

No. 644,556.

Patented Feb. 27, 1900.

S. M. JOHNSON.

SUCTION BOX FOR PAPER MAKING MACHINES.

(Application filed Feb. 7, 1899.)

(No Model.)

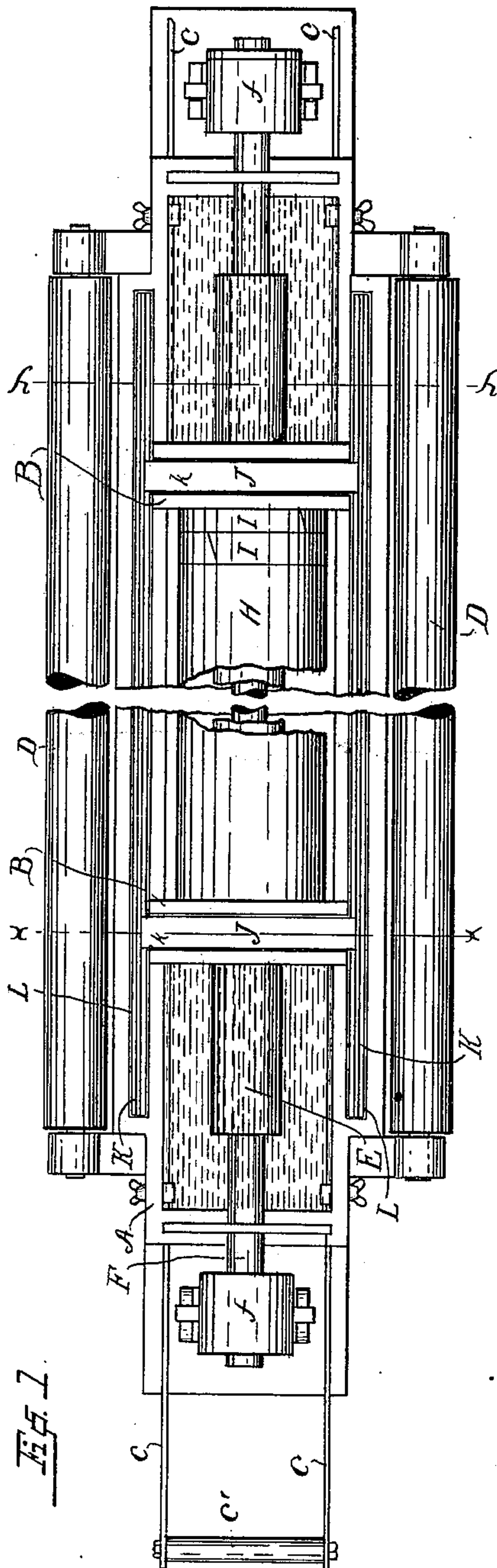


Fig. 1.

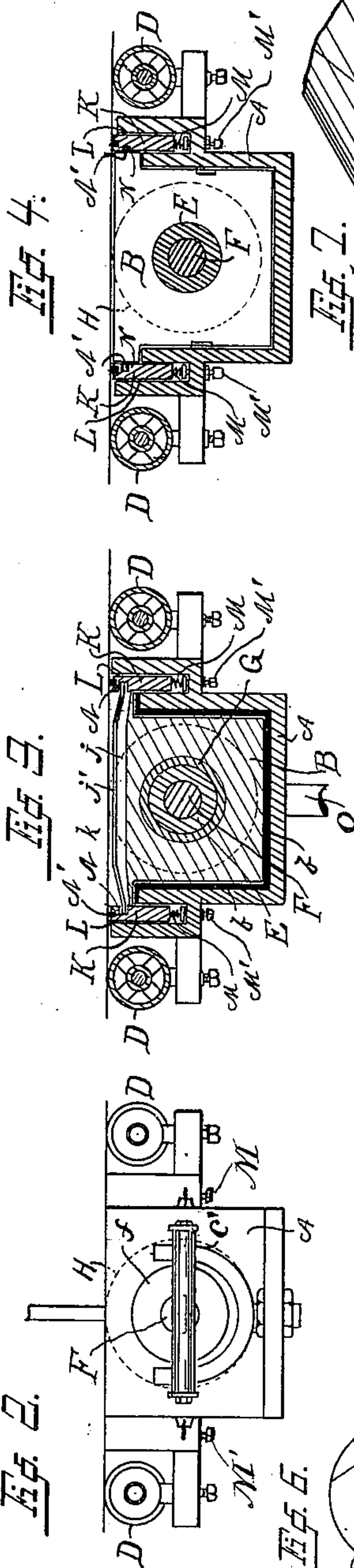


Fig. 2.

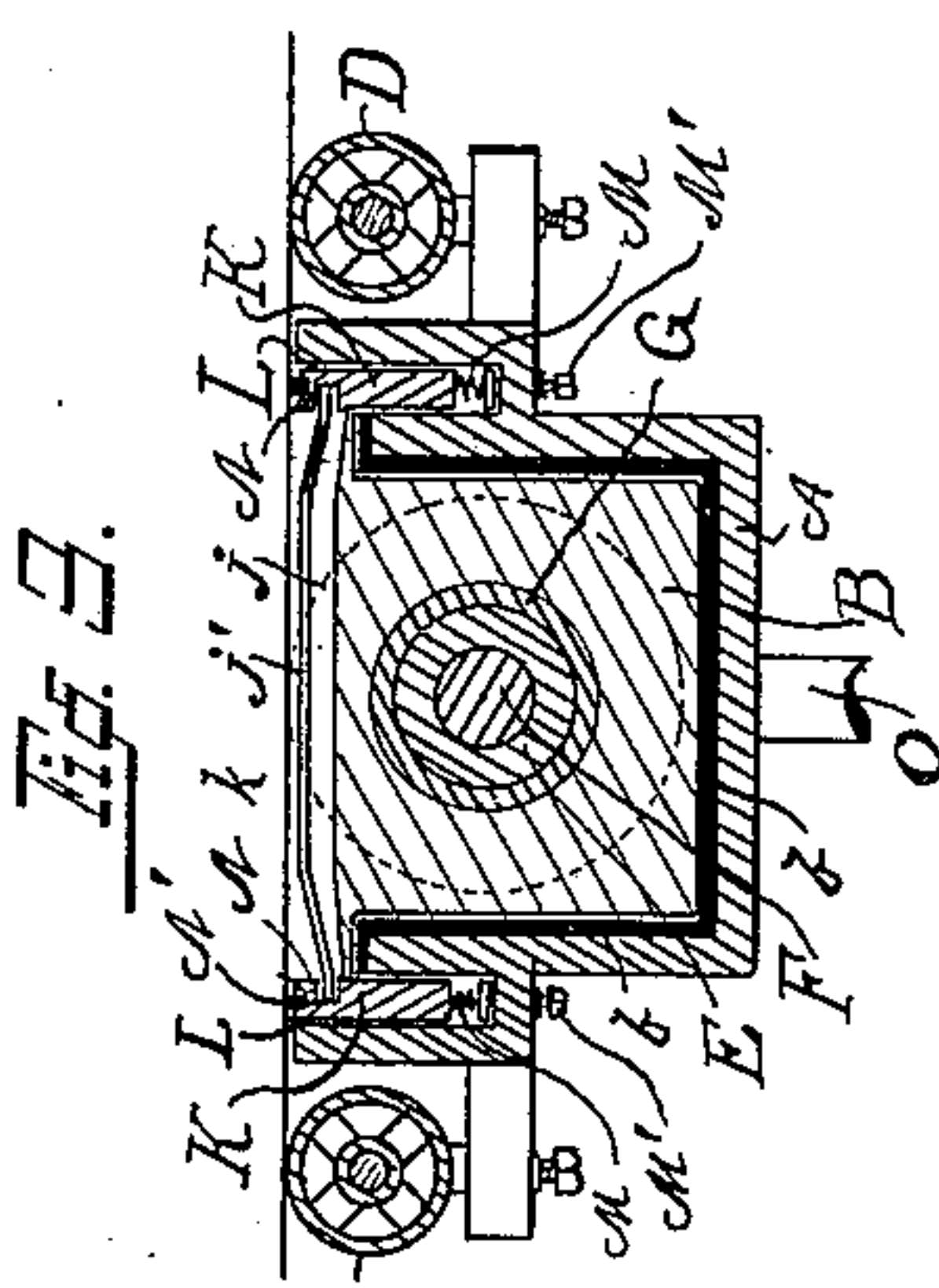


Fig. 3.

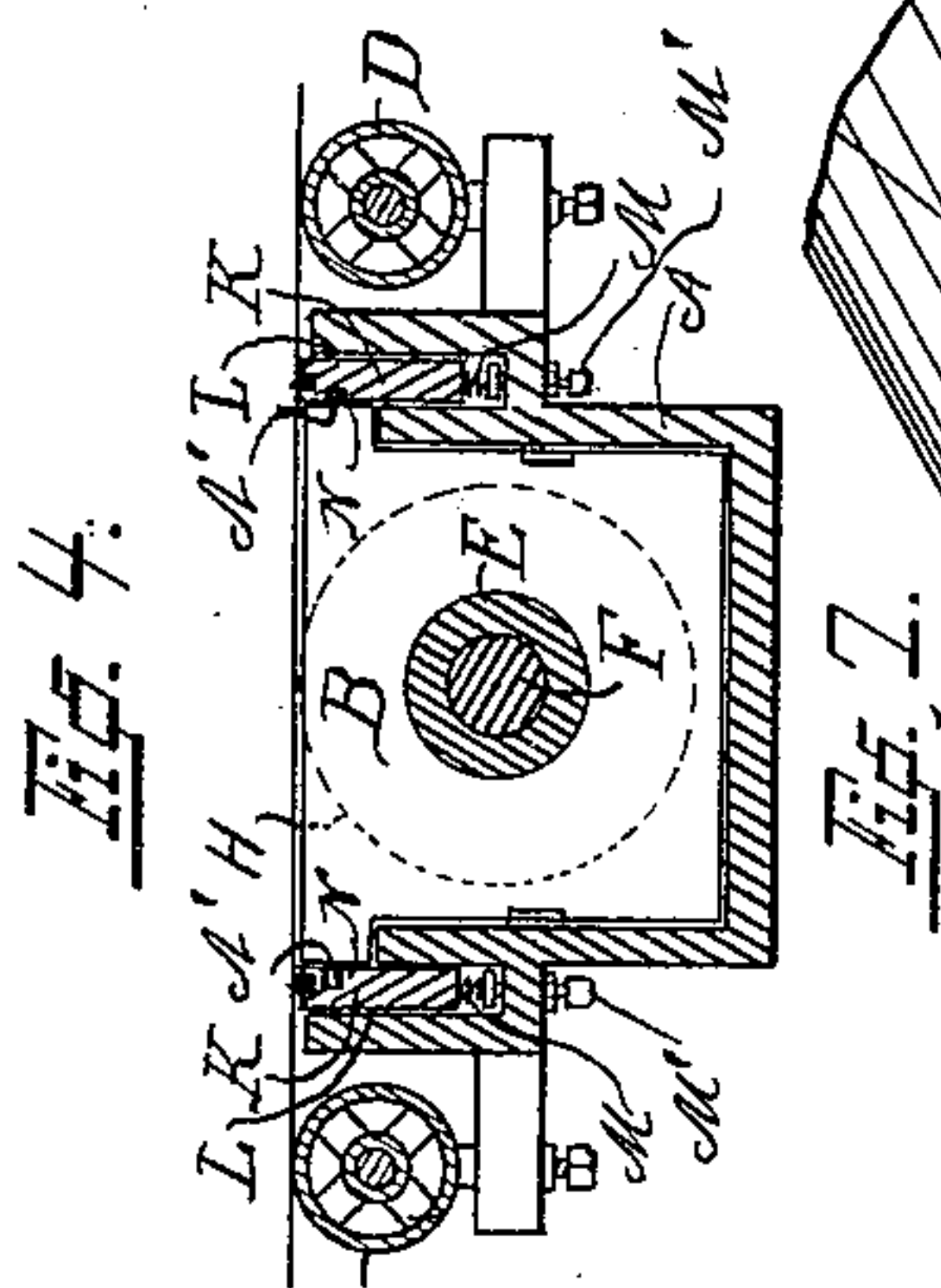


Fig. 4.

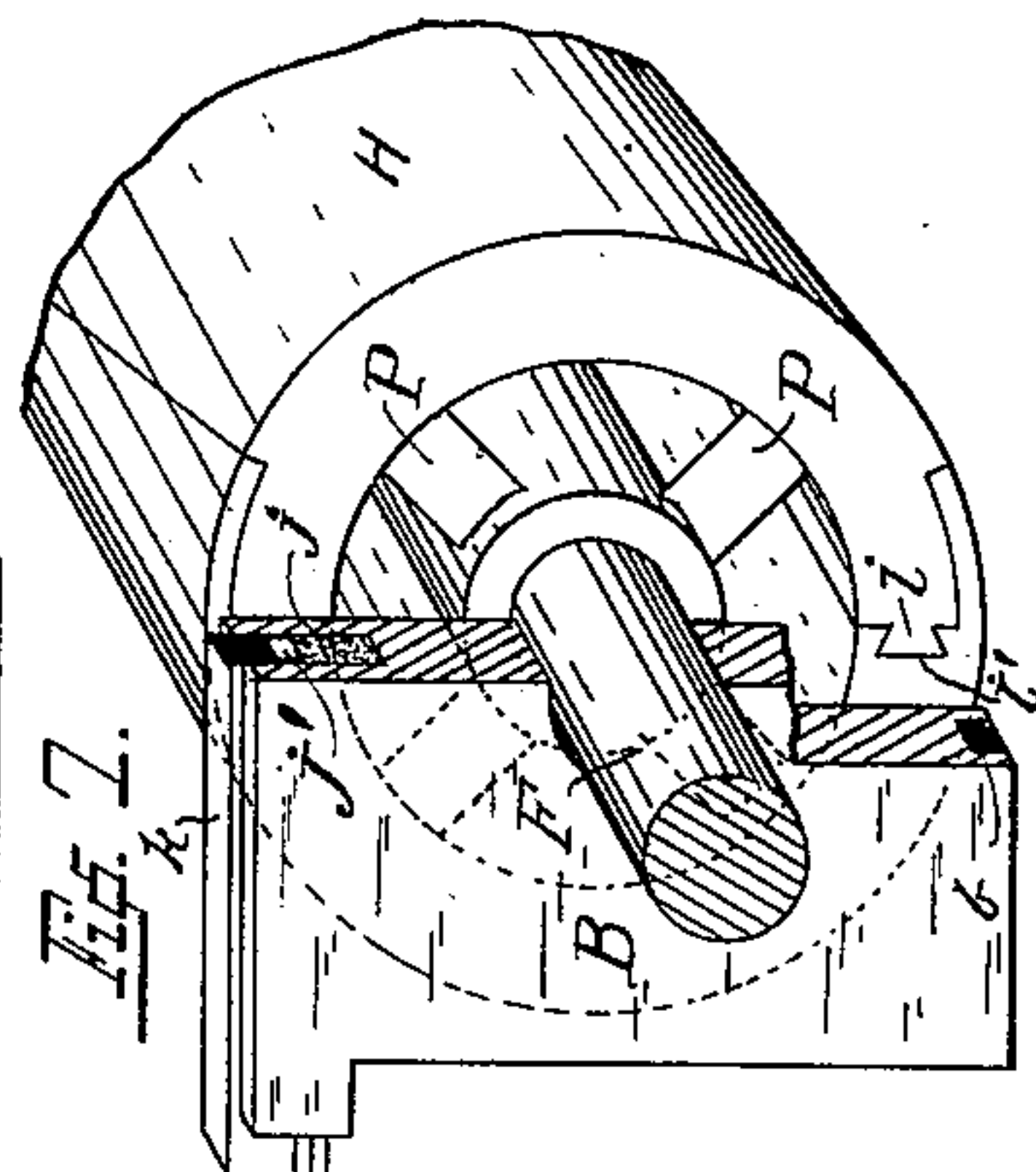


Fig. 5.

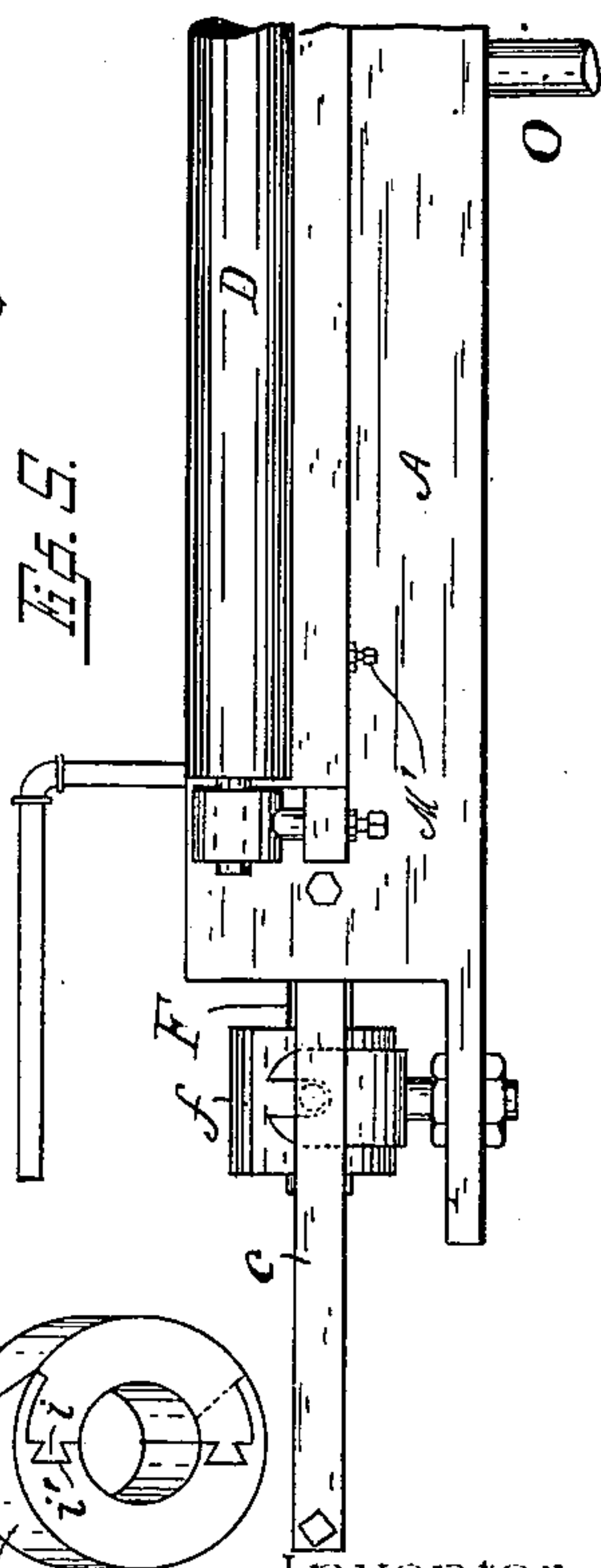


Fig. 6.

Witnesses.

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UNITED STATES PATENT OFFICE.

SEIGVERT M. JOHNSON, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO PETER WAGNER, OF SAME PLACE.

SUCTION-BOX FOR PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 644,556, dated February 27, 1900.

Application filed February 7, 1899. Serial No. 704,805. (No model.)

To all whom it may concern:

Be it known that I, SEIGVERT M. JOHNSON, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Suction-Boxes for Paper-Making Machines, of which the following is a specification.

My invention relates to improvements in that class of suction-boxes in which antifrictional devices are employed to reduce the wear on the pulp-conveying apron.

The object of my invention is to provide means whereby antifriction-rollers may be employed to support the apron without admitting air to the interior of the suction-chamber.

In the following description reference is had to the accompanying drawings, in which—

Figure 1 is a plan view of my invention. Fig. 2 is an end view of the same. Fig. 3 is a sectional view drawn on line *x x* of Fig. 1. Fig. 4 is a sectional view drawn on line *y y* of Fig. 1 and looking toward the center of the box. Fig. 5 is a side elevation. Fig. 6 is a detail view of the supplementary collars or rings for the central roller. Fig. 7 is an enlarged detail showing the head and central shaft with a form of sleeve or collar adapted to support the apron therefrom, thus dispensing with the intervening roller.

Like parts are identified by the same reference-letters throughout the several views.

A is a rectangular box or casing, open at the top and provided with air-tight sides and bottom.

B B are adjustable heads fitting said casing and projecting over the edges thereof, as best shown in Fig. 3, with suitable packing *b* interposed to prevent leakage.

c are bars or rods for adjusting the heads. These extend outwardly through the ends of the box or casing and are preferably connected by means of cross-bars *C'*.

The pulp-conveying apron is supported above the casing A and heads B by means of rollers D on each side, and a roller E may also be located within the chamber on a shaft F, which extends through the ends of the casing A and is provided with exterior journal-bearings *f*. Suitable packing-rings G

are located in the heads B around the roller E, as best shown in Fig. 3.

The suction-chamber is located between the heads B B, and in order to support the apron above this chamber I have provided a sleeve H, which is adapted to be supported from the shaft F in such a manner that its upper surface is on a level with or preferably slightly above the heads. As the heads are adjusted outwardly and inwardly the intervening space between them and the sleeve is occupied by short removable sleeves or collars I, which supplement the sleeves H. These collars are of various widths, and a sufficient number of them are provided to meet the requirements of the different adjustments. They are preferably formed in sections to facilitate their attachment or removal.

The collars I may be provided with any suitable means for securing the sections together which permit them to be quickly engaged or disengaged and which will not tear or damage the apron. A convenient form of construction is illustrated in Fig. 6, in which the collar-sections are provided with counterpart dovetailed tongues and grooves *i* and *i'*, respectively, whereby they may be readily secured together by a sliding movement. The sections are also preferably so formed that the line of severance on their periphery extends diagonally across the collar, so that the pulp-apron will not be caught in the joint. The tongues and grooves should extend transversely or at right angles to the edges of the collar, thus avoiding any tendency of the sections to pull apart laterally.

To prevent the air from entering the suction-chamber underneath the pulp-apron, I have provided a frame having cross-bars J J, secured in channels in the heads, as hereinafter explained, and side bars K K, located in channels L at the sides of the casing, the bars K being provided with grooves N, in which tongues N' on the cross-bars are entered. The frame is pressed against the under side of the apron by springs M or by water-pressure exerted in the channels L or any other suitable means.

M' are set-screws for regulating the upward pressure of the springs.

The suction exerted against the interior

walls of the frame holds the sides in intimate contact with the casing, and the end pieces are similarly drawn snugly against the interior walls of the channels in the cross-heads, thus serving to effectually exclude the air, especially when the frame is made of or covered with rubber, as is preferred. That portion K of the frame which contacts with the apron is preferably formed of hard rubber, upon which the wear of the apron is but slight, as the pressure of the apron is borne by the rollers and the upward pressure of the frame is comparatively light.

The cross-bars J are preferably formed with a soft-rubber base *j*, (which may, if desired, be permanently secured to the head,) with a metallic reinforcing-strip *j'*, and a hard-rubber cap or bearing-surface *k*, as heretofore mentioned. As the tongues N' of the cross-bars are engaged in the channels of the side bars, the entire frame rises and falls in unison, corresponding to the vertical movement of the apron when the latter is subjected to an intermittent suction. The soft-rubber base *j* of the cross-bar will yield sufficiently to permit the required movement of the frame, or if loose in the cross-head it will be drawn by the suction against the side of the channel, and thus exclude the air.

It will be understood that the suction is applied at or near the center of the casing A by means of a pipe O and that the casing exterior to the suction-chamber is filled with water in the usual manner. It will also be understood that in case narrow suction-boxes are used the central roller may be dispensed with and the side rollers relied upon to support the apron, although it will be found difficult to adjust the frame to the apron or properly hold the pulp if the apron is permitted to sag materially between the rollers. The sleeves H or collars I may, however, be readily supported directly from the shaft F, and thus dispense with the roller E, as illustrated in Fig. 7. In such case a web P is preferably used in order to reduce the weight, as the sleeves would otherwise have to be of considerable thickness.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a suction-box for paper-making machines, the combination, with the pulp-apron; of a box or casing provided with adjustable heads and a suction-pipe; apron-supporting rollers located at each side of the box or casing; air-excluding devices surrounding the suction-chamber and adjustable therewith; and means for automatically adjusting such devices to correspond with the vertical movement of the apron.

2. In a suction-box for paper-making machines, the combination, with the pulp-apron; of a box or casing provided with adjustable heads and a suction-pipe; a frame provided with adjustable cross-bars; means for pressing said frame upwardly against the apron;

and devices for regulating said pressure; the sides and cross-bars of said frame being adapted to cooperate with the box or casing, and its adjustable heads in excluding air from the suction-chamber.

3. In a suction-box for paper-making machines, the combination, with the pulp-apron; a box or casing provided with adjustable heads and a suction-pipe; apron-supporting rollers located at each side of the box or casing; a frame provided with adjustable cross-bars engaged in channels in the upper surfaces of said heads; and means for pressing said frame upwardly against the apron, said frame being adapted to cooperate with the box or casing, and its adjustable heads in excluding air from the suction-chamber.

4. In a suction-box for paper-making machines, the combination, with the pulp-apron; of a box or casing provided with adjustable heads; apron-supporting rollers located at each side of the box or casing; a frame provided with adjustable cross-bars, having a yielding under surface secured to said heads; and means for pressing said frame upwardly against the apron, said frame being adapted to cooperate with the box or casing, and its adjustable heads in excluding air from the suction-chamber.

5. In a suction-box for paper-making machines, the combination with the pulp-apron; of a box or casing provided with adjustable heads and a suction-pipe; apron-supporting rollers located at each side of the box or casing; a frame provided with channeled side bars and adjustable cross-bars engaged in said channels; and means for pressing said frame upwardly against the apron, said frame being adapted to cooperate with the box or casing and its adjustable heads, in excluding air from the suction-chamber.

6. In a suction-box for paper-making machines, the combination, with the pulp-apron; of a box or casing provided with adjustable heads and a suction-pipe; an apron-supporting roller extending through said heads; a sleeve supported on said roller; supplementary collars adapted to be supported on said roller; a frame provided with adjustable cross-bars; and means for pressing said frame upwardly against the apron, said frame being adapted to cooperate with the box or casing and its adjustable heads, in excluding air from the suction-chamber.

7. In a suction-box for paper-making machines, the combination, with the pulp-apron; of a box or casing provided with adjustable heads and a suction-pipe; a shaft extending through said heads; one or more apron-supporting sleeves or rollers disposed thereon between the heads; with supplementary devices for adjusting the support to correspond with the length of the space between the heads; together with an adjustable air-excluding frame adapted to press upwardly against the apron around the sides and heads of the box or casing.

8. In a suction-box for paper-making machines, the combination, with the pulp-apron; of a box or casing provided with adjustable heads and a suction-pipe; and an adjustable
5 air-excluding frame for said box or casing; a shaft extending through said heads; and a set of sleeves or collars adapted to be supported on the shaft and to be used either interchangeably or collectively in the space between the heads, to support the pulp-conveying apron.

9. In a suction-box for paper-making machines, the combination, with a pulp-apron; of a box or casing provided with suitable air-excluding devices; a shaft extending through
15 the heads of the box or casing; and a sleeve carried by the shaft and adapted to support the apron between the heads.

10. In a suction-box for paper-making machines, the combination, with a pulp-apron; of a box or casing provided with adjustable heads; a shaft extending through the heads of the box or casing; and a set of sleeves or collars, adapted to be adjusted on the shaft
25 between the heads, to support the pulp-conveying apron.

11. In a suction-box for paper-making machines,

the combination, with a pulp-apron; of a box or casing provided with adjustable heads and suitable air-excluding devices; a
30 shaft extending through the heads of the box or casing; and a set of sectional sleeves or collars adapted to be adjusted on the shaft between the heads, and to support the pulp-conveying apron, some of said sleeves or collars being formed in detachable sections,
35 adapted to be secured together around said shaft.

12. In a suction-box for paper-making machines, the combination, with a pulp-conveying apron; of a box or casing provided with
40 suitable air-excluding devices; a shaft extending through the heads of the box or casing; and a sleeve carried by the shaft and adapted to support the apron between the heads; together with a reinforcing-web for
45 said sleeve.

In testimony whereof I have hereunto set my hand this 1st day of February, 1899.

SEIGVERT M. JOHNSON.

Witnesses:

LEVERETT C. WHEELER,
PETER WAGNER.