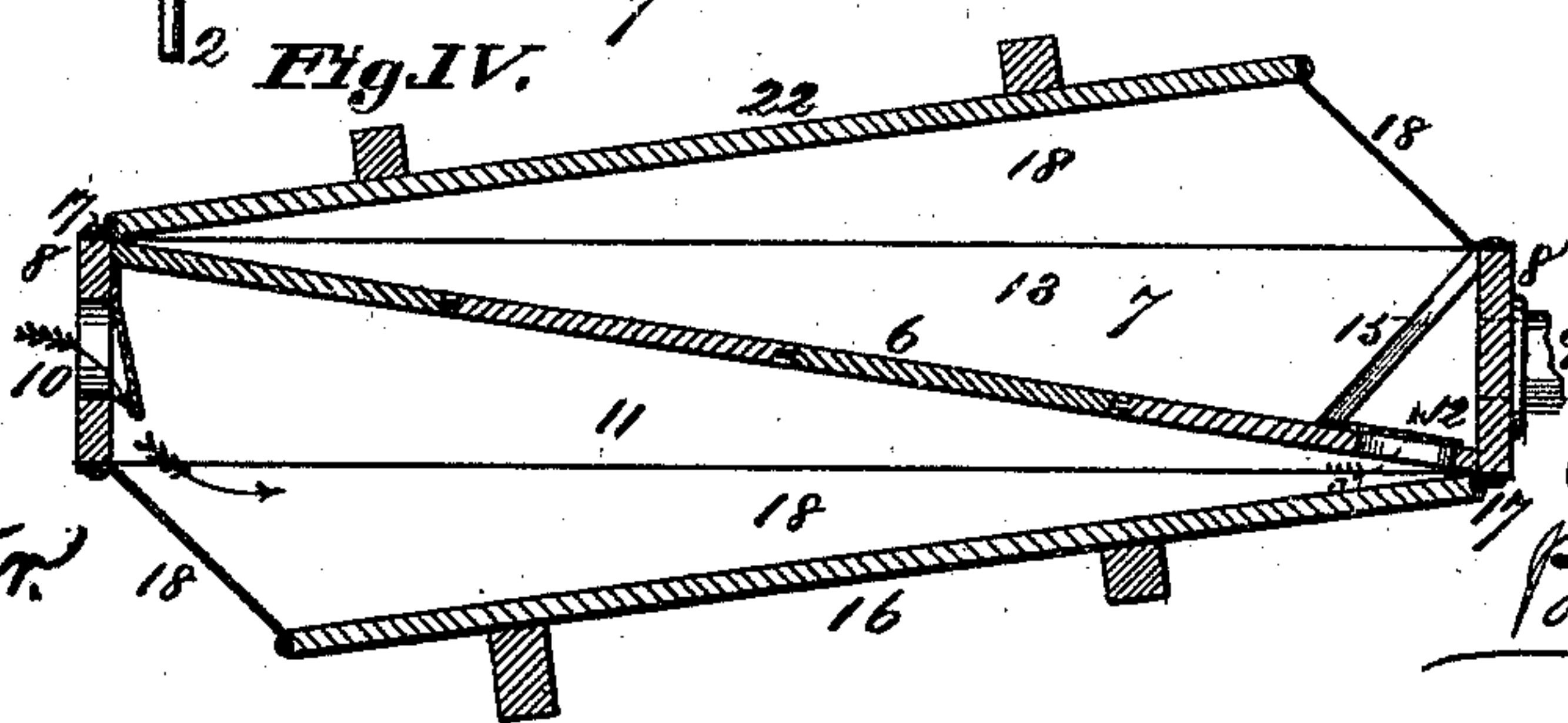
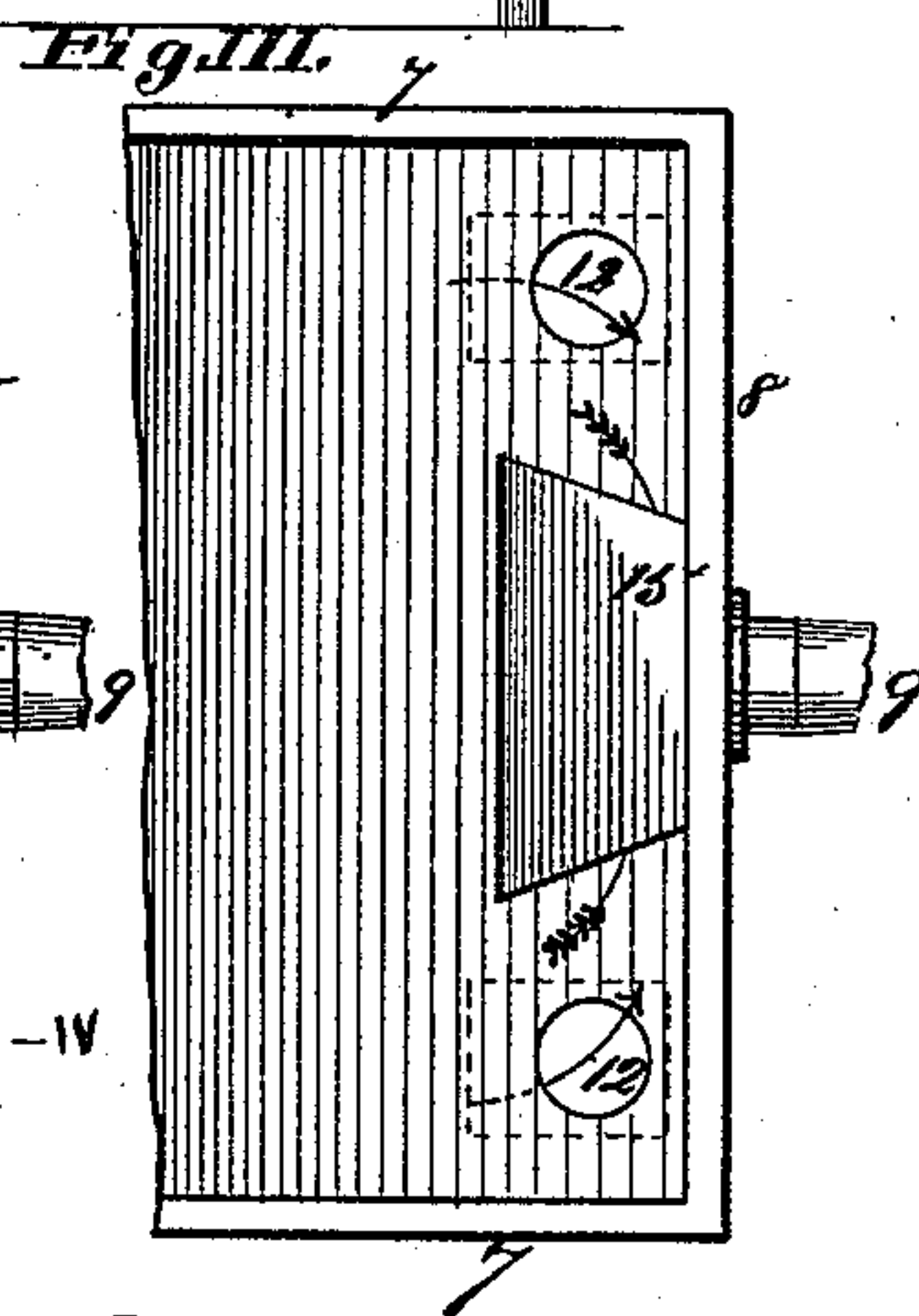
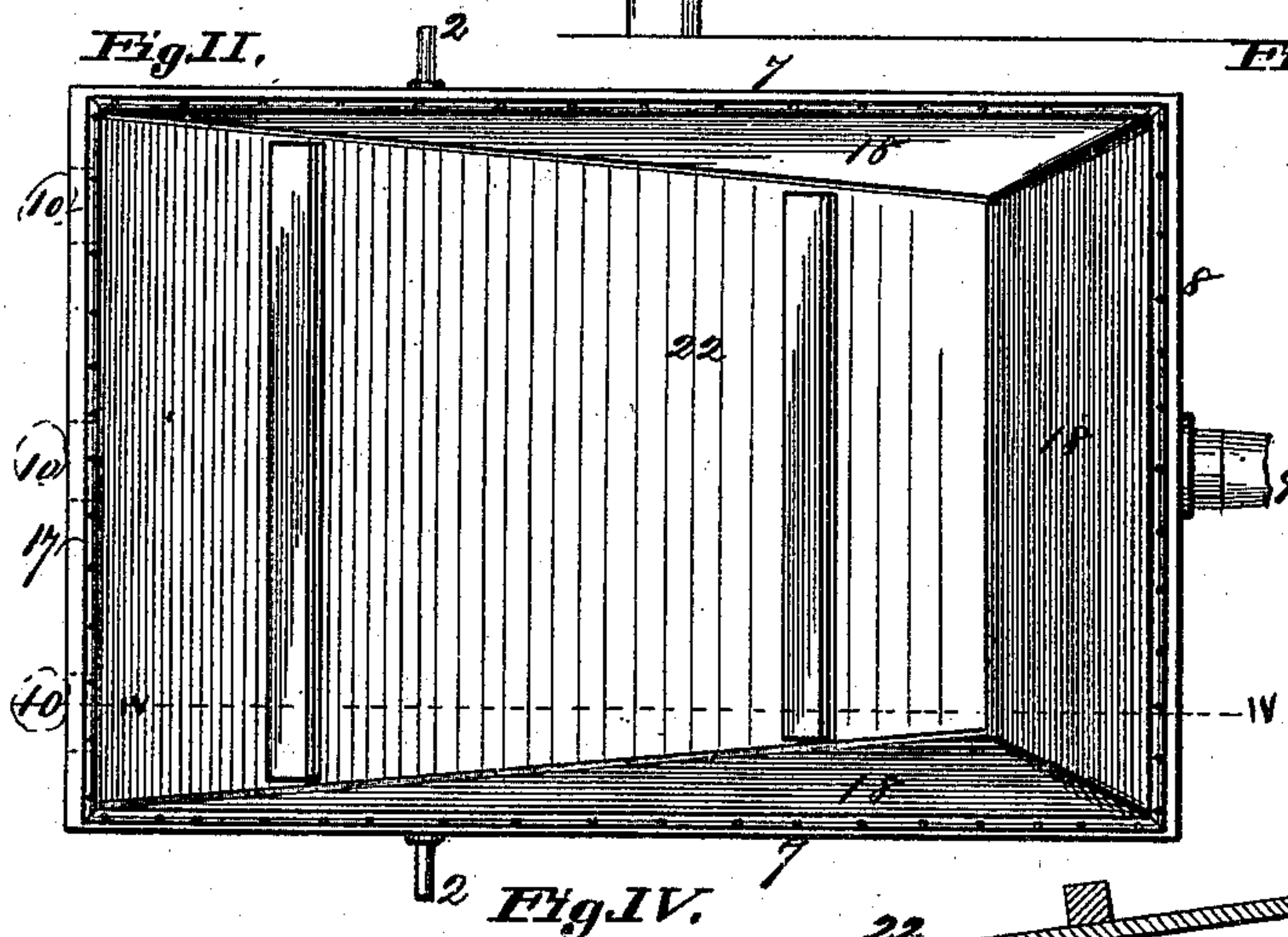
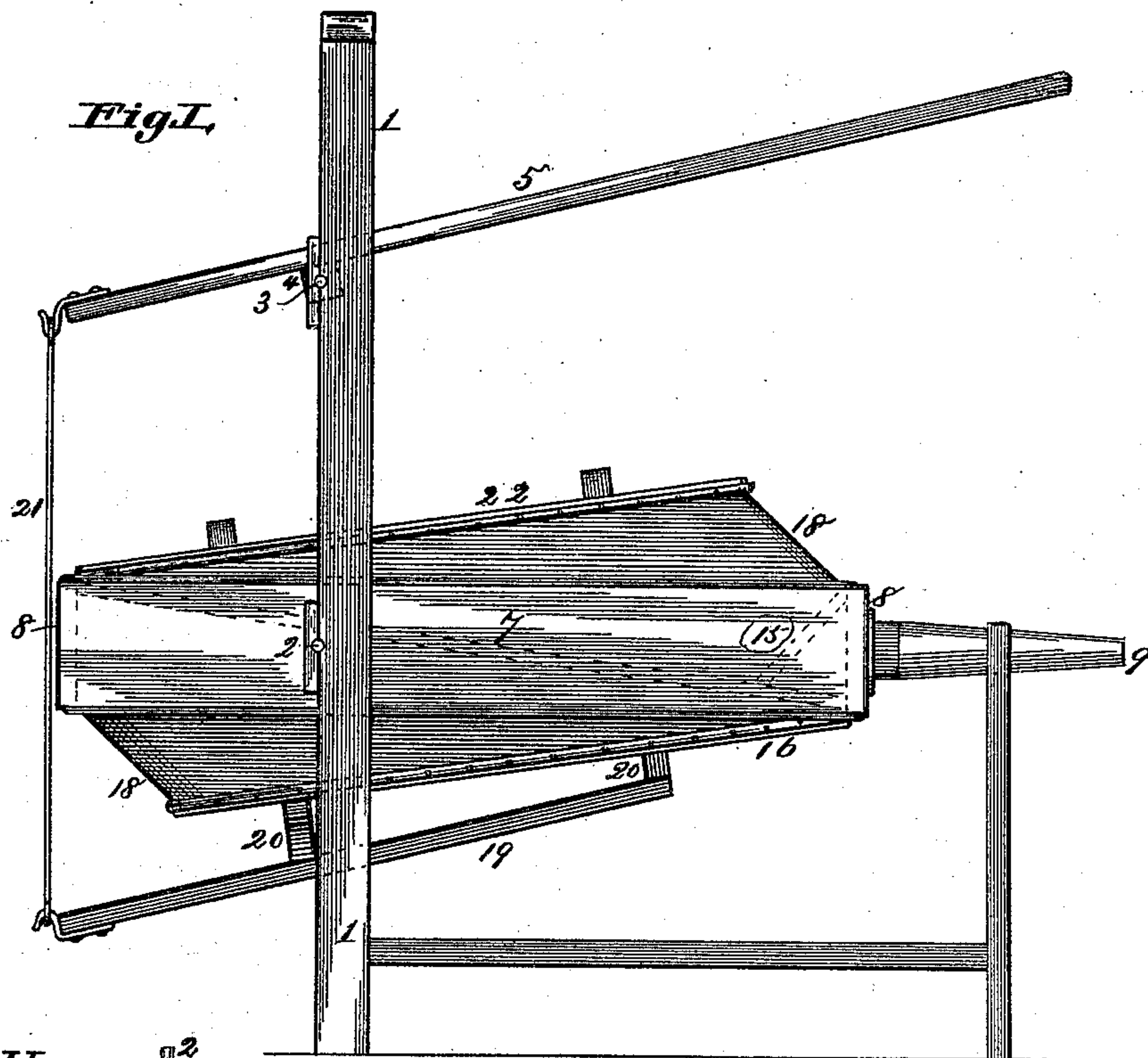


(No Model.)

F. CHRISTEN.  
BLACKSMITH'S BELLOWS.

No. 417,632.

Patented Dec. 17, 1889.



Attest:  
W. Knight,  
C. Arthur.

Inventor:  
Frank Christen,  
By W. Knight & Co.  
Attys.



# UNITED STATES PATENT OFFICE.

FRANK CHRISTEN, OF ST. LOUIS, MISSOURI.

## BLACKSMITH'S BELLOWS.

SPECIFICATION forming part of Letters Patent No. 417,632, dated December 17, 1889.

Application filed April 4, 1889. Serial No. 306,025. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK CHRISTEN, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Blacksmith's Bellows, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This bellows is of cheap, effective, and durable construction, consisting mostly of wood. The flexible part, which is reduced to a minimum, is composed of flat pieces of leather with straight edges, so that there is very  
15 small waste of material.

Figure I is a side elevation of the bellows. Fig. II is a top view. Fig. III is a detail top view, showing part of the partition and the deflector. Fig. IV is a longitudinal vertical  
20 section at IV IV, Fig. II.

The supporting-frame has usual uprights 1, giving bearing to the pins 2, fixed in the sides of the body of the bellows. The uprights also give bearing to the gudgeons 3 of the rock-shaft 4, to which the hand-lever 5  
25 is pivoted.

The body of the bellows is composed of a rectangular wooden box divided by an oblique partition 6. The box has sides 7 and  
30 ends 8. The front end contains the nozzle 9, and the rear end has the induction air-valves 10. (See Fig. IV.) The partition 6 extends obliquely from the lower edge of the front board 8 to the upper edge of the rear board  
35 8. The air from the lower chamber 11 passes through the upwardly-opening valves 12 in the front part of the partition into the upper chamber 13, from whence it passes through the nozzle to the fire. Behind the nozzle is  
40 an inclined deflector 15, whose office is to equalize to some degree the current of air passing out through the nozzle, and which acts to check the entrance of cinders or ashes into the body of the bellows when the bottom board is descending. The partition 6 is  
45 made of tongued and grooved boards, so that it may expand and contract without a tendency to buckle or to leak by the opening of the seams. The bottom board 16 is hinged

by a flexible strip 17 of leather to the front  
50 end board 8, and has an area less than the box composing the body, so that the bottom board may enter the lower chamber 11 and expel almost all the air therefrom. The bottom board is connected with the sides and  
55 rear end of the body by a flexible web 18 of leather.

19 is a bar secured to the bottom by brackets 20 in such a position that when the free end of the bar is in its upper position the  
60 bottom board is lifted into the chamber 11 almost or quite to the partition, forcing almost all the air from the chamber when in this position. The free end of the bar is  
65 connected by a rod 21 to the end of the hand-lever 5. The top board 22 is hinged to the top edge of the rear end bar 8 by a flexible strip 17, and has web-connection 18 with the side boards and front end board  
70 precisely like that described in relation to the bottom board, and the top board, like the bottom board, is of such a size as to be capable of entering the air-chamber and expelling almost all the air therefrom. The  
75 top board is weighted, as usual, to give the desired pressure to the air in the chambers 11 and 13.

I claim as my invention—

1. A bellows having top or bottom board connected to the side and end boards of the  
80 body by a flexible web 18 and constructed to enter the air-chamber of the body, substantially as set forth.

2. The combination, in a bellows, of the top and bottom boards hinged to opposite  
85 ends of the body and connected to the body by the strip 17 and flexible web 18, substantially as set forth.

3. The combination, in a bellows, of the oblique partition 6 and the top and bottom  
90 boards connected to the body by the flexible leather 18 and hinges 17 and having a smaller area than the body, all substantially as set forth.

4. The combination, in a bellows, of the  
95 body having upper and lower air-chambers, the top and bottom boards hinged to the opposite ends of the body and being smaller

than and adapted to enter said air-chambers, and the flexible webs 18, connecting said boards to said body, substantially as set forth.

5 5. The combination, in a bellows, of the rectangular body, the diagonal partition 6 in said body, and top and bottom boards hinged to the opposite ends of said body, substantially as and for the purposes set forth.

FRANK CHRISTEN.

Witnesses:

SAML. KNIGHT,

BENJN. A. KNIGHT.