

(No Model.)

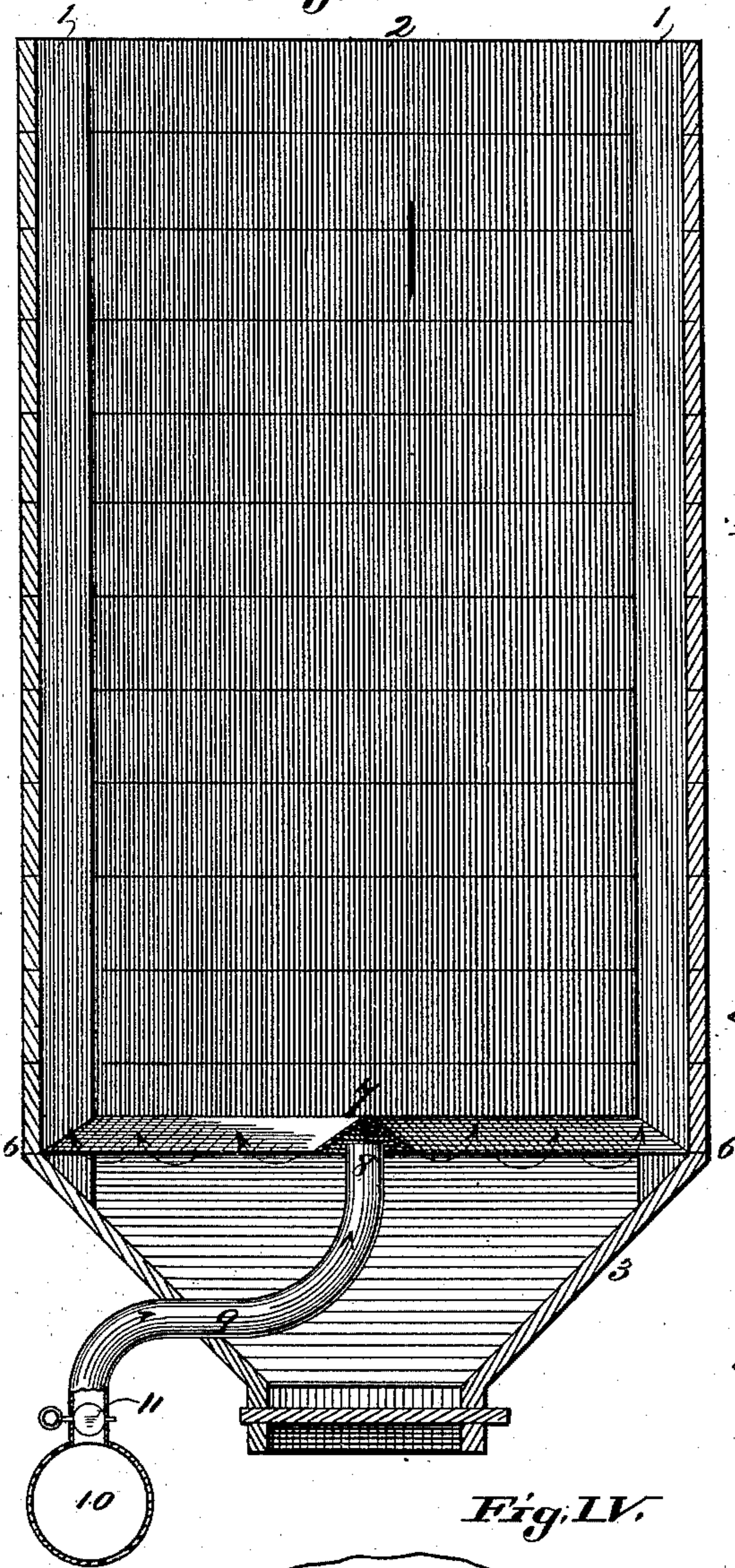
F. MORTON.

VENTILATING APPARATUS FOR GRAIN BINS.

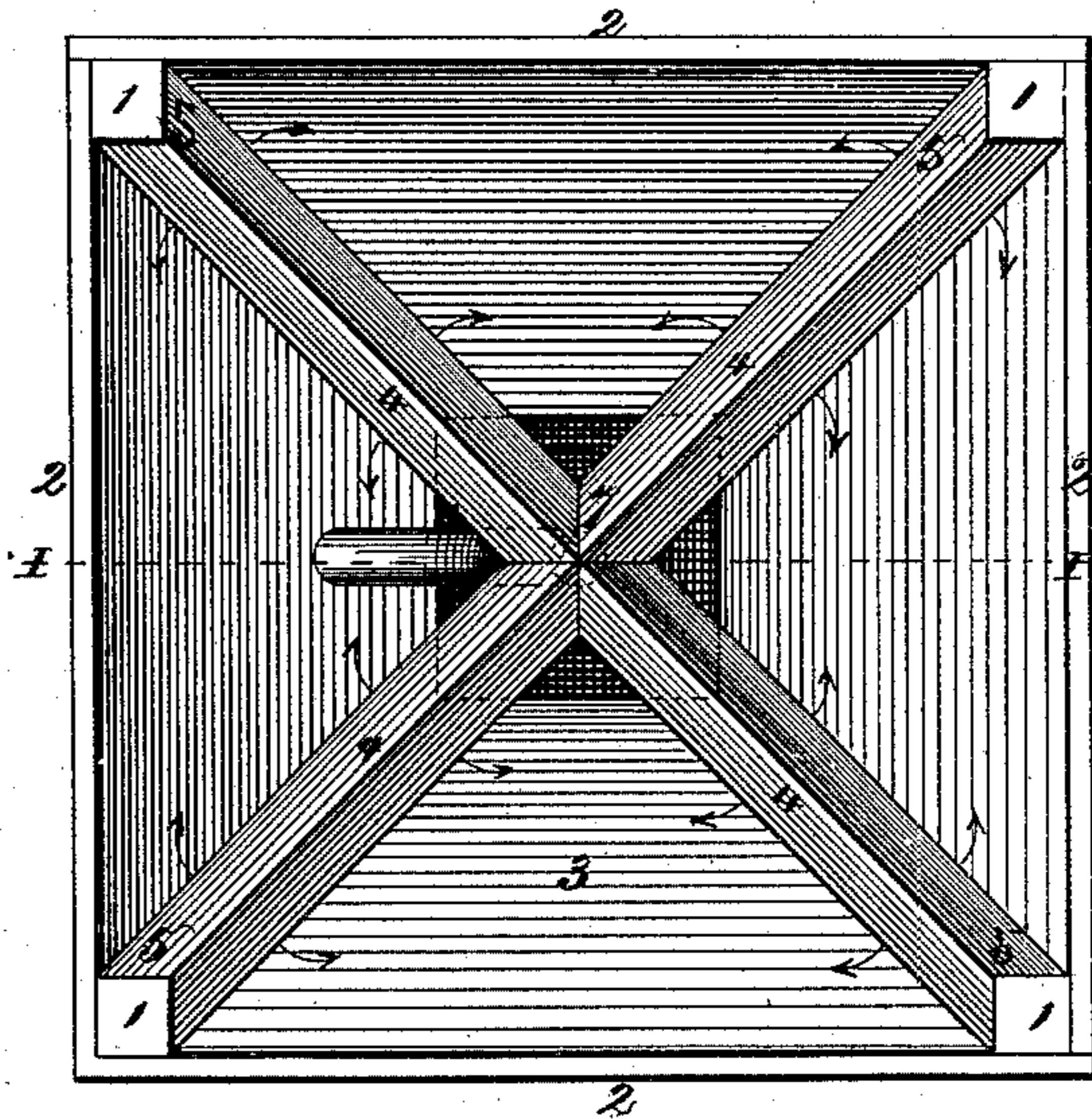
No. 474,676.

Patented May 10, 1892.

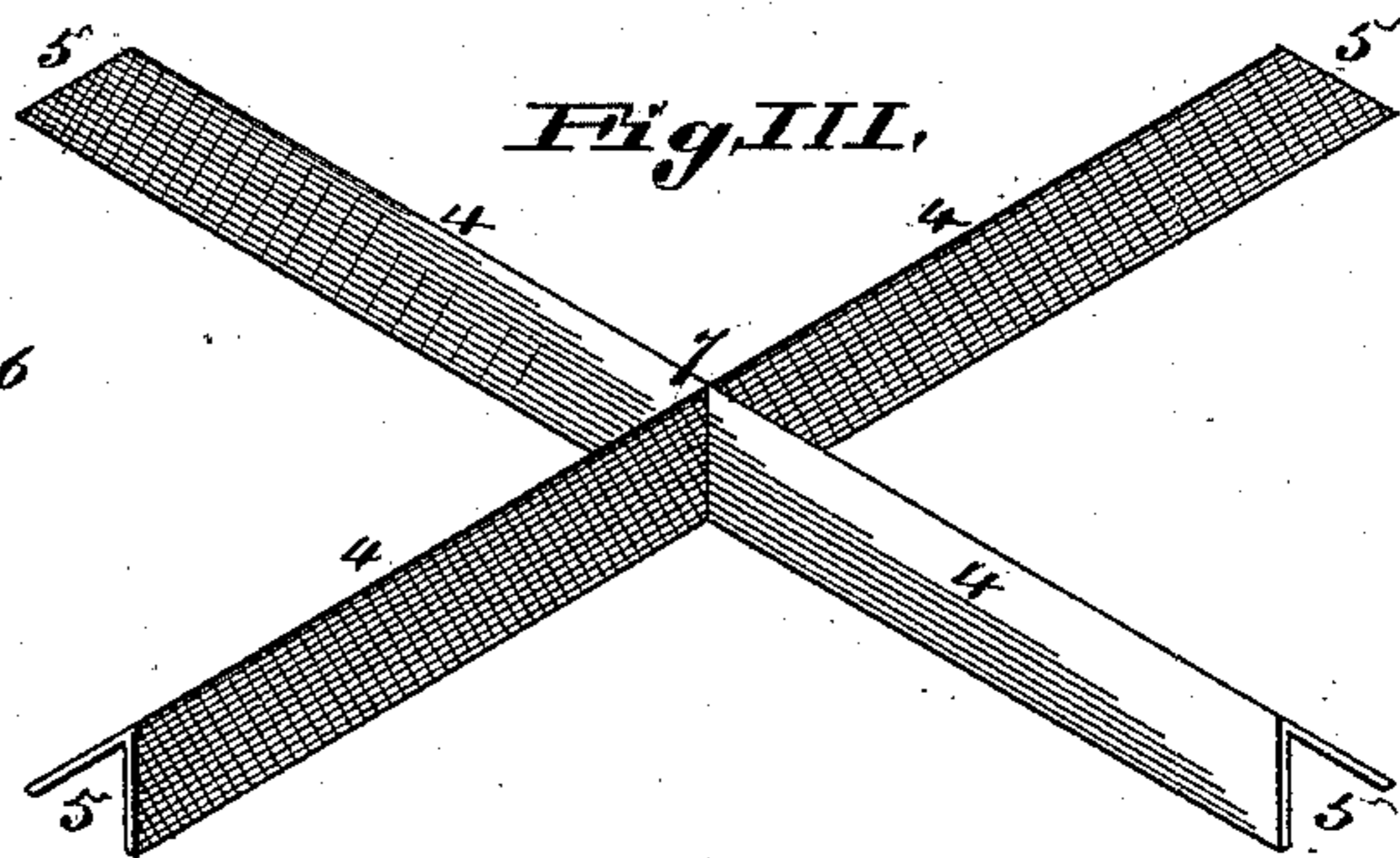
*Fig. I.*



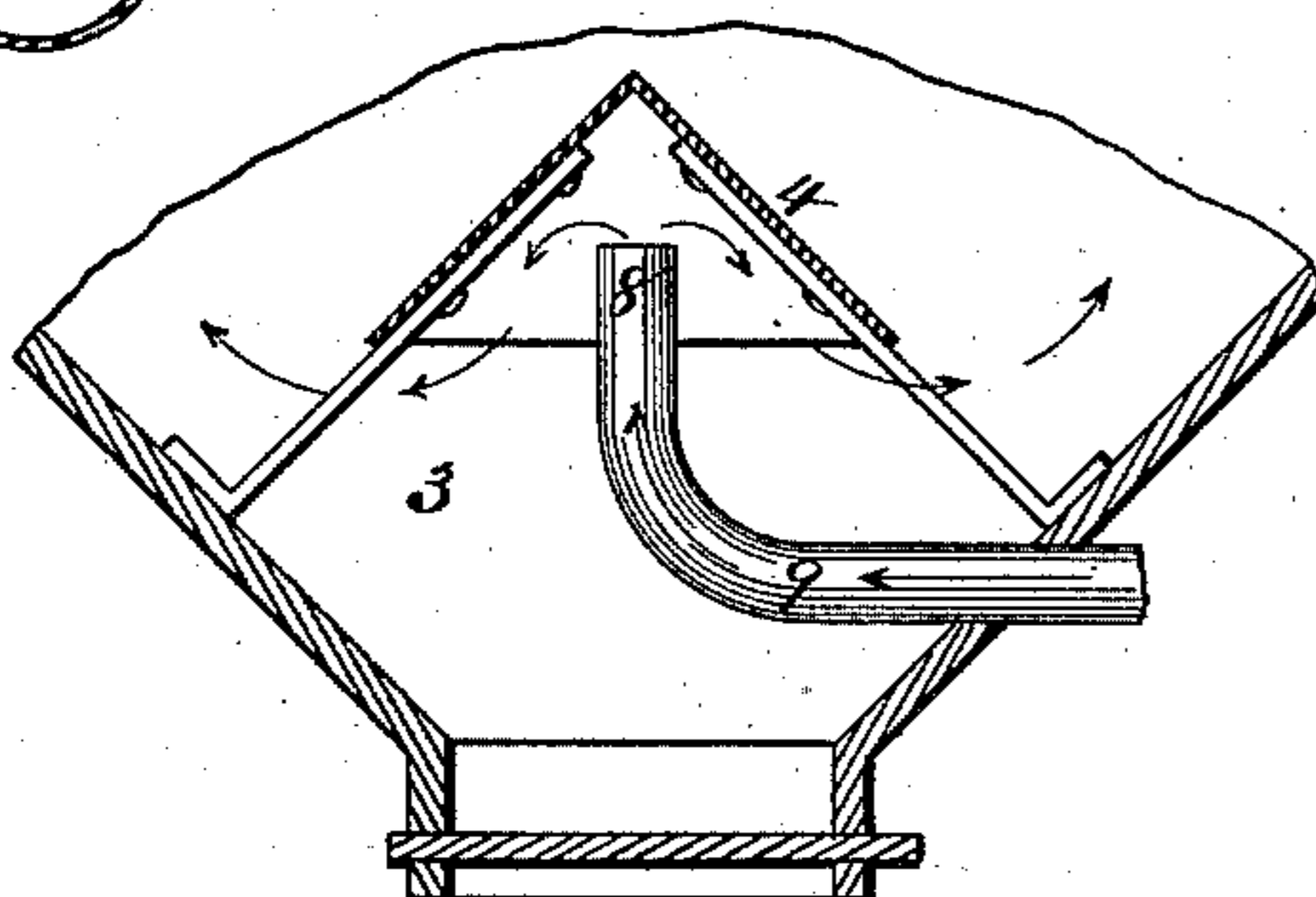
*Fig. II.*



*Fig. III.*

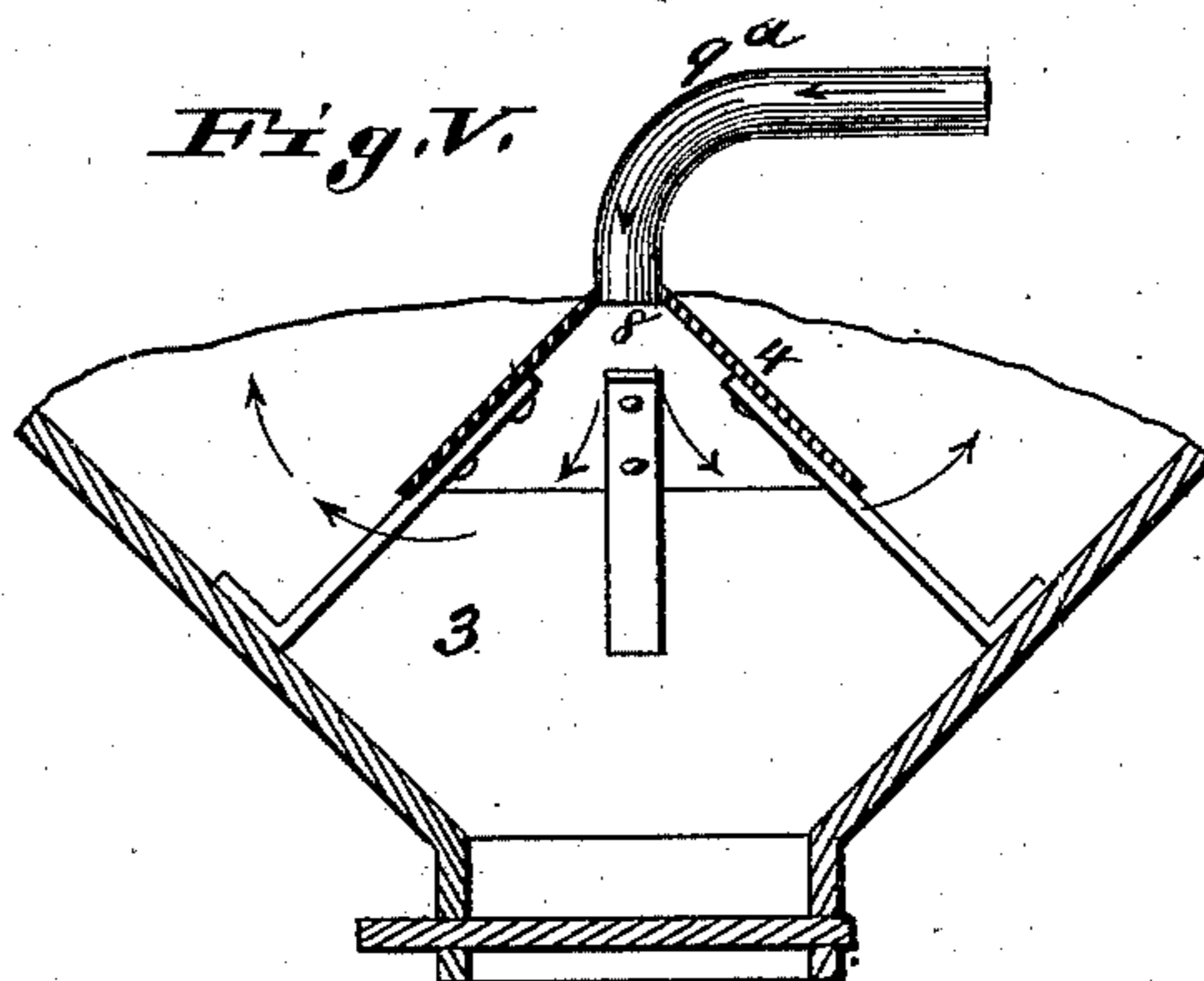


*Fig. IV.*



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*Fig. V.*



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# UNITED STATES PATENT OFFICE.

FRANK MORTON, OF ST. LOUIS, MISSOURI.

## VENTILATING APPARATUS FOR GRAIN-BINS.

SPECIFICATION forming part of Letters Patent No. 474,676, dated May 10, 1892.

Application filed April 23, 1890. Serial No. 349,150. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK MORTON, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Ventilating Apparatuses for Grain-Bins, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a ventilating appliance to elevator grain-bins of ordinary construction where the bins are built in a solid body with the division-walls common to the adjoining bins, so that there is no access to the sides of the bins, and where the bins are fifty feet, more or less, in height. These bins must be discharged at the bottom, so that no appliance materially interfering with such discharge is permissible. The weight per horizontal square foot on the bottom of a bin filled with wheat is over two thousand five hundred pounds, so that no weak appliance would sustain the pressure. In order to meet these various requirements, I have invented my ventilating appliance, which consists in a pipe or duct discharging a forced current of air through the exposed lower end of the bin and provision above the point of discharge of a receiver and equalizer hollow and open on the under side and having a substantially horizontal lower edge beneath which the air escapes equally at all parts and, passing through all portions of the grain, escapes at the top of the bin.

Figure I is a vertical section at I I, Fig. II. Fig. II is a top view of the empty bin. Fig. III is a perspective view of the inverted trough. Fig. IV is a detail vertical section showing the cup form of receiver and distributor, and Fig. V is a similar view showing the inverted funnel.

The grain-bin may have the ordinary construction, as shown, having corner stanchions 1, vertical sides or walls 2, and conical bottom 3.

The apparatus will be described in the order shown in the drawings—namely, first the form shown in Figs. I, II, and III, next that in Fig. IV, and then that in Fig. V.

4 are inverted-V-shaped troughs extending horizontally across the bin from corner to corner, where the four ends 5 of the troughs are

closed by the corner posts or stanchions 1, said troughs being closed at top throughout their length and forming channels or passages which intersect each other at the point 7, thus forming practically four troughs radiating from a common center. It is preferred that the troughs shall be level with the angle 6 between the vertical sides 2 and conical bottom 3, in order that the air shall be diffused through the largest amount of grain which may be feasible. Beneath the intersection 7 of the arms of the trough is the discharging end 8 of the air-pipe 9, which passes through the bottom 3 of the bin and is connected with an air-pipe 10, into which air is forced by any suitable fan or air-blower. 11 is a valve by which the pipe 9 may be partly or wholly closed. It will be understood that the air will escape into the grain all along the lower edges of the trough and will become diffused among the grain at all parts above the troughs, and even below the troughs, where the grain becomes heated, (at that point,) because the heated air would ascend and give place to the cooler air from the troughs. It will also be seen that if there should be a greater heat in one part of the bin than another part that the air would ascend more quickly from the former and the cooler air would flow in from the sides to take the place of the ascending warmer air.

The modification shown in Fig. IV has an inverted conical or pyramidal cup 4, which receives the air from the pipe 9, the air flowing out beneath the edge into the mass of grain.

The modification shown in Fig. V has a similar inverted cup; but the air-pipe 9<sup>a</sup> is in communication with the apex of the cup and may extend into the bin from the bottom or top.

I have shown the air receiver and distributor 4 in the form of an inverted trough and in that of an inverted cup. The trough is shown arranged in form of a cross—that is to say, the troughs radiate from each other, so as to form continuous troughs across the bin from side to side. It is obvious it may have any other arrangement that will enable it to perform the same functions.

There are two essential features in the air receiver and distributor: first, that it shall receive the air from the pipe and distribute

it widely among the grain, and, second, that it shall not interfere with the discharge of the grain from the bin. To insure the first, the receiver 4 is constructed to give a space  
 5 free from the grain for the reception and free circulation of the air, and the lower edge is on one level, so that the air escapes in about equal quantity from all parts. To insure the second, the receiver has no part upon which  
 10 a grain can lodge, so that every grain is dislodged when the bin is cleared. It may be found better to incline the lower edge of the trough 4 slightly upward from the receiving-point, (over the mouth 8 of the pipe 9,) so as  
 15 to favor the escape of the air from the parts more distant from the said point where the pressure would be less.

The compressed air supplied through pipe 9 may be cold or heated.

20 I claim as new and of my invention—

1. The combination, with a grain-bin, of an inverted air-receiver within the grain-bin having no means of discharge except beneath the lower edge, the said edge being substan-  
 25 tially horizontal, so that the air will escape from all parts of the edge, an air-conveyer

with a discharge-mouth beneath the receiver, and a blowing device connected to the said conveyer, substantially as and for the purpose set forth.

2. The combination, with a grain-bin, of an inverted trough within the grain-bin with a substantially horizontal edge, so as to insure an equal discharge of air beneath all parts of the edge, an air-conveyer with discharging-  
 35 mouth centrally beneath the inverted trough, a blowing device adapted to force air into the conveyer, and suitable means to regulate the amount of air passing through the conveyer.

3. The combination, with a grain-bin, of an  
 40 air-receiver within the bin having an inclined top with no orifice for escape of air and having a substantially horizontal lower edge, so that the air shall escape equally beneath all parts of the edge, an air-conveyer discharging be-  
 45 neath the receiver, and a blower connected with the air-conveyer, substantially as and for the purpose set forth.

FRANK MORTON.

In presence of—

SAML. KNIGHT,  
 ALBERT M. EBERSOLE.