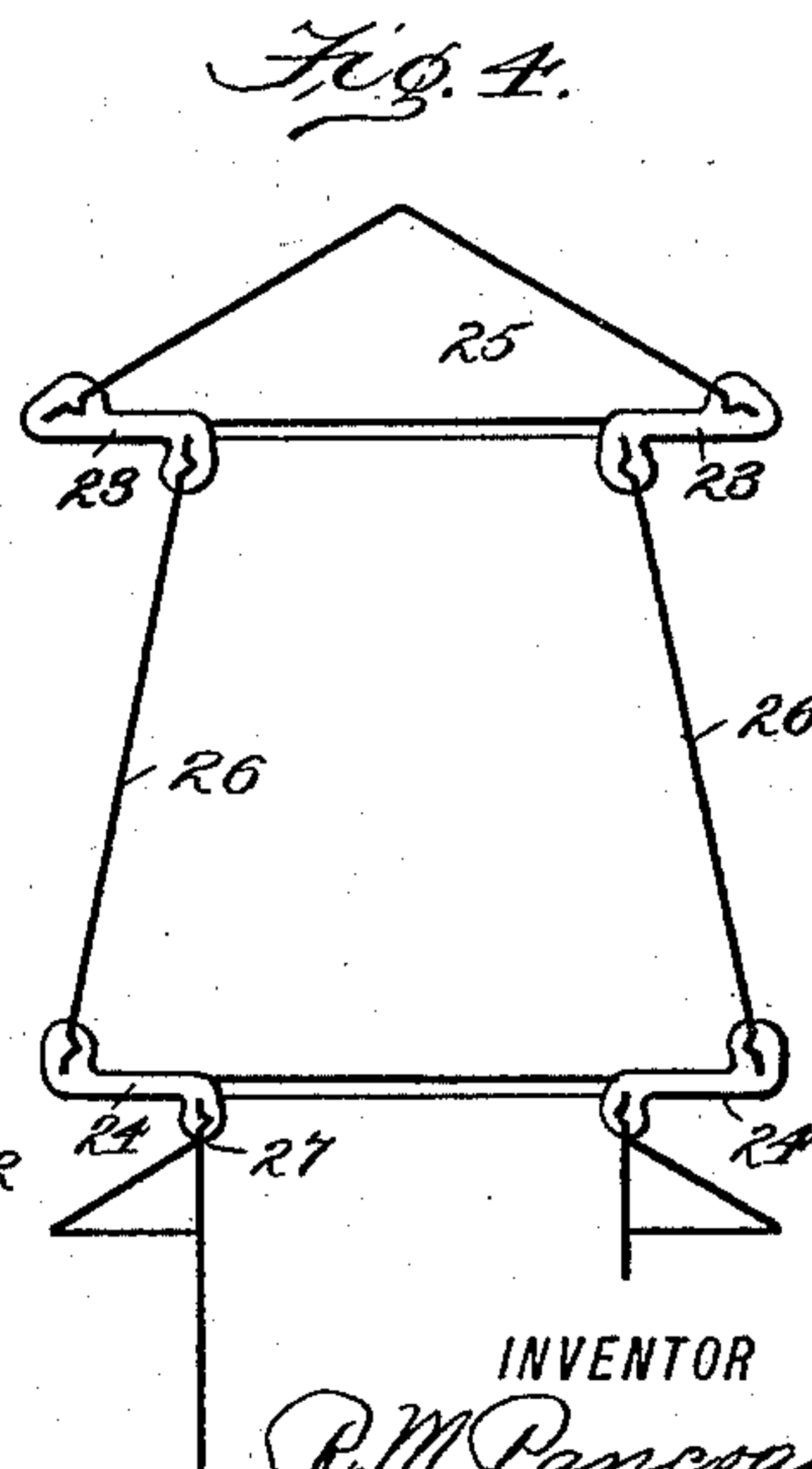
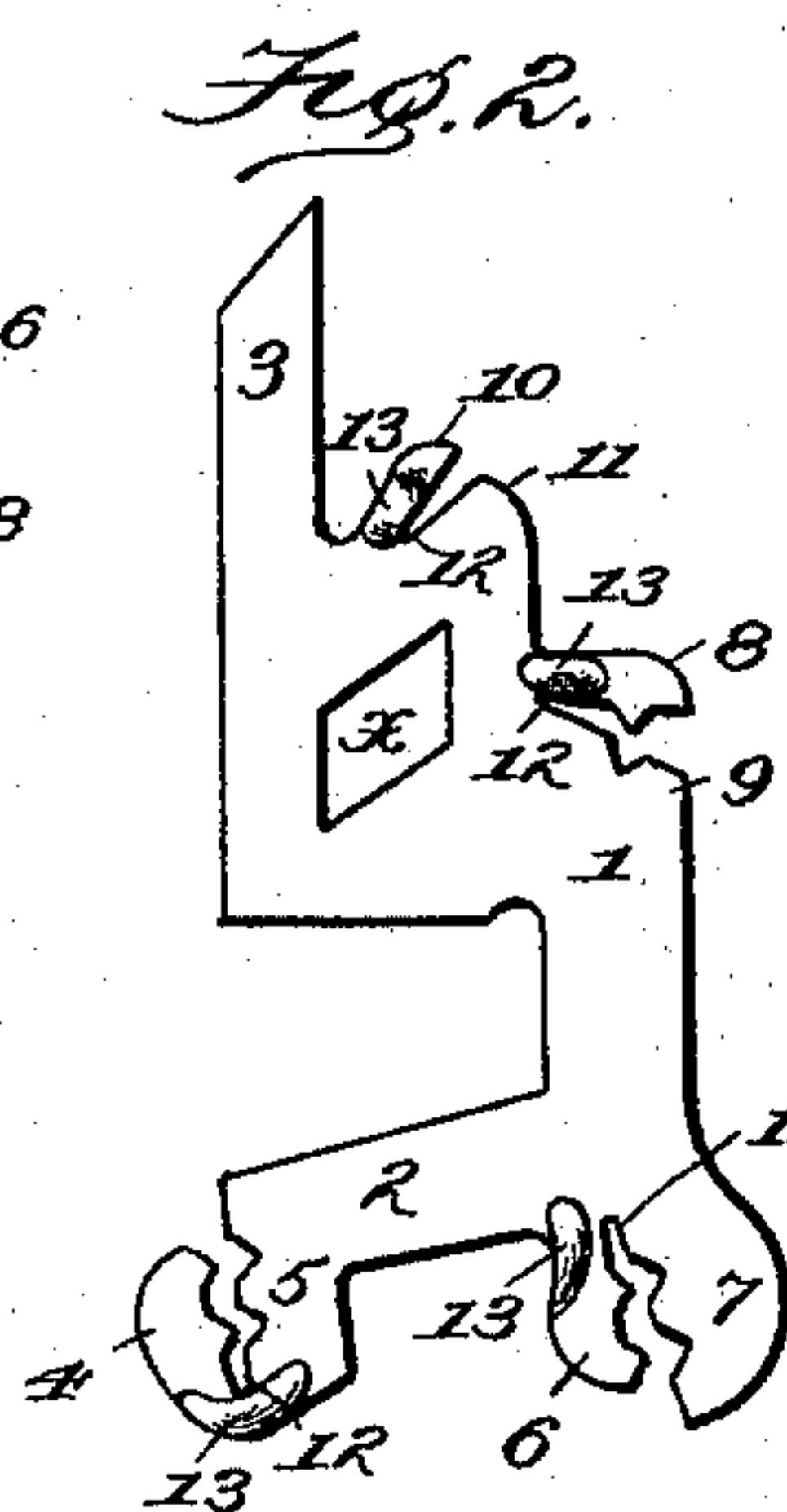
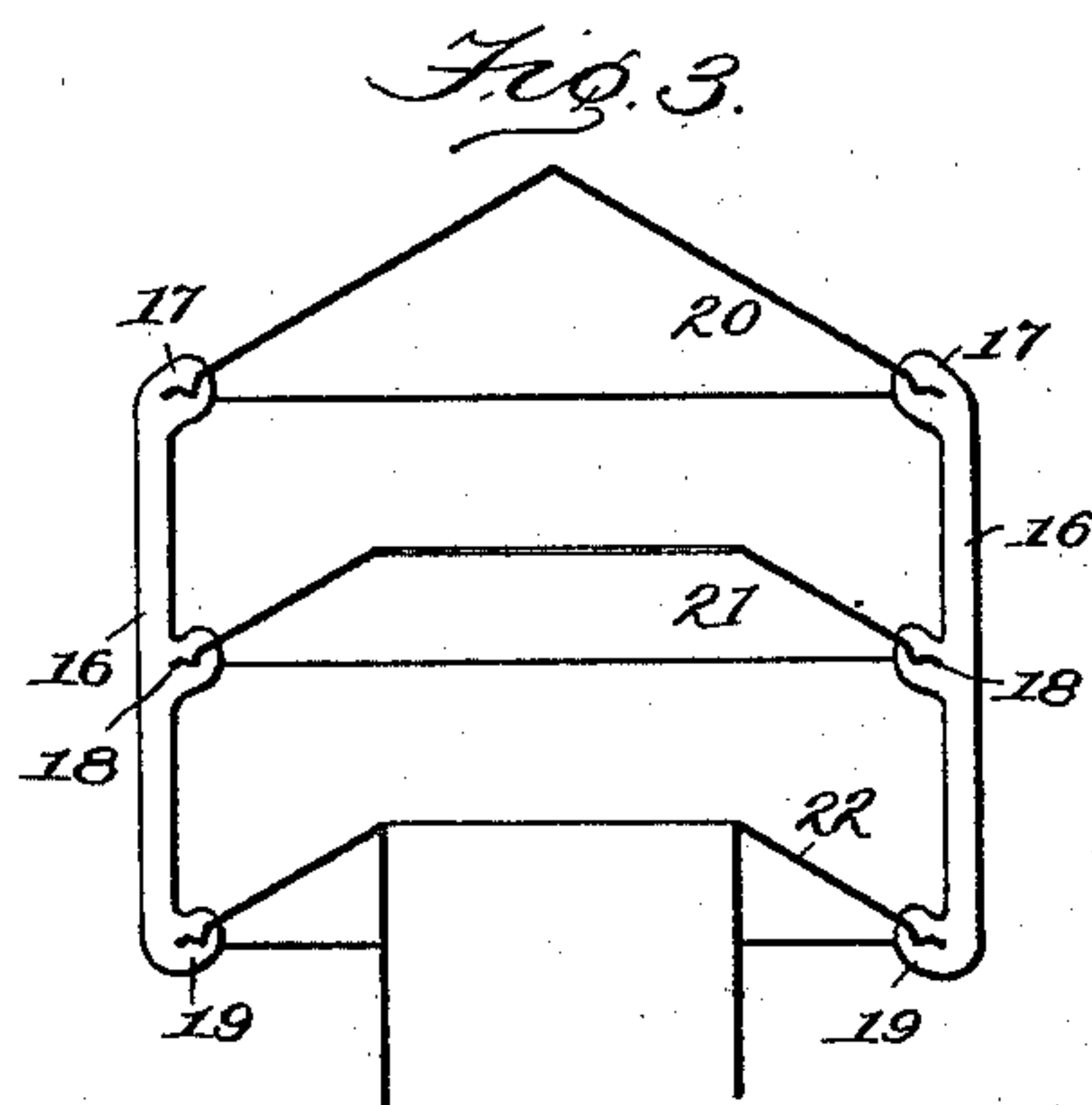
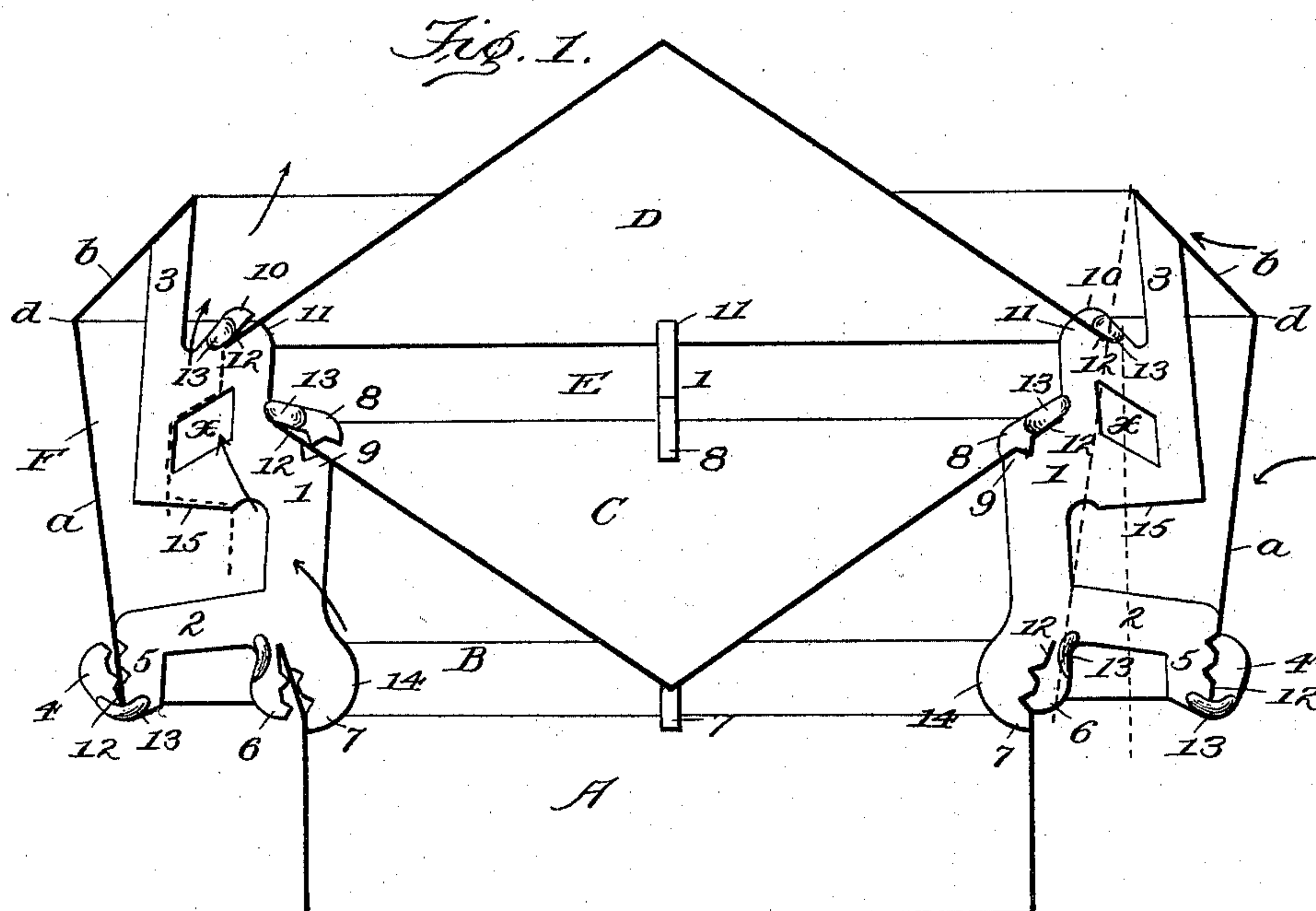
(No Model.)

2 Sheets—Sheet 1.

R. M. PANCOAST.  
VENTILATOR AND VENTILATOR BRACE.

No. 605,508.

Patented June 14, 1898.



**WITNESSES:**

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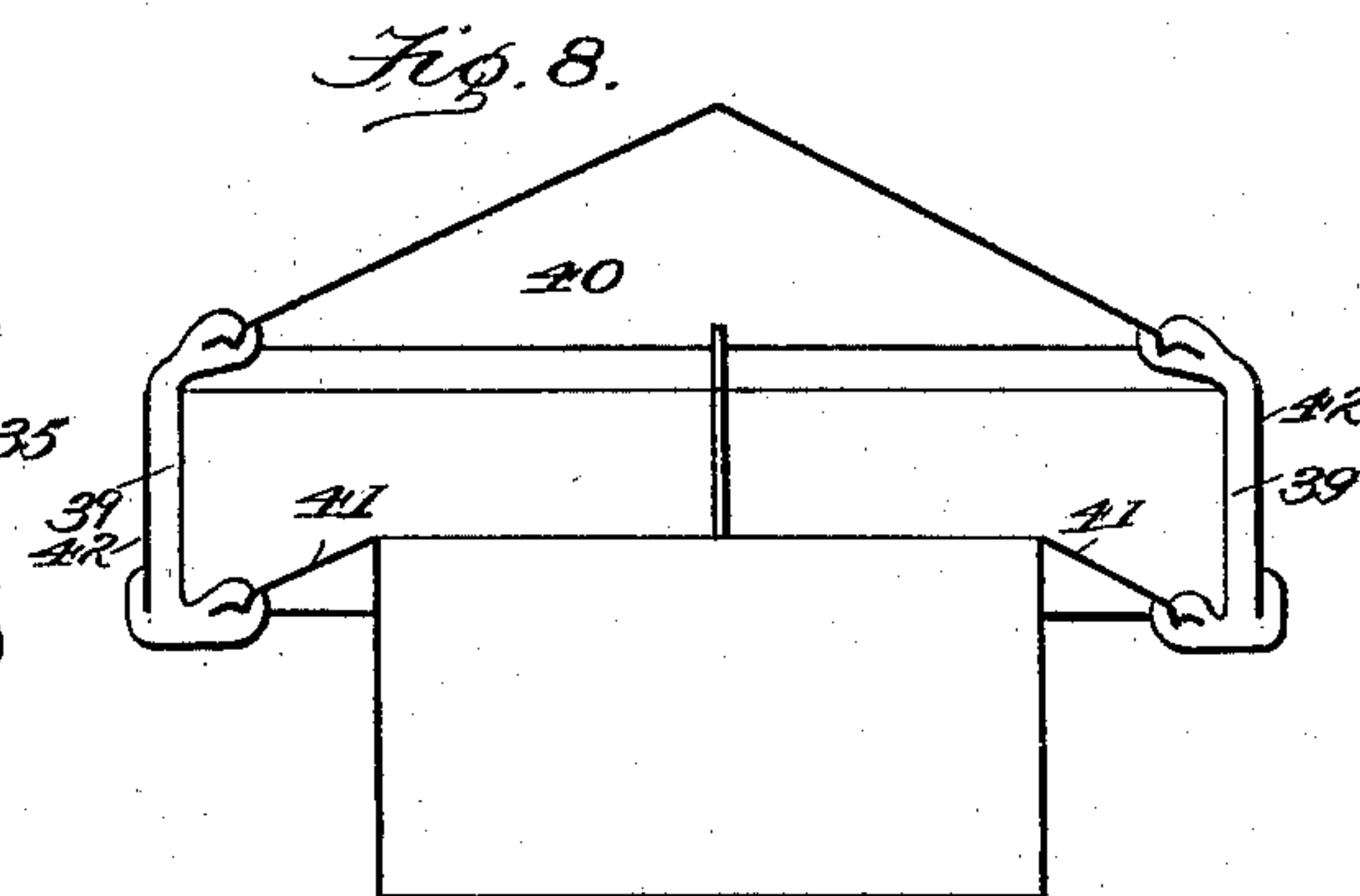
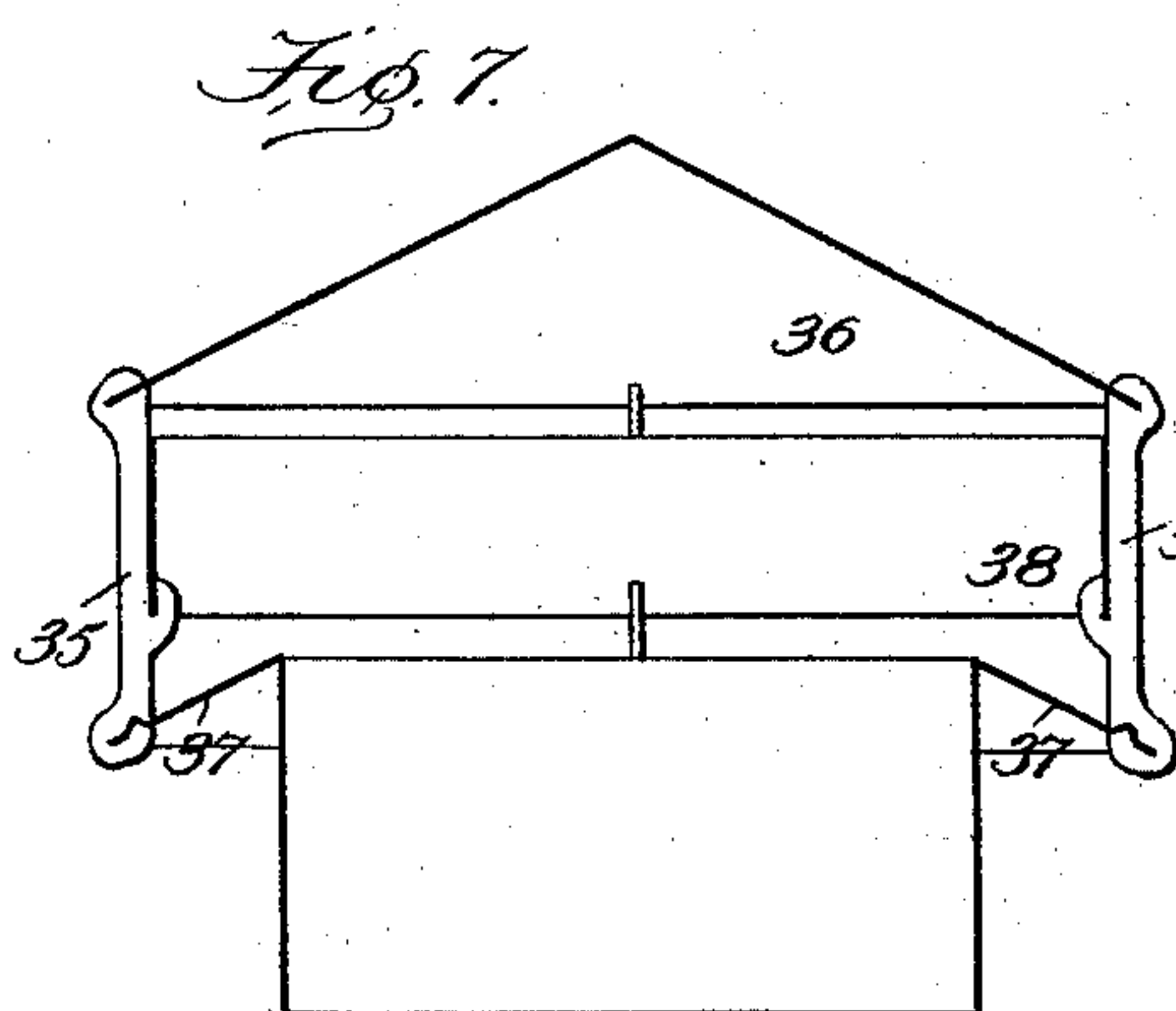
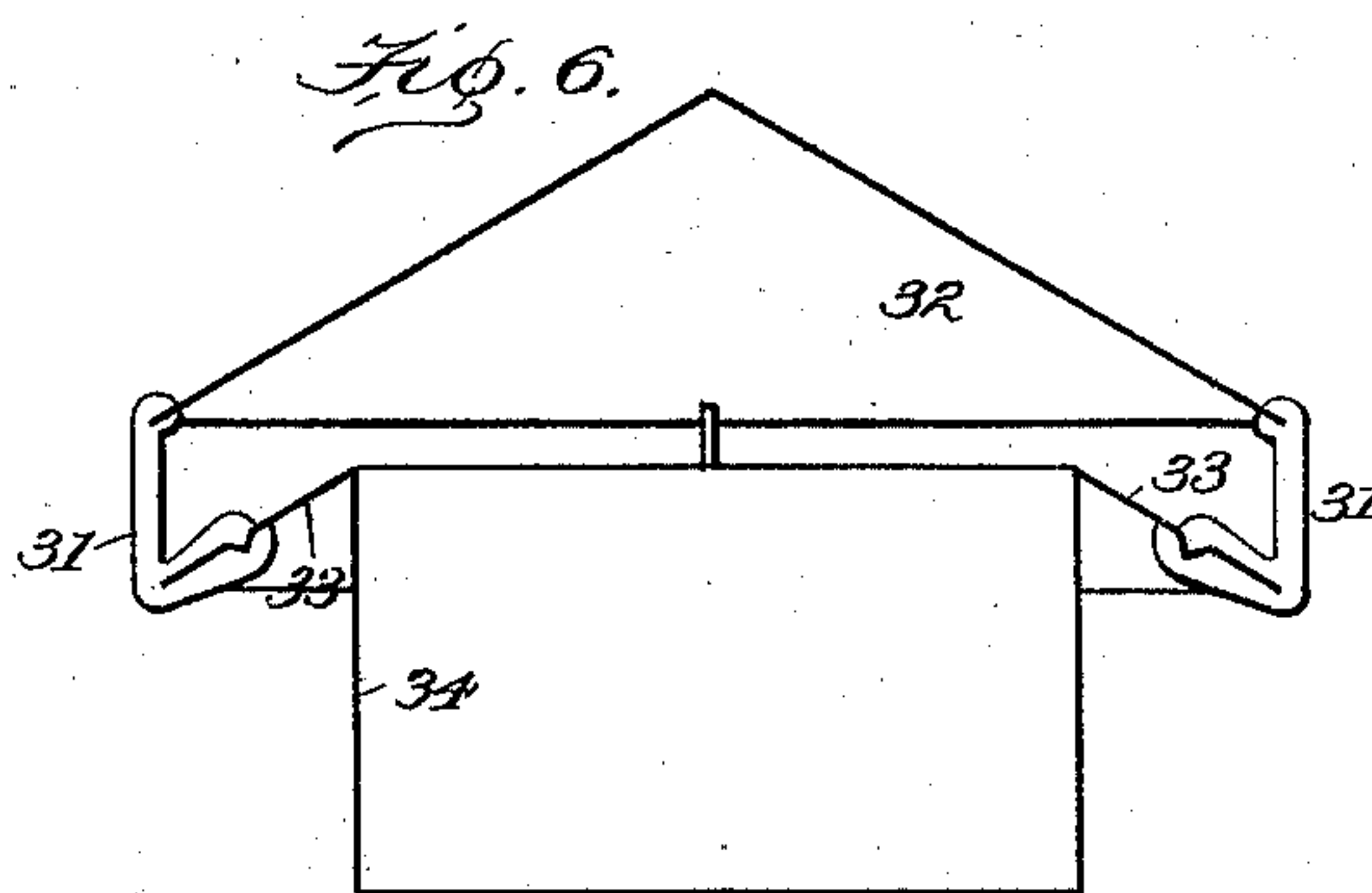
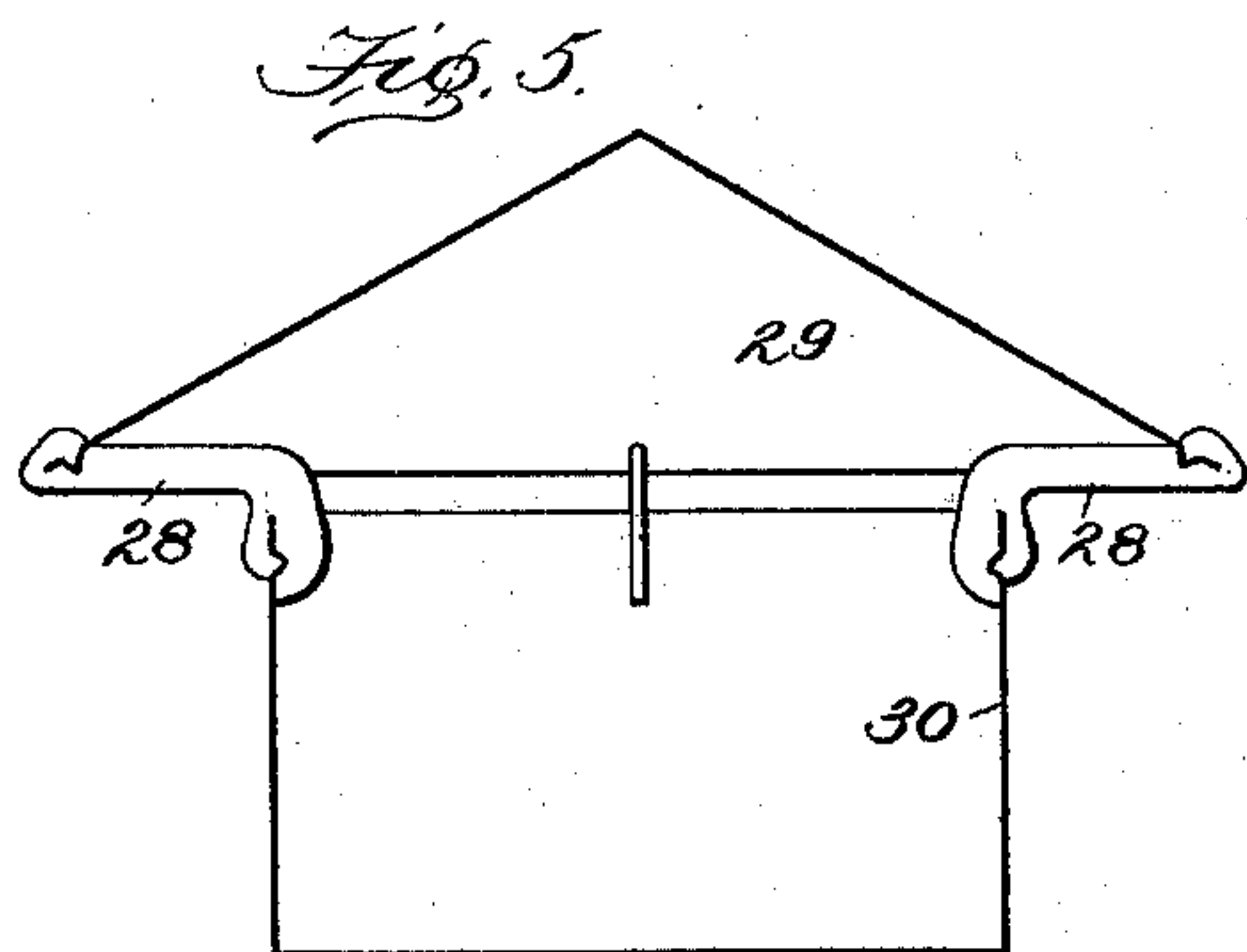
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2 Sheets—Sheet 2.

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WITNESSES:

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# UNITED STATES PATENT OFFICE.

RICHARD M. PANCOAST, OF CAMDEN, NEW JERSEY, ASSIGNOR TO THE  
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## VENTILATOR AND VENTILATOR-BRACE.

SPECIFICATION forming part of Letters Patent No. 605,508, dated June 14, 1898.

Application filed August 31, 1896. Serial No. 604,371. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD M. PANCOAST, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Ventilators and Ventilator-Braces, of which the following, taken in connection with the accompanying drawings, is a specification sufficiently full, clear, and accurate to enable those skilled in the art to make and use the same.

The objects of my invention are, first, the production of a ventilator which shall be comparatively cheap in first cost, simple in construction, effective in deflecting off down currents of air and rain without materially interfering with the free egress of air from the interior, and which will be effective when the wind blows in whatever direction and will not choke in a calm; second, the production of a ventilator-brace which can be cheaply, quickly, and easily applied, which will unite and hold the several parts of a ventilator together very rigidly and securely, thus preventing deformation or sagging, which will not appreciably obstruct the egress of air, and which will insure relative uniformity and symmetry in construction.

With these objects in view my invention consists, first, in constructing a ventilator with a neck, two cones having their bases adjacent each to the other but with an opening between, the diameter of the upper cone being greater than the diameter of the lower cone and that of the neck, and a deflector surrounding the opening between the cones and the opening between the lower cone and the neck; second, in forming a ventilator-brace of thin malleable metal and providing the same with plain or serrated jaws adapted to receive between them the edges of constituent parts of a ventilator and to be closed down upon said edges, so as to hold the parts rigidly and firmly in their proper relative positions.

One example only of a ventilator constructed by, perhaps, the best mode I have so far devised for embodying the principle is illustrated in the drawings. Several examples, however, of the ventilator-brace are shown, each example modified to adapt it for uniting

the several elements of differently shaped or constructed ventilators. From a study of these forms others can be readily devised adapted for other styles.

Figure 1 is a sectional view of a ventilator embodying my invention, showing the relative disposition of the cones, deflector, and neck, the several parts being united by my novel brace. Fig. 2 is a view in elevation of an edgewise clamp-jaw brace with four pairs of jaws in open position and reinforced adjacent the bending-points of the jaws by integral lugs. Fig. 3 shows an edgewise brace having three pairs of jaws and adapted to a particular form of ventilator. Fig. 4 is a view of a ventilator having its parts united by braces having two pairs of jaws. Fig. 5 shows a ventilator made up of a cone-cap and a neck united by an edgewise brace having two pairs of jaws. Fig. 6 is a view of a ventilator in which a cone-cap and a neck provided with an apron are united by a brace having two pairs of jaws. Fig. 7 is an example of a brace having three pairs of jaws uniting a cone-cap, a neck provided with an apron, and a deflector within the area of the circumference of the cone-cap. Fig. 8 is a view of a ventilator quite like that shown in Fig. 7, but with the deflector located adjacent the edges of the cone and apron, all the elements being united by an edgewise clamp-jaw brace provided with three pairs of jaws.

In Fig. 1, A is the neck of the ventilator, made slightly flaring at the edge B, as shown.

C is the lower, and D the upper, cone. These cones are located some distance apart in parallel planes, so as to provide an opening between them, as at E. The diameter of the lower cone C is approximately the same as the diameter of the neck at B in small sizes, but is greater in larger sizes, and the diameter of the upper cone D is sufficiently greater to insure the rain or snow or other matter falling thereon being deflected over the drip-edge, so as to pass outside the flaring edge B of the neck, as illustrated by dotted line at the right in Fig. 1.

F is an outside deflector, made tapering both upwardly and downwardly from the point *d*. It is located some distance from and surrounds the opening between the cones and the open-



ing between the lower cone and the neck. If desired, this deflector may be made in two pieces *a* and *b*, joined together. Its lower edge should lie in a plane below the plane of the upper edge of the neck and its upper edge should lie in a plane sufficiently above the plane of the edge of the upper cone as to prevent ingress at any angle to the neck-opening from above. (See oblique dotted anti-ingress line to left of vertical dotted drip-line, Fig. 1.)

As thus constructed the ventilator is "storm-proof," for it guards off down currents of air and deflects rain, snow, cinders, &c., in falling to the outside of and beyond the edge B of the neck. It is likewise adapted to increase the updraft, by reason of the peculiar construction of the deflector F, from whatever direction the wind may blow, for the air in motion impinging against the surface of the upper part *b* is deflected and induces a current outwardly from below the cones.

It is to be particularly observed that the exit passage-way between the deflector F and the edges of the cones is of uniform area throughout and substantially of the same area as the opening of the neck; also, that the path of the outwardly-flowing air has an exceedingly short lateral divergence and forms a widely-extended obtuse angle, characteristics of much importance in view of the laws governing the movement of air in pipes. The cone C is adapted to deflect the upwardly-moving currents of air to the opening between the deflector F and the edges of the cones without producing choking eddies or counter-currents, which are themselves effective obstructions to free delivery.

In my patent of June 7, 1892, No. 476,682, is shown a ventilator having an arrangement of two cones connected by a flange or band, forming a closed head. In manufacturing it was found that such arrangement cost, in time of adjusting and labor of putting together, as much as all other expenses connected with the making of the cowl. To overcome this objection, I devised the ventilator hereinbefore described, in which the cones are not thus united together.

The several parts of the ventilator may be held in their relative positions in any desirable way; but I prefer to use for that purpose my novel edgewise clamp-jaw brace, as shown. This brace is preferably made of malleable cast metal or cast to shape and afterward malleableized by any well-known method, so that certain parts may be bent without breaking; but it can be cold-forged or cut from soft metal.

Fig. 2 shows a form of my brace especially adapted to unite the several parts of the ventilator, hereinbefore described, and illustrated in Fig. 1. 1 is the body of the brace, 2 and 3 are arms integral therewith, and 4 5 6 7 8 9 10, 11 jaws for receiving the edges of the several constituent elements of the ventilator. These jaws may be made with teeth, as shown, those

on one jaw adapted to fit the spaces between the teeth on the opposite jaw or to register with recesses therein, or they may be made plain, as shown by jaws 10 11. The jaws 5 7 9 11 are preferably somewhat wider than jaws 4 6 8 10 and formed quite strong and rigid, so as to keep their proper shape. The jaws 4 6 8 10 are, however, adapted to bend at the points 12, whereby the two jaws of each pair may be brought together and grip the edges of the metallic elements of the ventilator placed between. It should be observed that the outer jaws in each pair are designed to be bent only at the point 12 and not throughout their length, thus insuring frictional contact of the jaws and interposed metal throughout their entire surfaces.

In small-sized ventilators the body of metal at points 12 is sufficient to give the required strength and rigidity; but the larger sizes require a reinforcement at point 12, and I therefore provide the brace with lugs 13 on one side only, as shown, or on both sides, if desired. These lugs, besides adding strength and rigidity to the ventilator when constructed, are serviceable in preventing the jaws 4 6 8 10 from being broken off when the casting is drawn from the sand or when subject to careless handling or rough usage during the process of cleaning and of malleableization.

In assembling the parts of the ventilator first the edge B of the neck is inserted between the jaws 6 7 of the brace, as shown at the left in Fig. 1, where each pair of jaws is represented in open position. The point 14 of jaw 7 is then supported on an anvil or otherwise and jaw 6 is hammered down, so as to firmly grip or crimp the metal edge between the jaws or force the teeth into or through it. The edge of the cone C is next inserted between jaws 8 9, the point 15 supported on a rest, and jaw 8 closed down. Then cone D and deflector F are each respectively secured between jaws 10 11 and 4 5 in an analogous manner, the upper part *b* of the deflector resting when in position upon the arm 3 of the brace. At the right in Fig. 1 all the jaws are shown closed down on the several parts.

The number of braces used for each ventilator is determined by the size and the strength and rigidity required and is left to the choice and judgment of the manufacturer. The number and location of the teeth on the jaws are likewise to be determined by particular conditions. In Fig. 1 I have shown the jaws which hold the neck and deflector each provided with two teeth and the jaws which grip the upper cone made plain, inasmuch as the upper cone is subjected to much less strain than the neck and deflector. I also prefer to cut out or omit part of the metal from the body of the brace, as at *x*, for the purpose of diminishing the weight of the same and also to aid in leading off any water which might



flow down the side of the brace and otherwise make its way inside the neck. (See dotted line at the left in Fig. 1.)

The particular edgewise clamp-jaw brace specially described is adapted for securing together the several parts of the ventilator shown in Fig. 1. Other examples of the brace are illustrated in Figs. 3, 4, 5, 6, 7, and 8.

In Fig. 3 the brace 16 is provided with three pairs of jaws 17 18 19, which grip the edges of cone-cap 20, disk 21, and neck-apron 22.

In Fig. 4 two sets of braces are employed, 23 24, each having two pairs of jaws for uniting the cone-cap 25, deflector 26, and neck 27.

In Fig. 5 braces 28, with two pairs of jaws each, unite a cone-cap 29 and neck 30.

In Fig. 6 braces 31 of a different form, each having two pairs of jaws, engage the edges of cone-cap 32 and the apron 33 of the next, 34.

In Fig. 7 braces 35 are shown, each having three pairs of jaws for engaging, respectively, a cone-cap 36, an apron 37, and a deflector 38, located adjacent the inner edge of the brace.

In Fig. 8 the braces 39 also have three pairs of jaws, one pair of each brace gripping the edge of the cone-cap 40, another the apron 41, and a third pair the deflector 42, located exterior to the outer edges of the cone and apron and braces. These various examples of braces are shown for the purpose of illustrating their adaptation to different constructions of ventilators, hoods, cowls, and caps and not as being exhaustive of all possible forms of their embodiment.

My style of brace has several advantages over others heretofore known. An edgewise brace, flat toward the center of the cone, presents as much less obstruction to the egress of smoke, foul air, &c., as it is narrower than wide, and every brace is several times narrower than wide. Edgewise braces are in some use, I believe, for this purpose, but are expensive to make, being formed of flat malleable-iron strips, by bending or twisting the ends to a right-angular position to the body of the brace for adapting the same to be riveted to the sheet-metal edges of the parts of the cone; but the usual practice is to simply use flat braces, flatwise toward the center, thus seriously or at least objectionably interfering with the free and uninterrupted outflow of smoke, gases, &c.

My design of brace, whether cast and made malleable by baking, which is cheaper, or cold-forged from soft iron, is necessarily true and accurate as designed, every one of each size being exactly of the same dimensions. This insures accuracy in the cowl and also greatly facilitates its construction. No measuring or cutting by hand of every brace. No measuring and driving of holes in the sheet-metal parts as well as the braces for riveting, and if not exactly true the cone-head will set skewed out of shape. No placing in and heading of rivets in my design.

The mouths of my design of brace are the

unmistakable measure and the uniform seats for the edges of the ventilator-pieces. These pieces being made true, it simply remains to put their edges into the mouths of the braces and close the jaws, which can be done by cheap labor and does not need skilled-mechanic labor, as does the old method.

It is to be observed that when the edges of the ventilator parts are properly in the mouths of my braces said edges and parts are necessarily in their true relative positions and the ventilator cannot have a "cant" or be "lopped-sided," or in any way other than "just about" as proportioned and designed to be. Therefore every part is required to be in its designed position by simply using the clamp-jaw braces. Moreover, an edgewise brace, as shown, is far more rigid than any other, and, made with clamp-jaws, is stronger.

The smaller sizes of the ventilator are commonly made up of black sheet metal, the several parts—cones, deflector, and neck—being joined by my edgewise brace, then the entire structure galvanized, thus leaving no raw or unprotected edges to rust and at the same time cementing the closed jaws to the sheet-metal parts, making the structure as strong as though formed integral. The larger sizes (too large to dip) are generally made of galvanized metal and the points where the jaws grip the metal soldered together. However the brace is applied it forms a very strong and rigid structure, which cannot be seriously distorted or bent out of shape when subjected to careless handling in shipment or severe strains in service.

While I have illustrated several specific forms of my edgewise clamp-jaw brace and its adaptation to several varieties of ventilators, I do not wish it understood that these forms are exhaustive of my invention, inasmuch as other forms may readily be devised which will serve the purpose, have all the functions, and possess the desirable characteristics of my brace. All such constructions and forms I intend to embrace within the scope of my claims.

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

1. The combination in a ventilator of the neck A; the cone C; the cone D made separate from cone C and with an open space E between; the deflector F; and means for securing the several enumerated parts in their proper relative positions, substantially as described.

2. An edgewise brace for holding in their proper relative positions the constituent elements of a ventilator, cowl, or cap, said brace being made of malleable metal and provided with jaws adapted to be closed down upon and to firmly grip the edges of the said elements, substantially as described.

3. An edgewise brace for ventilators having jaws adapted to be closed down upon the edges of constituent parts of a ventilator,



said jaws being serrated, substantially as described.

4. An edgewise brace for ventilators having jaws adapted to be closed down upon the  
5 edges of constituent parts of a ventilator, said jaws being reinforced adjacent the bending points of the jaws, substantially as described.

5. An edgewise brace for uniting the constituent parts of a ventilator, said brace being  
10 provided with arms, as 2 and 3, and pairs of jaws adapted to be closed upon and to finally grip the edges of the said parts of a ventilator, substantially as described.

6. An edgewise brace for securing together  
15 in their proper relative positions constituent

parts of a ventilator, said brace being provided with pairs of jaws, one jaw of each pair made rigid and the other adapted to be bent down, substantially as described.

7. The combination in a ventilator of a neck, 20 two cones, a deflector, and edgewise braces provided with jaws which grip the edges of the neck, cones and deflector and securely hold them in their proper relative positions, substantially as described.

RICHARD M. PANCOAST.

Witnesses:

JOHN V. OMMEREN,  
YOST. V. OMMEREN.