

(No Model.)

2 Sheets—Sheet 1.

F. CHRISTEN.
BELLOWS.

No. 382,214.

Patented May 1, 1888.

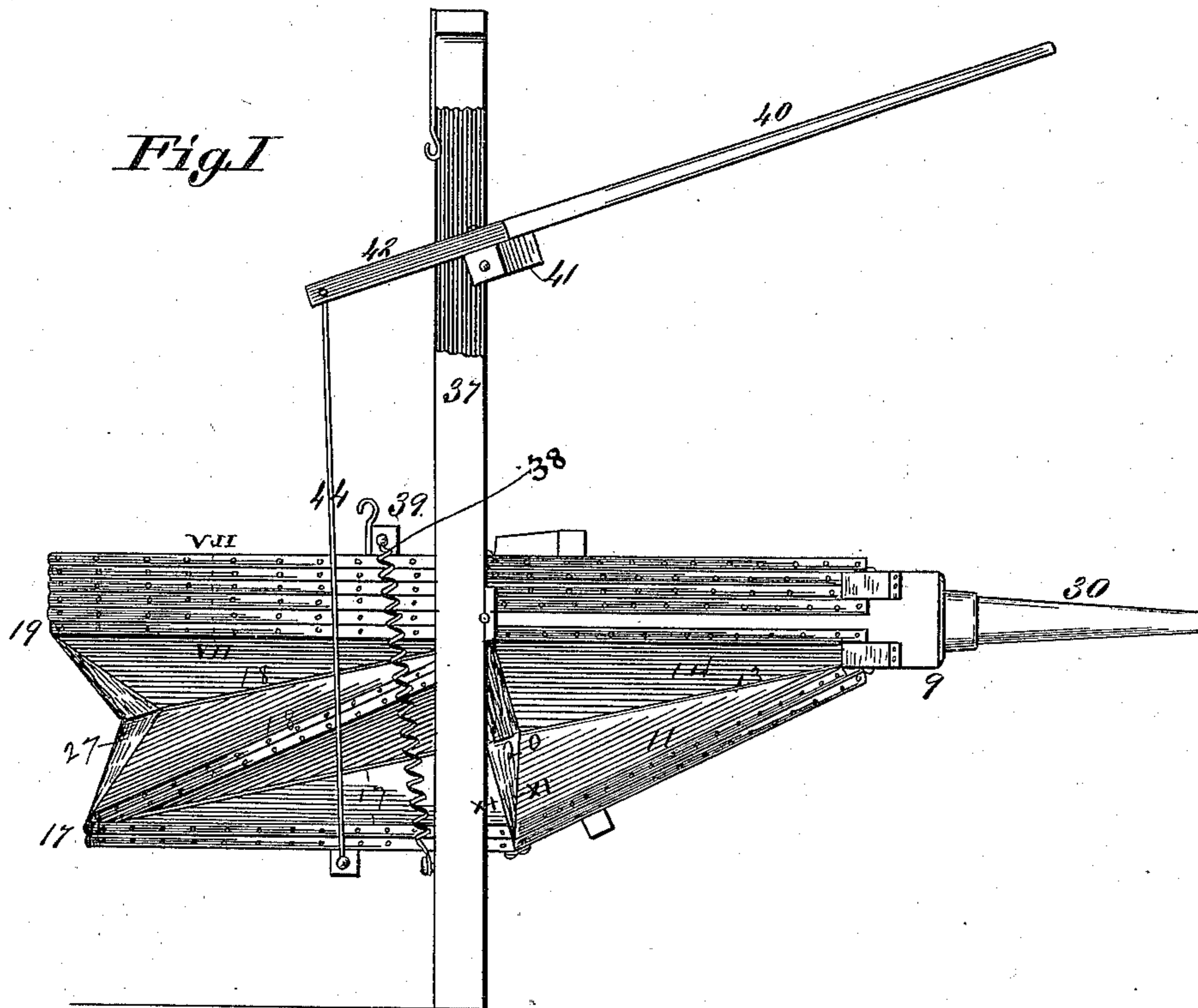
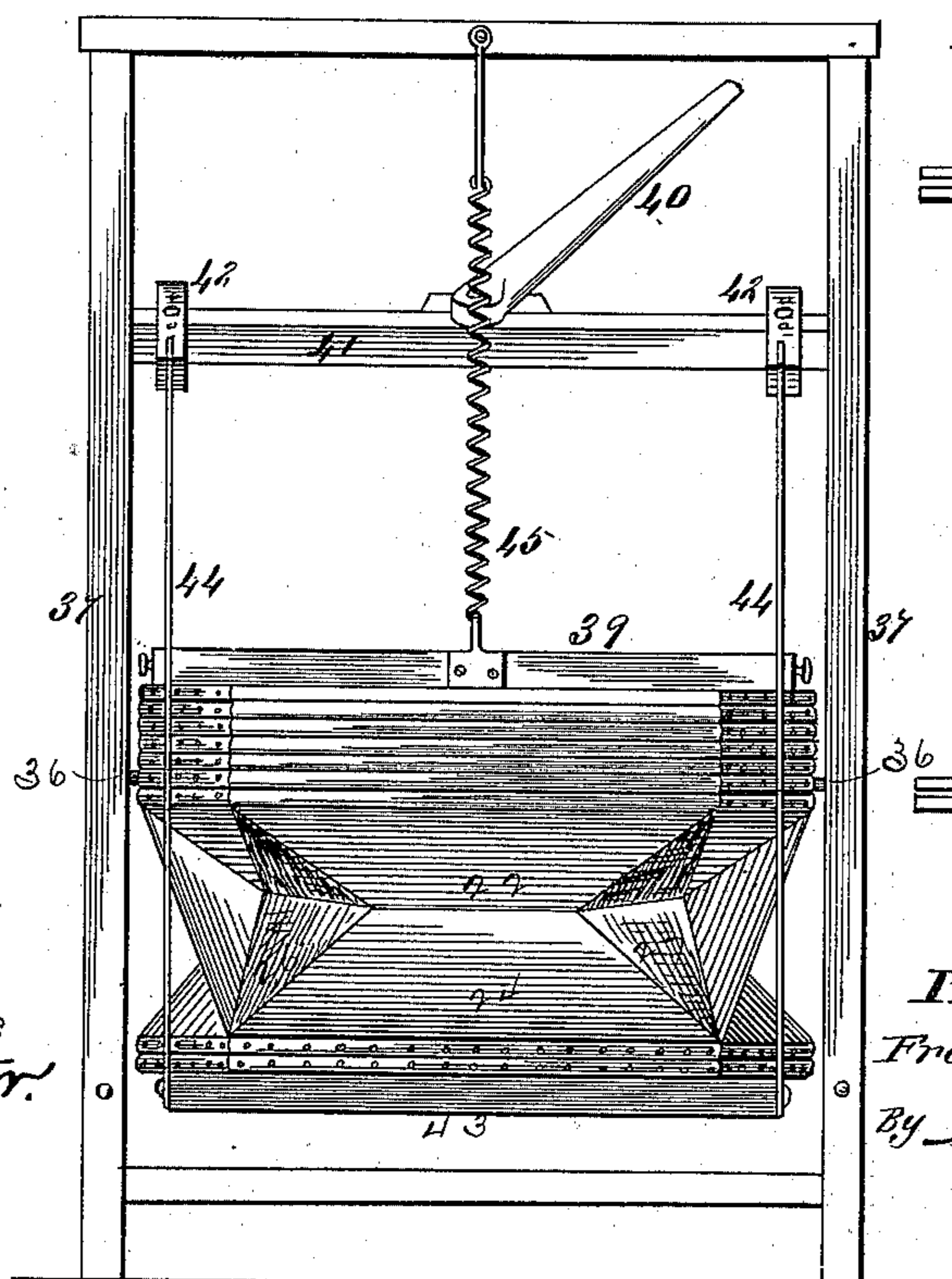
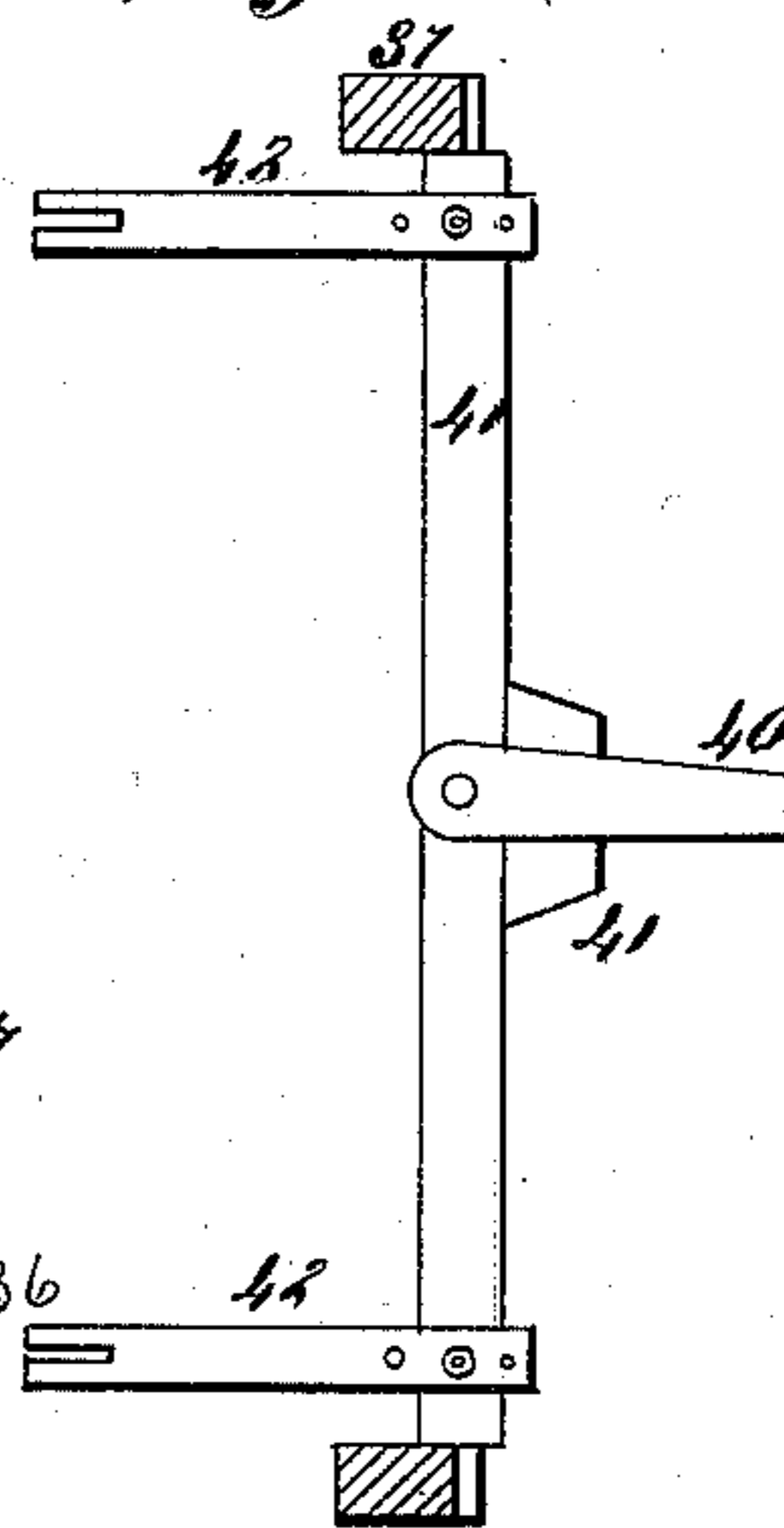


Fig. II.



Attest:
Charles Pickles
Emma Arthur.

Fig. III.

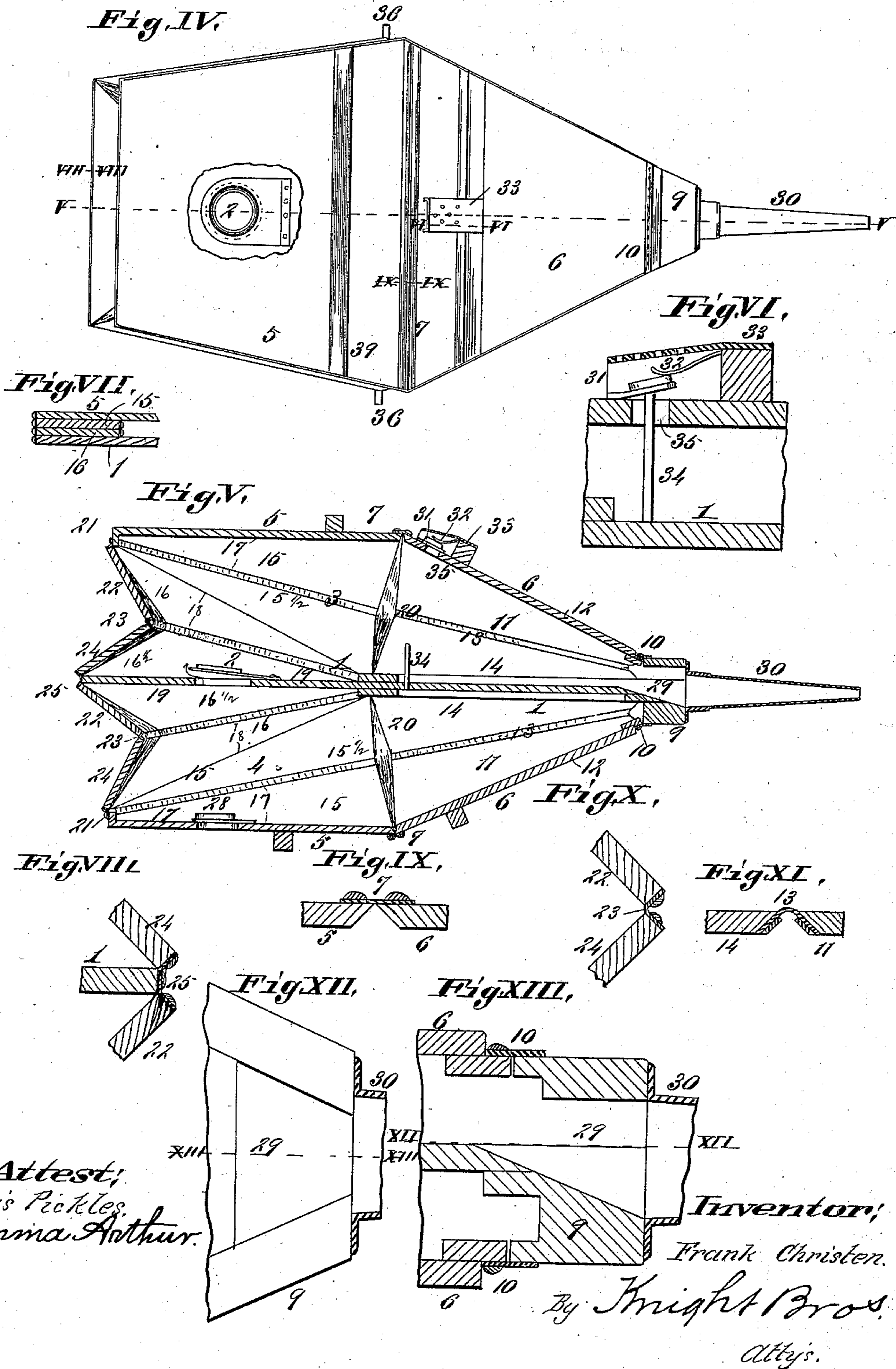


Inventor:
Frank Christen
By H. H. H. Bros
attys

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Attest;
Chas. Pickles,
Emma Arthur.

Inventor;

Frank Christen.

By Knight Bros.

Atty's.

UNITED STATES PATENT OFFICE.

FRANK CHRISTEN, OF ST. LOUIS, MISSOURI.

BELLOWS.

SPECIFICATION forming part of Letters Patent No. 382,214, dated May 1, 1888.

Application filed August 8, 1887. Serial No. 246,434. (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 Bellows, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure I is a side view of my improved bellows. Fig. II is a rear end view. Fig. III is a top view of part of the lever and the bar to which the lever is attached. Fig. IV is a top view, part broken away to show the valve in the center board. Fig. V is a vertical longitudinal section taken on line V V, Fig. IV. Fig. VI is an enlarged detail section taken on line VI VI, Fig. IV. Fig. VII is an enlarged detail section taken on line VII VII, Fig. I. Fig. VIII is an enlarged detail section taken on line VIII VIII, Fig. IV. Fig. IX is an enlarged detail section taken on line IX IX, Fig. IV. Fig. X is an enlarged detail section taken on line X X, Fig. I. Fig. XI is an enlarged detail section taken on line XI XI, Fig. I. Fig. XII is an enlarged detail section taken on line XII XII, Fig. XIII. Fig. XIII is an enlarged detail section taken on line XIII XIII, Fig. XII.

My invention relates to an improvement in bellows; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, 1 represents a middle horizontal board or strip, forming the division between the air-receiving chamber below and the reservoir above. This board has an upwardly-opening valve, 2, through which the air enters the reservoir 3 from the chamber 4. The top and bottom are of the same general construction, each having two boards, 5 6, connected by a transverse strip of leather or other suitable flexible material, 7. The front sections, 6, of the top and bottom boards are connected at their front ends to the nose 9 of the bellows by strips of leather, 10. This construction allows the top and bottom to assume a flat position in collapsing. The portions 6 of the top and bottom boards are jointed along their whole length upon each side to gore-shaped boards 11, the joint being made by a leather strip at 12, and the boards 11 are connected in like manner by leather

strips 13 to boards 14 of similar gore shape, and whose opposite edges are connected by leather strips to the edge of the middle board, 1. 55

The boards 11 and 14 are inclined inward from the outside and middle boards, so that the joints 13 move inward as the top descends or the bottom ascends, folding as shown in Fig. VII. 60

Between the sections 5 of the top and bottom boards, respectively, and the middle board, 1, are boards 15, 15½, 16, and 16½, which are joined together and to the boards 1 and 5 by leather strips 17, 18, and 19. The inner ends of the boards 15, 15½, 16, and 16½ and the boards 11 and 14 are connected to each other by diamond-shaped strips of leather, 20, (see Figs. I and V,) that allow the necessary movements of the inflexible boards in the expansion and collapse of the bellows. 70

To the rear ends of the sections 5 of the top and bottom boards are jointed by leather strips 21 boards 22, which in turn are jointed by leather strips 23 to similar boards, 24, the opposite sides of which are secured to the end of the middle board, 1, by leather joints 25. 75

26 27 are diamond-shaped pieces of leather, by which the beveled rear ends of the boards 15, 15½, 16, and 16½ are connected to the beveled ends of the boards 22 and 24. 80

28 is a valve placed in the section 5 of the lower board, which permits the air to enter the chamber 4 as the lower sections, 5 6, fall, and as these sections are raised the air passes through the valve 2 into the reservoir 3, and from thence out through the opening 29 in the nose 9 and through the tuyere or nozzle 30. 85

Attached to the section 6 of the top board is a valve, 31, on which bears a spring, 32, the valve being covered by a perforated hood, 33, to protect the valve and prevent dust and dirt from entering the bellows. 90

34 is a pin secured to the center board, 1. This pin acts to open the valve 31 when the reservoir 3 is nearly closed. The object of this valve is to provide a vent for the gases which rush back into the bellows after the air has been forced out and thus prevent danger of the bursting of the bellows, as often occurs. It will readily be seen that as soon as the reservoir 3 is inflated again, the valve will recede from the pin, and the spring 32, bearing against the opposite side of the valve, will keep it 100

closed until the valve touches the pin again. The bellows has central trunnions, 36, engaging in upright supports 37. To increase the force of the blast, I may place a spring, 38, each side of the bellows, the upper end of each spring being attached to a cross-bar, 39, at the top of the bellows, while the other ends are connected to the uprights 37 at a point below, so that the springs will tend to draw down the top.

40 is the operating-lever attached to a rock-bar, 41.

42 are adjustable arms or strips secured to the rock-bar near its ends, and which are connected by their outer ends to a bar, 43, under the bellows by means of rods 44.

To decrease the blast of the bellows, I may use a spring, 45, secured at its upper end to the frame in which the bellows are supported and at its lower end to the cross-bar 39. When this spring is to be used, the springs 38 would of course be removed, as they are employed only when an increase of blast is desired.

I claim as my invention—

1. A bellows constructed with inclined forward top and bottom boards and horizontal rear top and bottom boards, the said boards being united, respectively, with each other by flexible joints and suitable valves, substantially as described.

2. In a bellows, the combination of the front top and bottom boards and the rear top and bottom boards, said boards being connected with each other respectively by flexible joints, a rigid center board extending the entire length of the inside of the bellows, a series of gore-shaped boards interposed between the top and bottom boards and secured in place by flexible joints, and the valves, substantially as described.

3. In a bellows, the combination of center board, 1, provided with valve 2, top and bottom boards, 5 6 5 6, secured together by flexible joints, nose 10, secured to sections 6 6 by flexible joints, nozzle on the nose, end boards, 22 24 22 24, secured to each other and to the center, top, and bottom boards, 5 5, by flexible joints, forward side gore-shaped boards, 11 14 11 14, secured to each other and to the center, top, and bottom boards by flexible joints, rearward side gore-shaped boards, 15 15½ 16 16½ 15 15½ 16 16½, secured to each other and to the center, top, and bottom boards by flexible joints, flexible diamond-shaped pieces connecting forward boards, 11 14, and rear boards, 15 15½, below the center boards, and the forward boards, 11 14, and rear boards, 15 15½, above the center board, and flexible diamond-shaped pieces connecting rearward boards, 16 16½, to the end boards, 22 24, substantially as shown and described, and for the purpose set forth.

4. In combination with the bellows, made substantially as described, the lever 40, rock-bar 41, adjustable arms, and rods 44, as specified.

5. In a bellows, the combination, with the top and bottom, of a series of gore-shaped boards interposed between the same, the upper and lower most boards having their broad ends placed in a forward position, the center boards being arranged in an opposite position, said boards and top and bottom being united by flexible joints, and the valves, substantially as described.

FRANK CHRISTEN.

In presence of—

JAS. E. KNIGHT,
EDW. S. KNIGHT.