

E. D. CHADWICK.

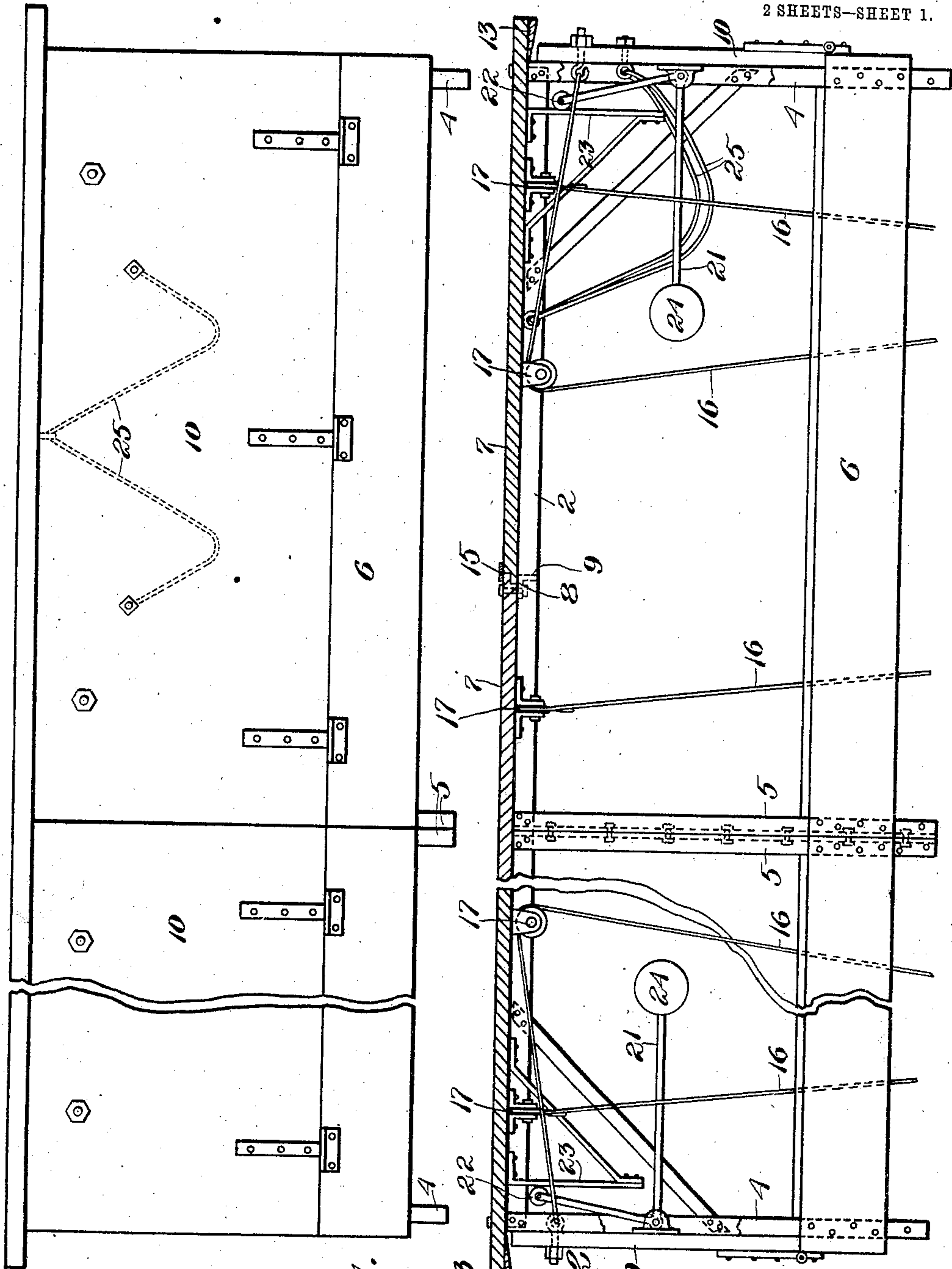
VENTILATOR.

APPLICATION FILED APR. 23, 1906.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 1.

950,839.



Witnesses:
Joseph T. Brennan.
C. S. Woodbury.

Fig. 1.

Fig. 2.

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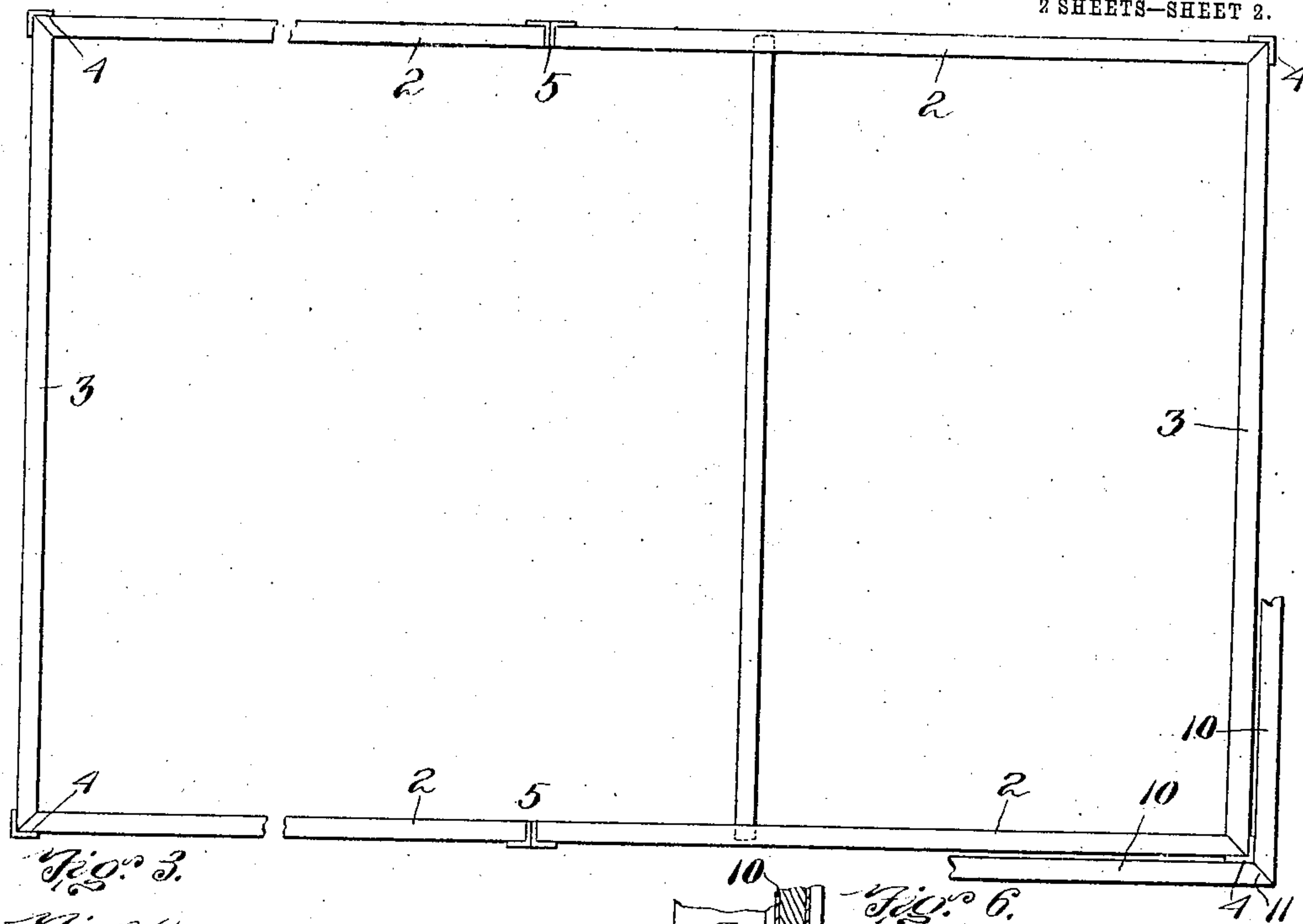


Fig. 3.

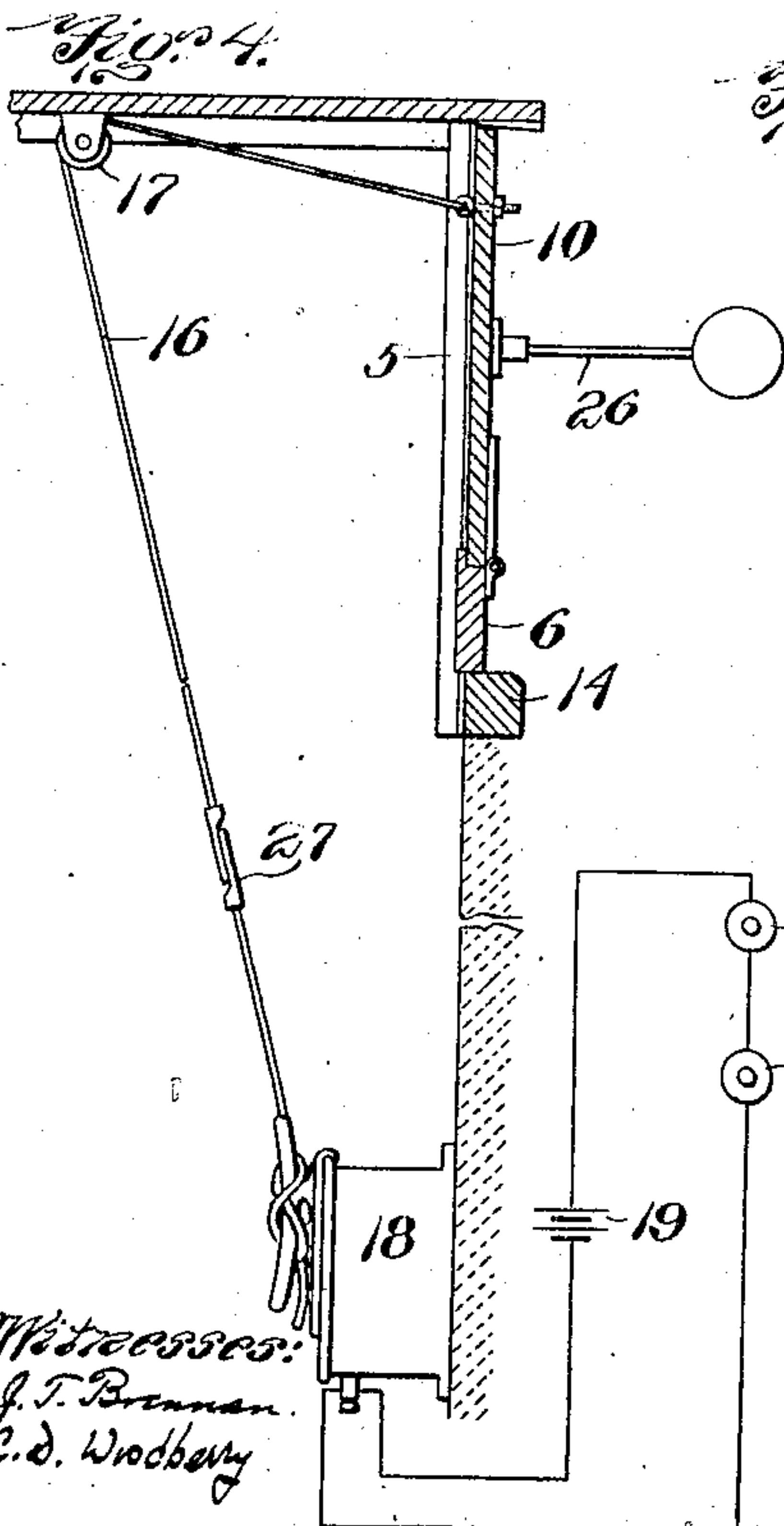


Fig. 4.

Fig. 5.

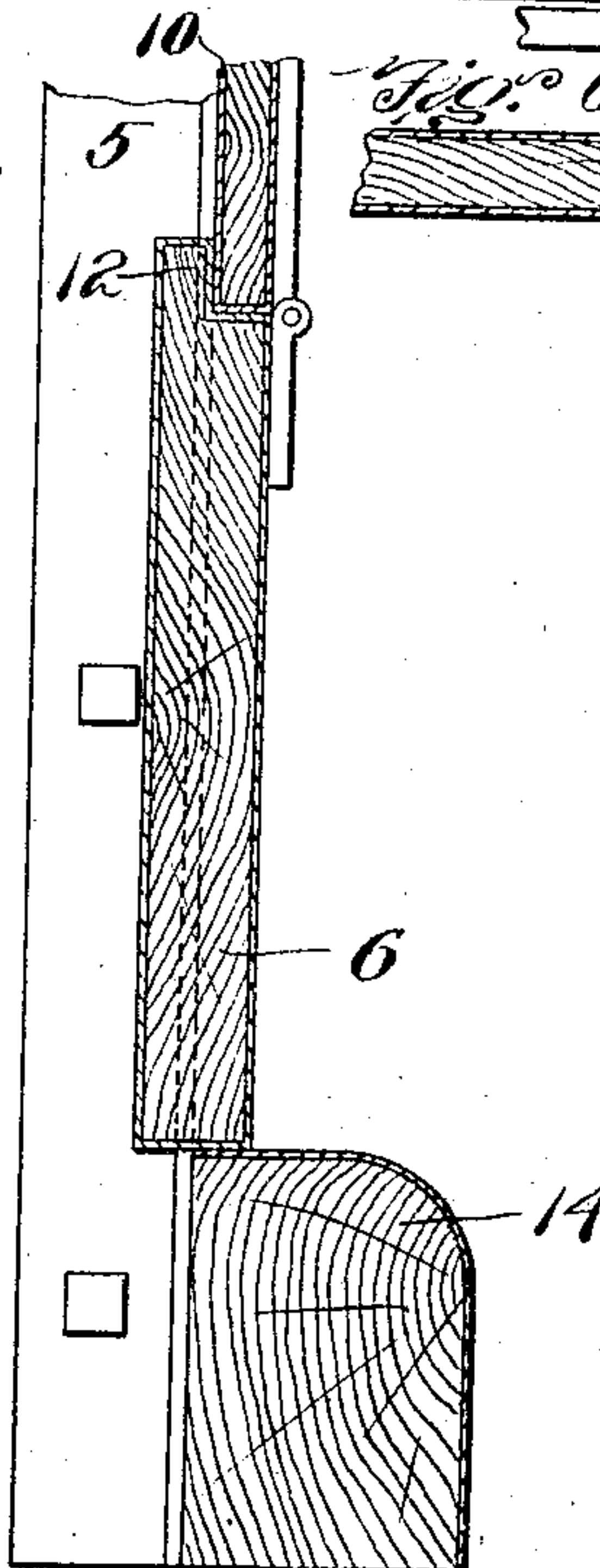
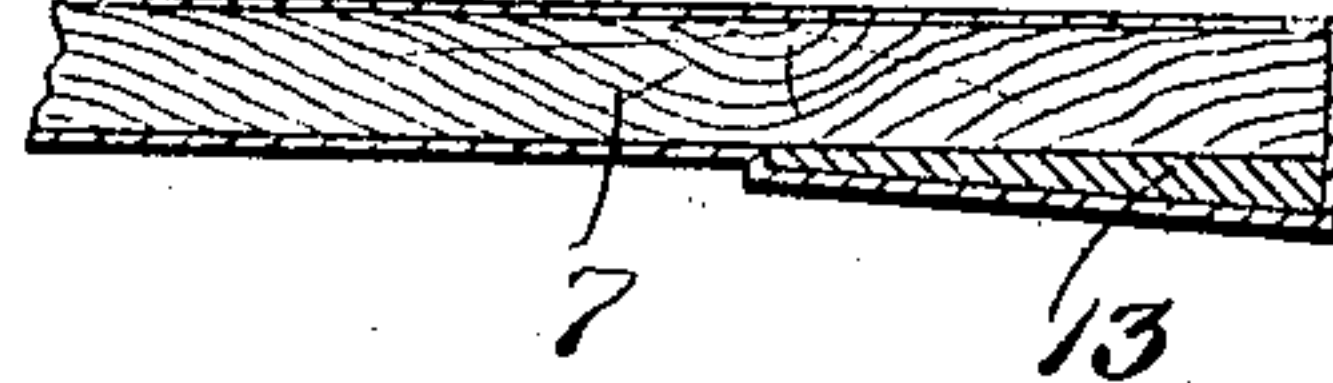


Fig. 6.



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UNITED STATES PATENT OFFICE.

EVERETT D. CHADWICK, OF WINCHESTER, MASSACHUSETTS.

VENTILATOR.

950,839.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed April 23, 1906. Serial No. 313,126.

To all whom it may concern:

Be it known that I, EVERETT D. CHADWICK, a citizen of the United States, resident at Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Ventilators, of which the following is a specification.

In many localities it is required by statute or municipal ordinance that every theater or other place of public assemblage having a stage shall be provided, over the stage, with a ventilator or shutter adapted to be opened automatically or manually in case of fire, so as to provide an outlet for smoke and flames and create a draft sufficient to carry the same away from the auditorium. It is desirable that such ventilators shall be of fire-proof construction, that they shall open outward, and that when open they shall provide an unobstructed outlet equal in area to at least one-tenth of the area of the stage floor, and my invention is intended to provide a simple and practical ventilator which will satisfy the above conditions and which may also be arranged to open automatically in case of fire as well as to be manually operated from any one of a number of different points on the stage or elsewhere.

In the accompanying drawings,—Figure 1 is a side elevation of a closed ventilator embodying my improvements in their preferred form; Fig. 2 is a similar view with the shutters on the rear side of the ventilator removed and showing the roof in section; Fig. 3 is a plan view of the frame with the roof removed, showing also a portion of two shutters at one corner of the structure. In these three figures the ventilator is represented as contracted in the direction of its length. Fig. 4 is a sectional detail view illustrating the connections between the shutters of my ventilator and the releasing devices; Fig. 5 is a detail view on a larger scale, showing the base of the ventilator and the manner in which it is mounted on a roof; Fig. 6 is a sectional view illustrating a detail of roof construction.

The frame of my ventilator is preferably made of angle iron, and consists at its top of horizontal side and end angle bars 2 and 3 made in as many lengths as may be convenient and bolted together and to upright angle bars 4 and 5, the bars 4 being located at the corners of the structure and the bars

5 at as many other points as may be necessary for strength and stiffness. According to the specific arrangement illustrated, the end of the horizontal bars 2 and 3 are mitered where they meet and are bolted to the inner faces of the vertical angle bars 4 and 5, as shown in Fig. 3, so that the angles of the latter point outward. Near their lower ends said bars 4 and 5 are bolted to and connected by a base board 6 extending entirely around the structure, to which base-board the shutters are hinged as hereinafter described, and on the top of the framework is supported a flat roof which is usually given a slight pitch sufficient to shed water easily, the upright bars being proportioned to accomplish this result. The roof and the base-board are preferably made of standard fire proof shutter construction, that is to say, of wood or planking completely covered and inclosed by sheets of tin with interlocked edges and preferably the roof is made in a suitable number of sections 7 which are rabbeted as at 8, Fig. 2, the overlapping edge of each section being bolted to an angle iron cross brace 9, as shown.

The space between the base board and the roof, around the periphery of the structure, provides the outlet or ventilating passages and is proportioned to have the required area according to the area of the stage over which the ventilator is to be used, and a suitable number of shutters 10 are provided for closing these passages, each shutter being hinged at its lower edge to the upper edge of the base board 6 and having such height that when closed it will just pass in under the projecting edge of the roof and abut against the framing. The meeting edges of adjacent shutters at each corner of the structure are preferably beveled, as shown at 11 in Fig. 3, so that when the shutters are closed these edges fit together over the vertical angle iron bar 4 at the corresponding corner. At other points the adjacent vertical edges of the shutters are arranged to come over the flat outer faces of a pair of the intermediate uprights 5. In either case the entrance of rain is effectively prevented, since any rain which is driven in between the adjacent edges of the shutters will be intercepted by the corresponding uprights and will run down the same and out over the base board. To the same end the upper edge of the base board is

preferably rabbeted on its outer side, as shown in 12, Fig. 5, the lower ends of the shutters being set into this rabbet, so that any water which runs down the inner face of a shutter will flow into the rabbet and thence outward under the shutter. As a further precaution against the entrance of rain under the overhanging edge of the roof, especially on the highest side of the latter, I prefer to face the under edge of the roof all the way around with a strip of wood 13 having a wedge-shape in cross section, like a clap board, and having its thicker edge outermost. This strip forms a part of the roof and is covered by the tin when the roof is made, thus giving the under side of the latter enough of a pitch outward at its edges to prevent water from running inward along the same.

The parts above described are detachably bolted together, by preference, and hence they may be constructed in sections and so transported to the place of assemblage, where they can be set up without difficulty. In setting up the structure, after a suitable opening has been made in the roof a ledge 14, Fig. 5, is built up around this opening to such a height as to present a horizontal base for the ventilator; and the latter is then mounted upon this base with the lower ends of the uprights 4 and 5 projecting downward inside of the base and with the base board resting upon it, whereupon said uprights are bolted to the base and the latter is connected to the roof by a flashing or any other suitable water-tight connection. The meeting edges of the roof sections 7 are preferably made weather proof by covering them with a strip of tin 15, Fig. 2, which is soldered thereto.

It will be seen that when the structure above described is set up, each shutter will be capable of opening outward independently of any of the others by turning on the hinges at its lower edge, and for controlling the opening of these shutters and closing the same as desired I provide each shutter with a rope 16 secured thereto near its upper edge and passed over a pulley attached to the under side of the roof, said rope being led thence to any convenient point where it may be detachably secured. In practice, I prefer to secure each of these ropes to a release box 18 so constructed that said rope may either be manually attached to or detached therefrom, or electrically released from one or more distant points. An electric circuit running from the release box 18 is shown in Fig. 4, which circuit includes a battery 19 and one or more push buttons or manual switches 20, and it will be understood that all the release boxes may be included in the same circuit, so that the shutters may all be released simultaneously. A release box suitable for this purpose is de-

scribed and claimed in my application for a patent filed on the 8th day of October, 1906, Serial No. 337,902 and is not specifically described herein, as the particular construction of such device is not material to the present invention.

In order to effect the instantaneous opening of each shutter when released, I prefer to employ the mechanism illustrated in Fig. 2, in which 21 represents an elbow lever pivoted at its angle to the inner face of one of the shutters 10 and provided at the free end of its uppermost arm with a roller 22 adapted to run on a fixed vertical track 23 secured to the roof of the structure. The other arm of said lever carries a weight 24, and the parts are so proportioned that when the shutter is closed the roller 22 is at the upper end of the track 23 and the weighted arm of the lever is in horizontal position or otherwise located to cause the roller to press against its track. When the rope which controls said shutter is released the effect of the weight 24 is to force the shutter outward, owing to the fixity of the track 23, and as said shutter opens the weight descends and the roller 22 simultaneously runs down to the lower portion of its track. The opening of the shutter may be limited by any suitable means such as one or more normally-slack stop ropes 25 secured at one end to the shutter and at the other end to the roof, and should be so limited that the roller 22 will not run off its track. When a shutter is closed by pulling on its rope 16, its roller 22 runs upward on its track and thus elevates the weight 24 to the normal position shown in Fig. 2. As an alternative means for causing the opening of the shutter, a weighted arm 26, Fig. 4, may be rigidly secured to the outside of the shutter, but I prefer the construction first described, because it can be made to operate more powerfully and is also protected from the effect of the weather, leaving the exterior of the ventilator free from projecting parts when the shutters are closed.

In order to render the opening of the shutters entirely automatic in case of fire, each of the ropes 16 may be provided with a suitable number of fusible links 27 of usual construction, and it will be noted that since each shutter and its operating parts are independent of all the others, so far as their operation is concerned, there will be practical certainty of the opening of at least one of the shutters in case of fire, even though the operation of the parts should be in some way interfered with.

It is one of the features of the described construction that any desired number of the shutters may be opened to any desired extent for ventilating purposes, without in any way affecting the other shutters or interfering with the readiness of the entire series

of shutters to be operated instantaneously and simultaneously in case of fire, but it is to be understood that the details of construction of my ventilator may be widely varied without departing from my invention.

I claim as my invention:

1. A ventilator comprising a framing providing side openings, a roof covering the same, a series of outwardly-opening shutters hinged at their lower edges and adapted collectively to close said openings, means for opening said shutters, and releasable means for restraining said shutters against opening movement, said releasable means comprising adjustable connections to permit the opening of any shutter to a variable extent.

2. A ventilator comprising a framing providing side openings, a roof covering the same, a series of outwardly-opening shutters hinged at their edges and adapted collectively to close said openings, means for opening said shutters independently of each other, flexible connections controlling the opening of said shutters, and means for detachably securing said connections.

3. In a ventilator, the combination with a framing of a shutter hinged thereto, releasable means for holding said shutter against opening movement, and means for opening said shutter when released, comprising a lever having a bearing at one end on the inside of the shutter and at the other end on a fixed part of the structure, and a weight connected to said lever and arranged to be held in elevated position by the shutter when the latter is closed.

4. In a ventilator, the combination with a framing of a shutter hinged thereto and adapted to open outward therefrom; releasable means for holding said shutter against opening movement, and means for opening said shutter when released comprising an elbow lever pivoted at its angle to the inner face of the shutter, a vertical track secured to said framing, one of the arms of the lever being arranged to travel on said track as the shutter opens and closes, and a weight carried by the other arm of said lever and held in elevated position by the engagement of said lever and track when the shutter is closed.

5. In a ventilator, the combination with a framing of a shutter hinged thereto at its lower edge and adapted to open outward therefrom, releasable means for holding said shutter against opening movement, means for opening said shutter when released comprising an elbow lever pivoted at its angle to the inner face of the shutter, a vertical track rigidly secured to said framing, one of the arms of the lever being arranged to travel on said track as the shutter opens, a weight carried by the other arm of said lever and held in elevated position by the

engagement of said lever and track when the shutter is closed, and a stop rope for limiting the opening movement of said shutter.

6. A ventilator comprising a framing composed of upright posts and cross braces connecting the upper portions thereof, a roof covering said framing, a baseboard extending around the outside of the framing and connecting said posts at a distance above their lower ends, leaving the latter exposed, said baseboard being adapted to rest upon a supporting base surrounding a roof opening, a series of outwardly opening shutters each resting at its lower edge upon said baseboard and hinged thereto, and means for operating said shutters.

7. A ventilator comprising a framing having upright corner posts and cross braces connecting the upper portions thereof, a roof covering said framing, a base board surrounding said framing near the lower ends of said posts, a series of shutters each hinged at its lower edge to said base board and adapted to swing outward from said framing, the vertical edges of adjacent shutters at the corners of the framing being beveled to meet on the outside of said corner posts when said shutters are closed, means for opening said shutters, and releasable means for holding the shutters against opening movement.

8. A ventilator comprising a framing composed of upright posts, cross braces connecting the upper portions thereof, a roof covering said framing, a base board extending around the framing and connecting said posts near their lower ends, said base board being rabbeted at the outer side of its upper edge, a series of shutters each having its lower edge located in said rabbet and hinged to the base board, said shutters being arranged to swing outward from the framing, and means for opening and closing said shutters.

9. In a ventilator, the combination with a framing of a series of outwardly-opening shutters carried thereby and hinged thereto at their lower edges, releasable means for holding said shutters against opening movement, and means for automatically opening said shutters independently of one another, when released.

10. In a ventilator, the combination of a framing, a series of shutters carried thereby, means for opening said shutters independently of each other, means for holding said shutters against opening movement comprising ropes secured to the shutters respectively, automatic releasing devices adapted to detachably receive said ropes, and means for simultaneously operating said releasing devices from a plurality of different points.

11. In a ventilator, the combination of a framing, a series of shutters carried there-

by, means for opening said shutters independently of each other, and means for holding said shutters against opening movement comprising a series of electrically-operated releasing devices included in a common electric circuit, a rope leading from each shutter to one of said releasing devices and detachably secured to the latter, and means for controlling said electric circuit at a plurality of different points.

12. In a ventilator, the combination of a framing, a shutter carried thereby, means for opening said shutter, means for holding

said shutter against opening movement comprising a rope secured thereto and a releasing device adapted to detachably receive said rope, and a fusible link included in said rope and normally sustaining the tension thereon.

In testimony whereof, I have hereunto subscribed my name this twentieth day of April, 1906.

EVERETT D. CHADWICK.

Witnesses:

JOSEPH T. BRENNAN,
CASPAR ROGERS.