

No. 689,597.

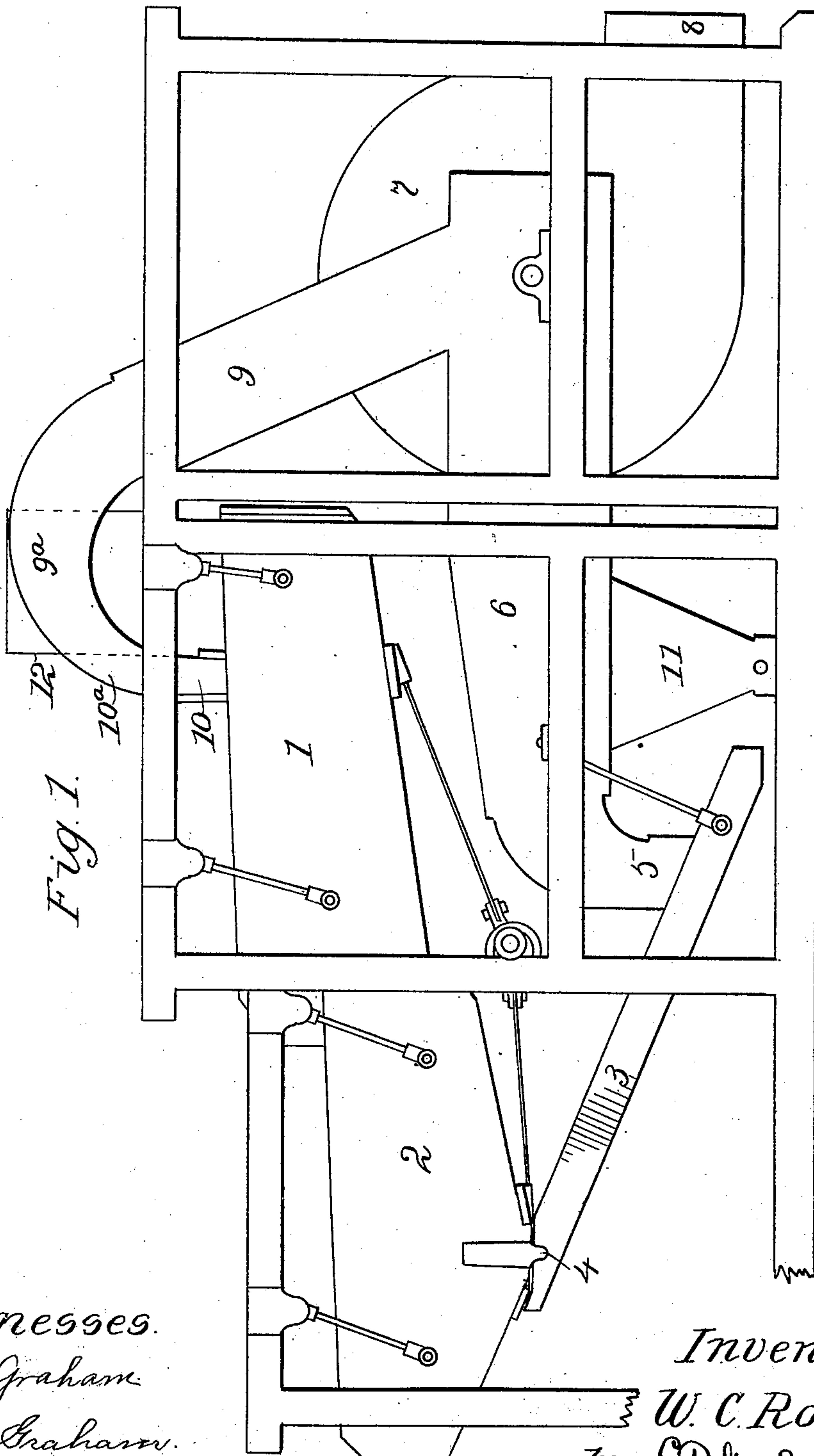
Patented Dec. 24, 1901.

W. C. ROWE.  
GRAIN CLEANER.

(Application filed July 3, 1900.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses.  
Ana Graham  
Nora Graham.

Inventor,  
W. C. Rowe  
by L. P. Graham  
his attorney

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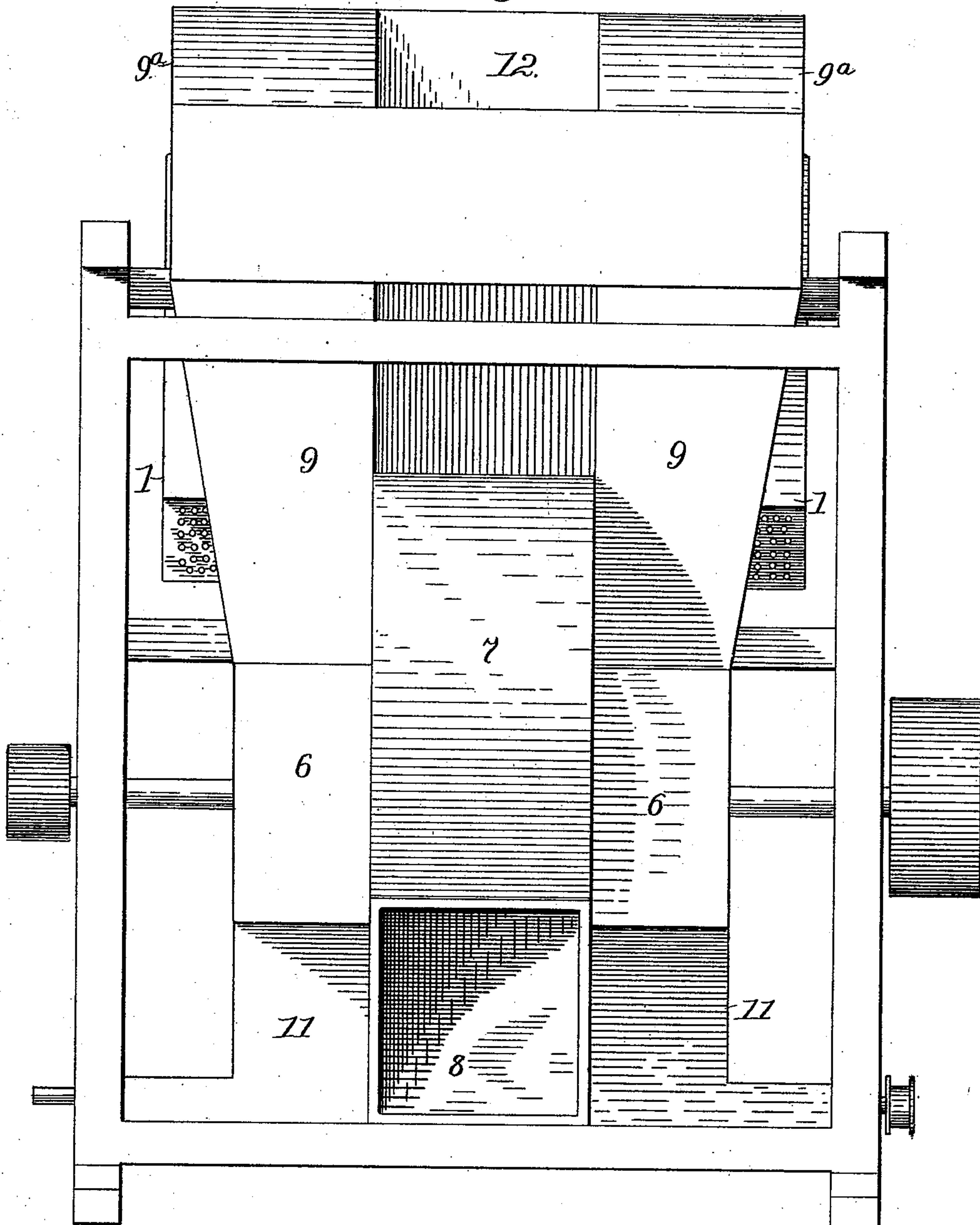
**W. C. ROWE.**  
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**4 Sheets—Sheet 2.**

Fig. 2.



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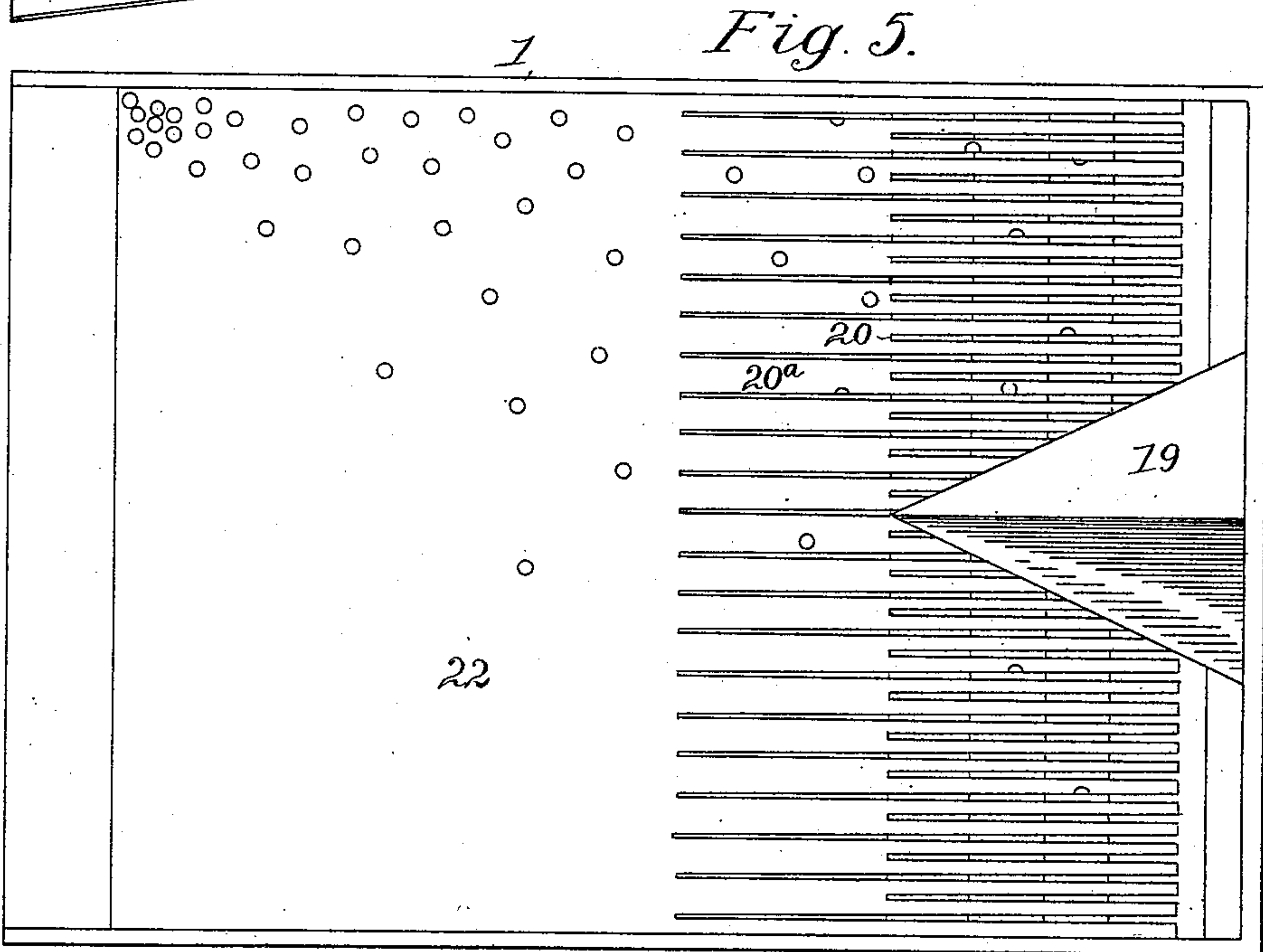
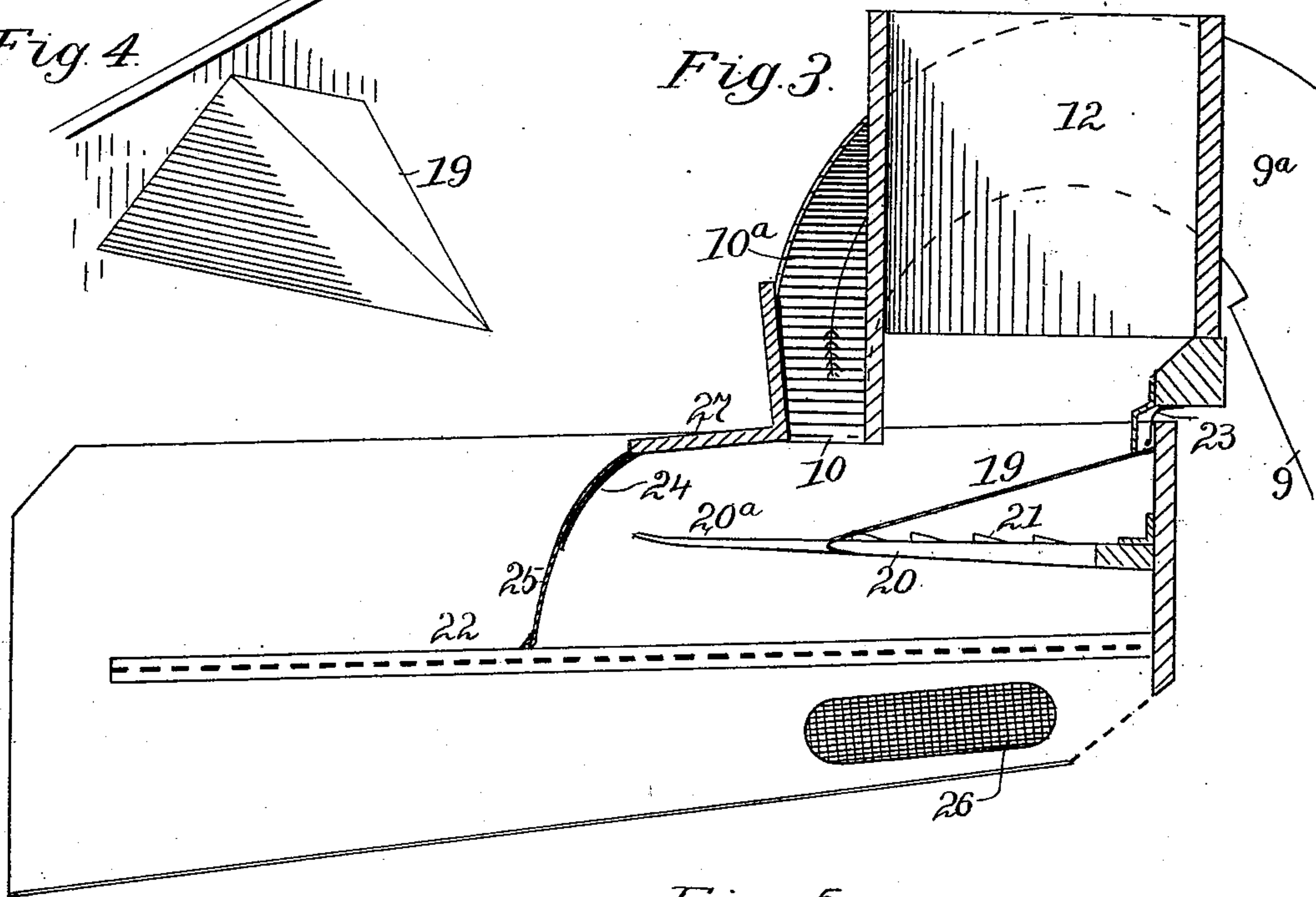
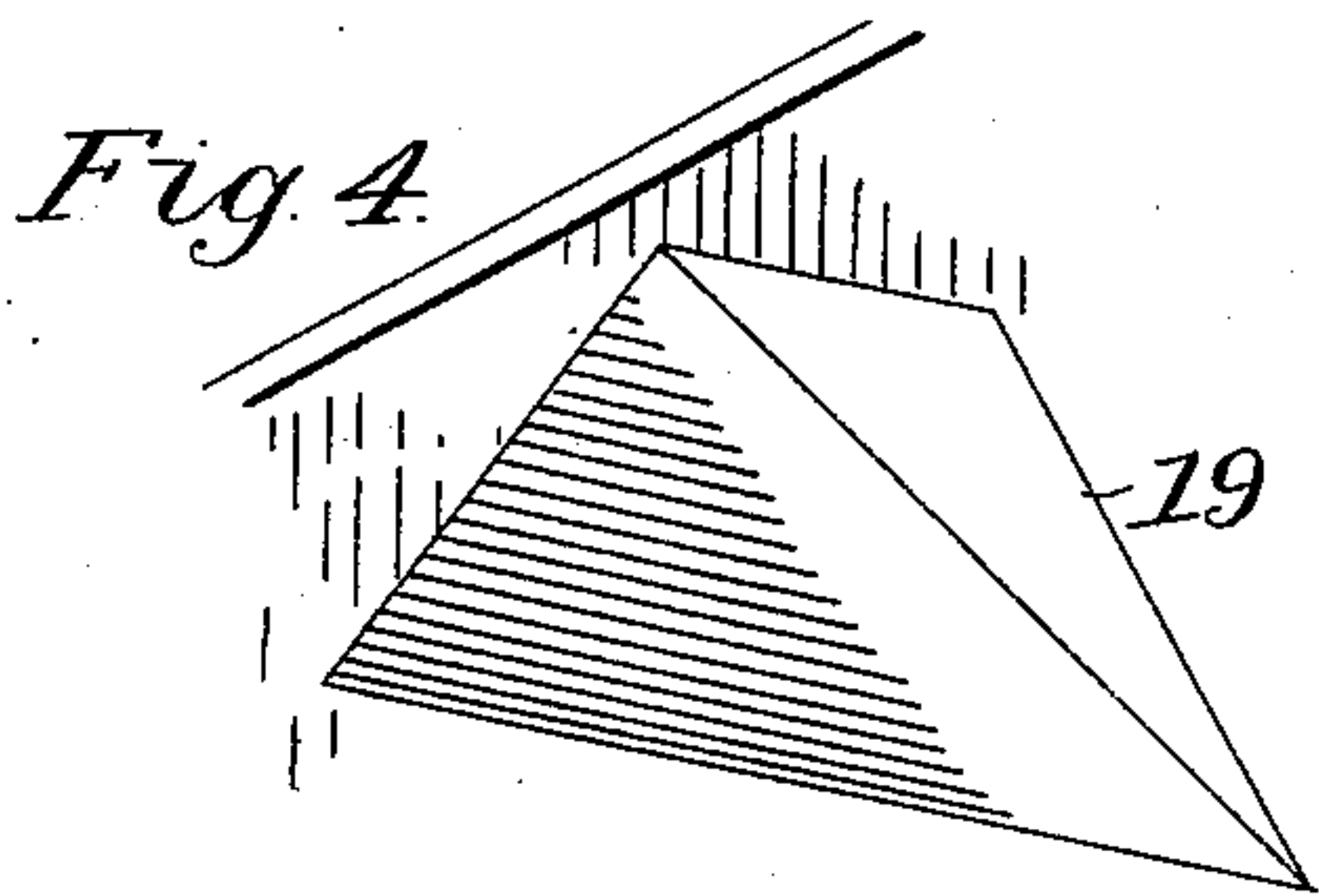
**Patented Dec. 24, 1901.**

**W. C. ROWE.**  
**GRAIN CLEANER.**

(Application filed July 8, 1900.)

(No Model.)

**4 Sheets—Sheet 3.**



Witnesses.  
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No. 689,597.

Patented Dec. 24, 1901.

W. C. ROWE.  
GRAIN CLEANER.

(Application filed July 3, 1900.)

(No Model.)

4 Sheets—Sheet 4.

Fig. 6.

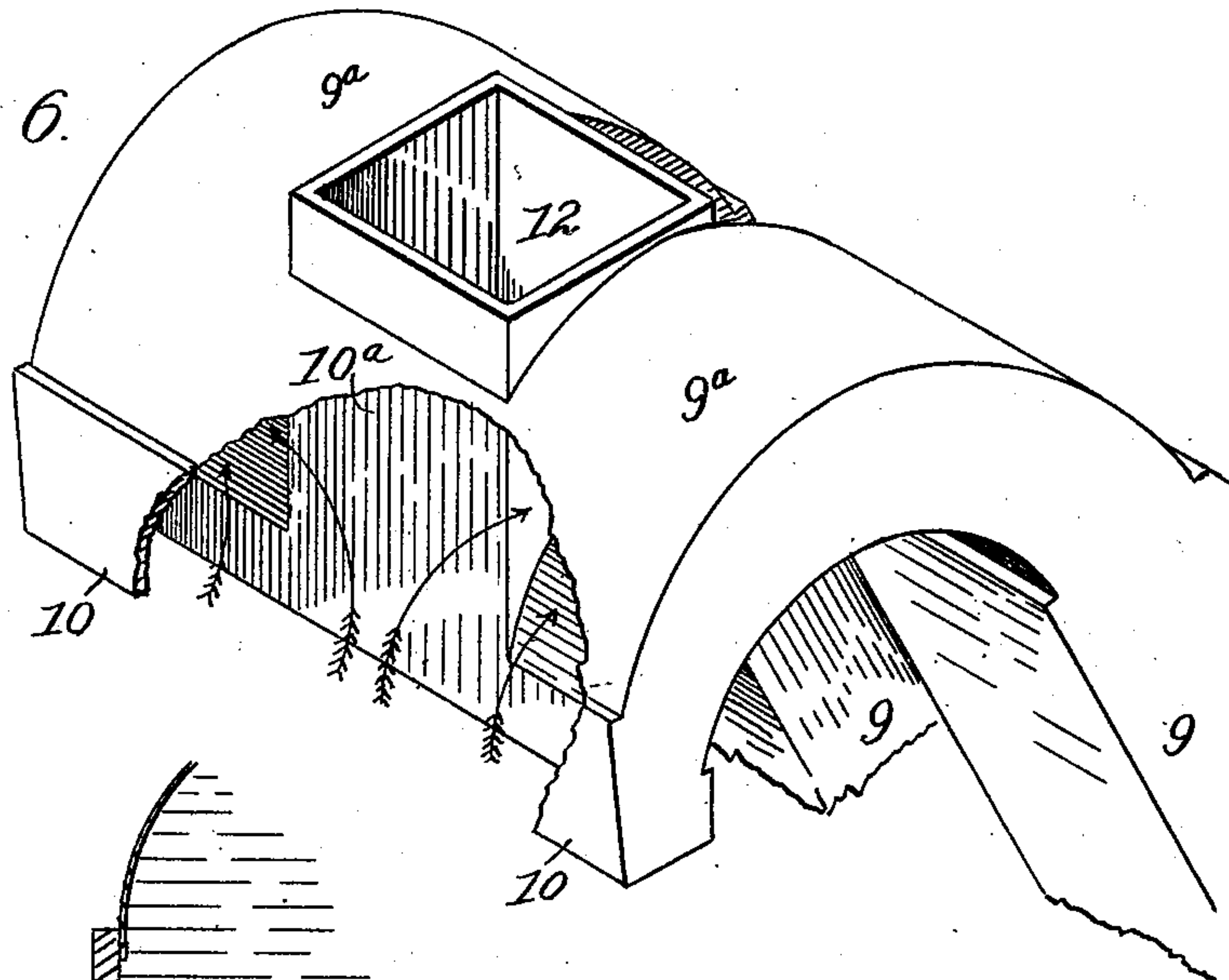
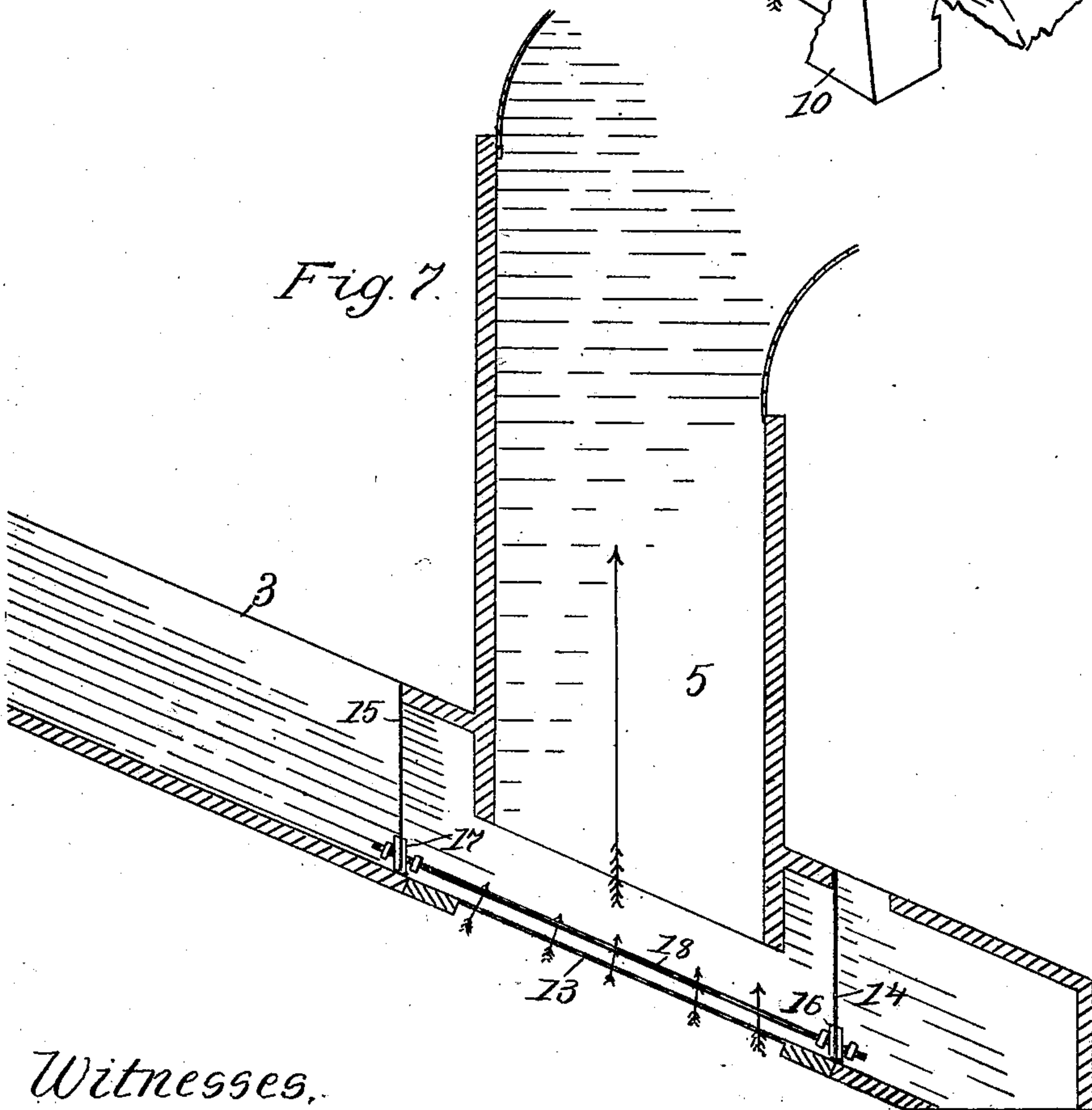


Fig. 7.



Witnesses,  
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his attorney



# UNITED STATES PATENT OFFICE.

WILLARD C. ROWE, OF DECATUR, ILLINOIS, ASSIGNOR TO UNION IRON WORKS, INCORPORATED, OF DECATUR, ILLINOIS.

## GRAIN-CLEANER.

SPECIFICATION forming part of Letters Patent No. 689,597, dated December 24, 1901.

Application filed July 3, 1900. Serial No. 22,404. (No model.)

*To all whom it may concern:*

Be it known that I, WILLARD C. ROWE, of the city of Decatur, county of Macon, and State of Illinois, have invented an Improved Grain-Cleaner, of which the following is a specification.

This invention is particularly designed to clean shelled corn, though it is applicable to other purposes. It is exemplified in the structure hereinafter described, and it is defined in the appended claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of a cleaner embodying my improvements. Fig. 2 is a rear elevation of the leading features of the cleaner. Fig. 3 is a central vertical section lengthwise through the primary riddle and the feed-hopper. Fig. 4 is a detail in perspective of the spreader for the screen. Fig. 5 is a plan of the primary screen, showing the arrangement of separating-fingers therein. Fig. 6 is a detail in perspective of the suction-trunk for the screen. Fig. 7 is a vertical section lengthwise of the machine, cutting the down-leg of the lower suction and the chute down which the grain travels past the mouth of the suction-pipe.

A primary screen-frame is shown at 1, at 2 is shown a secondary screen-frame, and at 3 is shown the discharge-chute of the secondary screen-frame. The discharge-chute 3 is pivotally connected with secondary screen-frame at 4, and the screen-frames and the discharge-chute are swung from the frame on pendulous hangers and vibrated by eccentrics in the customary manner. A suction-fan is shown at 7 and the discharge thereof at 8.

At 6 are shown air-trunks communicating with the suction-fan and leading to the down-leg 5, which terminates above the bottom of chute 3.

At 9 are shown air-pipes which branch off from trunks 6 and extend obliquely upward and forward. The upper ends 9<sup>a</sup> of pipes 9 curve forward astride the feed-hopper 12 and then turn downward and communicate with an air-trunk 10<sup>a</sup>, which traverses the screen in front of the hopper and has a downward-presented mouth 10.

The primary screen-frame 1 has a screen 22

of any suitable construction, and above the screen a set of fingers 20 extend forward from the rear end of the screen-frame. Each alternate finger of the set terminates in approximate vertical alinement with the transverse center of the mouth 10 of the top suction, and the others extend forward, as shown at 20<sup>a</sup>, and curve slightly upward at their ends. A triangular spreader 19 is placed at the center of the rear end of screen 1, with one of its sides resting against the end of the screen-frame and its apex terminating at or near the ends of the central teeth 20. The spreader is ridged from its apex backward to the center of the side that bears against the end of the screen-frame, which is its highest point, and it inclines forward and to both sides of the center of the screen. The hopper 12 is above the spreader and behind the suction-trunk 10<sup>a</sup>, the spreader rests on the fingers 20, and the fingers are above the screen 22.

Shelled corn, cobs, silks, pieces of husks and the like are delivered to the cleaner through hopper 12 and fall onto the spreader 19. The inclined surfaces of the spreader convey the corn, cobs, &c., sidewise and distribute them over the entire surface of fingers 20. The fingers are toothed or notched, as shown at 21 in Fig. 3, and as the screen-frame is vibrated the corn passes through the space between fingers, while the cobs, silks, husks, &c., are carried forward and under the mouth 10 of the top suction. When the ends of the short fingers are reached, the light material that is entirely separated from the unbroken cobs is caught by the suction and carried off through trunk 10<sup>a</sup>, while detached cobs fall through the spaces between extensions 20<sup>a</sup>. Cobs, silks, and husks that are matted together are retained on the smooth surfaces of the slightly-upturned extensions 20<sup>a</sup> of fingers 20 until the jar of the vibrating screen effects a separation, when the whole cobs fall through the spaces between fingers and the lighter material is drawn up by the top suction.

The trunk 10<sup>a</sup> extends across the screen-frame and rises in front of the hopper. The pipes 9 communicate with the ends of the trunk above the mouth thereof, and so the



suction is distributed uniformly across the mouth of the trunk, as suggested by arrows in Fig. 6.

After the preliminary separation is effected in the primary screen, as hereinbefore described, the corn, cobs, and whatever extraneous material may have escaped the top suction pass through the screens, the cobs are separated from the corn, and the corn, together with whatever foreign substances or impurities it may still be associated with, travels down the chute 3 and passes under the down-leg 5 of the suction-fan. A screen 13, preferably of wire, is set into the bottom of chute 3 under the mouth of down-leg 5. Curtains 14 and 15 are swung from the down-leg across the chute, one below and the other above the mouth of the down-leg. Strips 16 and 17 are fastened to the lower edges of the curtains, and a rod or rods 18 connect the swinging edges of the curtains and prevent one from swinging independent of the other. The lower suction gets air through the perforated bottom 13, and it tends to draw the curtains inward. The action of the suction on one of the curtains is equal to its action on the other curtain, but in a contrary direction, and the struts 18 cause one action to neutralize the other and leave the curtains hanging entirely unaffected by the suction of the fan. As the corn travels in a thin stream down the chute the curtains swing downward enough to permit the passage of the corn and then lie on the stream sufficiently close to prevent material passage of air. This necessitates the passage of air through the perforate bottom section 13 and through the grain traveling over such section, and whatever dust and foreign substances that may be traveling with the grain are caught up by the suction and carried off through down-leg 5.

Between the screens and the bottoms of the screen-frames a practically-closed chute for the grain is formed, and the space above the screen 22, in which the fingers act, is closed at one end by a curtain 23 and at the other end by a curtain 25. The upper part of curtain 25 rests on fingers or rods 24, that extend downward from plate 27, and its lower end rests on screen 22. This necessitates provision for a supply of air to feed the top suction and clean the material on the fingers, and such provision preferably consists of openings 26 in the sides of the screen-frame. This arrangement compels the passage of air upward through the screen in a properly-distributed manner, and its subsequent action on the material supported on the fingers has already been explained. The rods 24 hold the curtain 25 away from the ends of fingers 20<sup>a</sup> and support it so that it may yield to an unusual thrust and move away from the ends of the fingers to accommodate discharge therefrom.

I claim—

1. In a grain-cleaner, the combination of a vibratory frame, a set of fingers extending

lengthwise of the frame from the receiving end thereof and an inclined spreader over the fingers at the central part of the receiving end of the frame, substantially as specified. 70

2. In a grain-cleaner, the combination of a vibratory frame a set of fingers extending lengthwise of the frame from the receiving end thereof and a triangular spreader over the fingers at the central part of the receiving end of the frame, such spreader having one of its apexes presented in the direction of the travel of the material on the fingers and being inclined in opposite directions from a central ridge, substantially as specified. 75 80

3. In a grain-cleaner, the combination of a vibratory frame, a set of fingers extending from the receiving end of the frame, each alternate finger of the set being extended beyond the intermediate ones, an inclined spreader over the fingers at the receiving part of the frame, such spreader terminating at or near the ends of the short fingers, and a suction-trunk above the fingers at or near the termination of the spreader, substantially as specified. 85 90

4. In a grain-cleaner, the combination of a vibratory frame, a hopper over the receiving part of the frame, a set of alternately long and short fingers under the hopper, an inclined spreader at the center of the space occupied by the short fingers and a suction-trunk above the termination of the short fingers, and in front of the hopper, substantially as specified. 95 100

5. In a grain-cleaner, the combination of a vibratory screen-frame, a hopper over the receiving part of the frame, a set of fingers in the frame below the hopper, a spreader on the fingers a suction-trunk above the fingers in front of the hopper, a screen in the frame below the fingers, curtains closing the space above the screen in which the fingers operate and air-inlets through the frame below the screen, substantially as specified. 105 110

6. In a grain-cleaner, the combination of a vibratory discharge-chute having a perforate bottom section, a suction-pipe having its mouth presented to the chute above the perforate section thereof and curtains on the sides of the pipe hanging into the chute, outside the perforate section, substantially as specified. 115

7. In a grain-cleaner, the combination of a discharge-chute having a perforate bottom section, a suction-pipe having its mouth presented to the chute above the perforate section thereof, curtains on the sides of the pipe hanging into the chute outside the perforate section and a stiff connection for the curtains, substantially as specified. 120 125

In testimony whereof I sign my name in the presence of two subscribing witnesses.

WILLARD C. ROWE.

Witnesses:

WILL. H. CAKE,  
T. B. EWING.