(Model.)

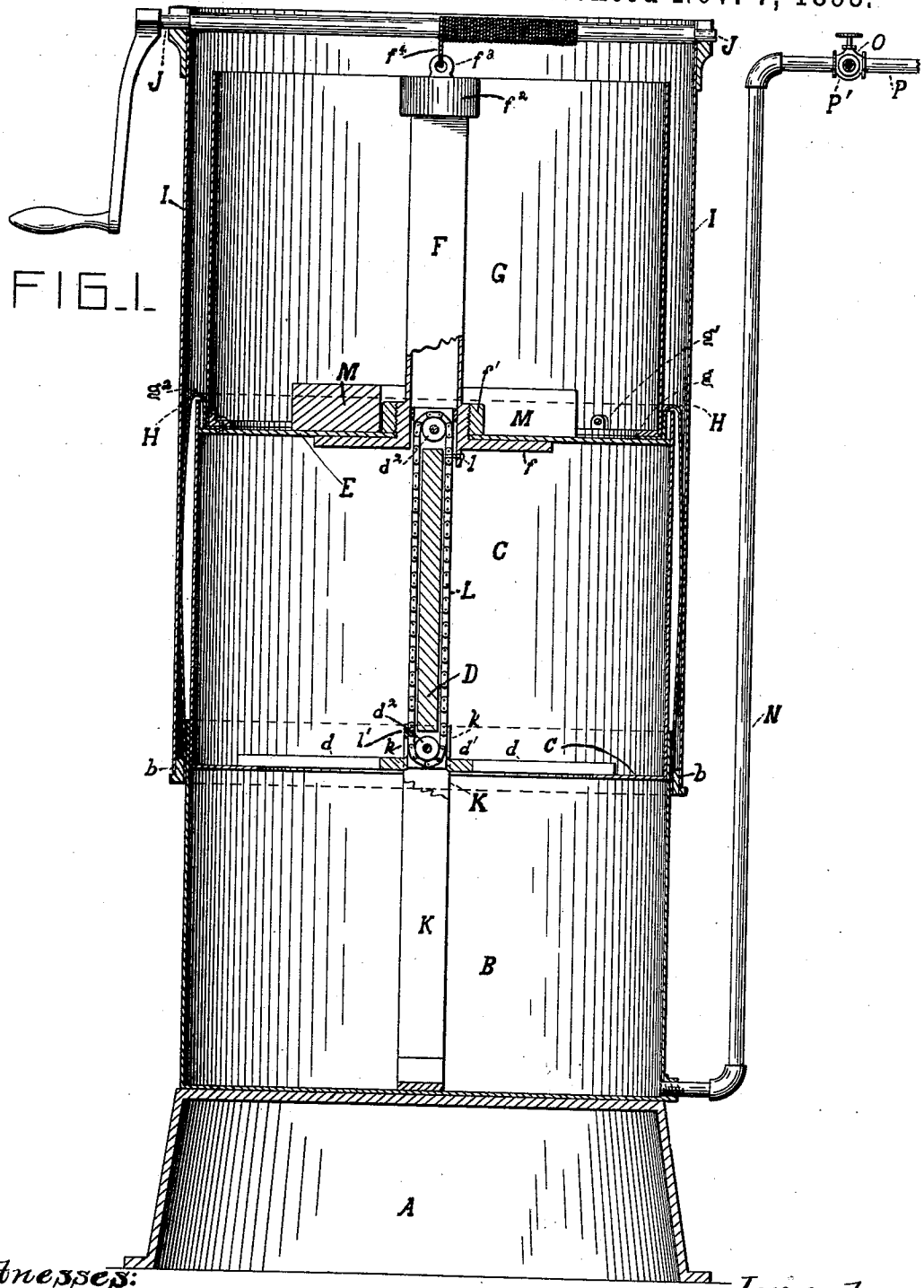
2 Sheets—Sheet 1.

J. KNOCHE.

AIR COMPRESSOR.

No. 508,225. Patented Nov. 7, 1893.

FIG. 1.



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(Model.)

2 Sheets—Sheet 2.

J. KNOCHE.

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No. 508,225. Patented Nov. 7. 1893.

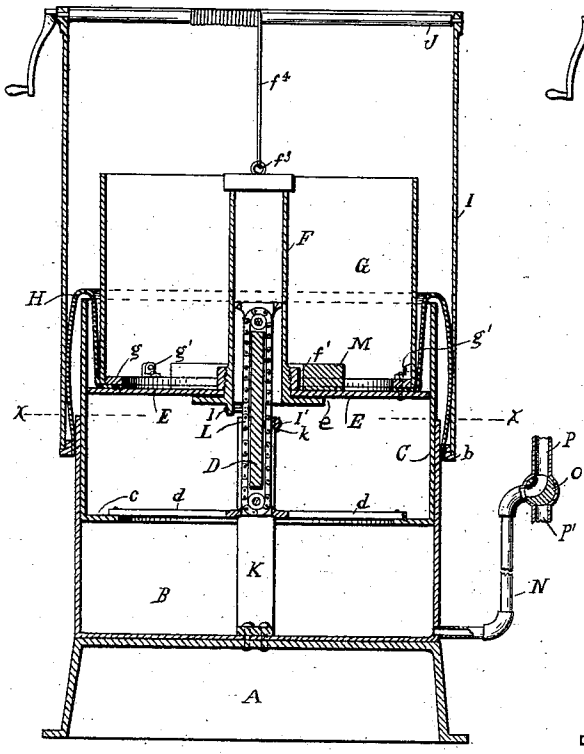

Fig. 2.

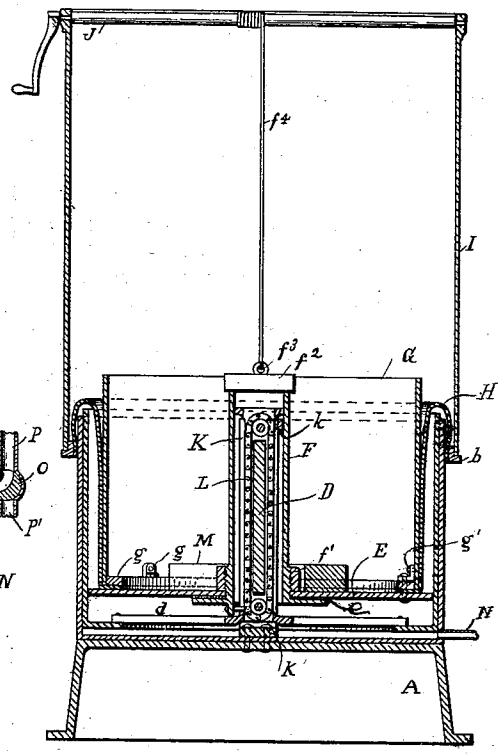

Fig. 3.

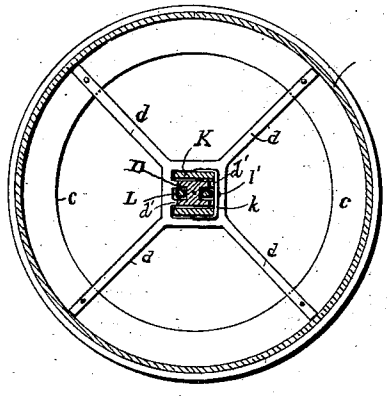

Fig. 4.

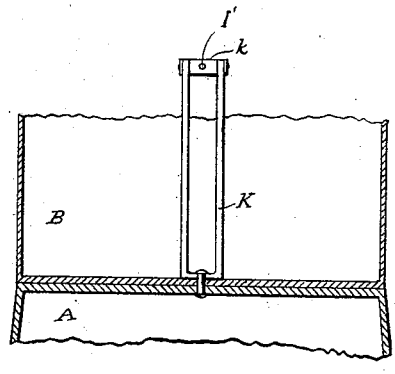

Fig. 5.

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JOHN KNOCHE, OF CINCINNATI, OHIO.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 508,225, dated November 7, 1893.

Application filed June 27, 1892. Serial No. 438,172. (Model.)

To all whom it may concern:

Be it known that I, JOHN KNOCHE, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification.

My invention relates to air compressors, and particularly to that class employed for forcing a pressure of air into a closed vessel, to supply the vacuum caused by drawing the liquor out of the vessel, and to force the liquor from a faucet arranged above the vessel. It is especially designed to force malt liquors from a cellar or basement to the tap room above.

The invention consists of the peculiar combinations and arrangements of the device, all of which will be first fully described in connection with the accompanying drawings and then particularly referred to and pointed out in the claims.

In the drawings, Figure 1 is a vertical diametrical section of my improved apparatus, with the plunger drawn up to its highest position. Fig. 2 is a similar section showing the cylinders partly telescoped, with the air inlet and outlet pipes, and the valve for said pipes shown in section and at a right angle to the view shown in Fig. 1. Fig. 3 is a view in the same plane showing the cylinders wholly telescoped. Fig. 4 is a detailed view in transverse section taken through line $x\,x$ of Fig. 2, some of the parts being omitted for clearness. Fig. 5 is a detailed view in central vertical section taken in plane at right angles to views shown in Figs. 1, 2 and 3.

Referring to the parts by reference letters, A is a cast metal base in the form of an inverted pan, but the form is not material as its office is only to elevate the compressor above the floor. B is a sheet metal cylinder closed at the bottom. C a cylinder fitted to slide within the cylinder B. It is entirely open at the top and the bottom edge is inturned forming a flange c, to support a fixed standard D, which has feet d, extending outwardly from it to rest upon and be secured to said flange c. A follower E preferably of cast metal is fitted to slide within the cylinder C. The follower E, is centrally perforated to receive the screw threaded collar of a rectangular box F, the flange f of which rests against the under side of the follower. A nut f' is screwed over the collar to rigidly clamp the follower between it and the flange f. The joint between the parts is made air tight by neat fitting, or suitable packing e as seen in Figs. 2 and 3. The top of the box F, has also a circular screw threaded collar, to receive a screw threaded cap f^2 which has a ring f^3 to which the winding rope f^4 is secured.

G is a cylinder within the lower edge of which is secured a cast metal ring g. The ring g has upwardly projecting perforated lugs g' to pass the screws which secure the ring within the cylinder. The chamber formed by the cylinders B. C. and follower E is made air tight by the rubber tube H, the lower end of which is slipped around the top of the cylinder B, and is held in place by a flanged metal hoop or ring b. The upper end of the tube is drawn over the top of the cylinder C, laps upon the top of the follower E, and is firmly clamped between the top of the follower and the ring g, by screws passing through the ring and tube, and tapped into the follower, thus securing the cylinder G upon the follower E. The rubber tube is protected by a cylinder I, the lower edge of which rests upon the flange of ring b. In the upper edge of the cylinder I, is journaled a windlass J, to wind up the rope f^4, and extend the parts as shown in the drawings.

Secured to the bottom of the vessel B are two parallel bars K formed preferably by bending a metal bar in the middle, which bars extend through guide lugs d' in the feet or base of the standard D. Around the ends of the bars K which extend into the vessel C is secured a rectangular loop k. The standard D is slotted at each end to receive pulleys d^2 which are journaled between the lugs formed by slotting the bar. The endless chain L passes over these pulleys and is secured by a screw l, to a lug projecting down from the flange f, and by a screw l' to box or loop k, which braces the bars K apart at the top. The bar D is grooved upon each edge to embed the chain and prevent it from rubbing against the sides of the box F, as the follower descends into the vessel C. The purpose of connecting the chain respectively to the follower and the standards K, is to insure a si-

multaneous movement of the follower and vessel C when they are being carried down by weight M placed upon the follower or extended to the position shown by winding the rope around the windlass.

A pipe N, is connected to the bottom of the vessel B, and extends up to near the top of the device, and at its end is provided with a three-way cock O, which has two branches P. P′. connected to its case; the one P, for attaching a pipe or flexible tube which connects with the air space in a liquid vessel, and the other P′ opens to the air, or may be connected to the ordinary air filtering vessel, or a refrigerating chamber in order to supply the compressor with pure or cold air to be forced into the liquor keg or barrel.

In the drawings the parts are shown in the elevated position, the compressor filled with air and the cock N, turned to open communication between the compressor and the vessel from which liquor is to be drawn. The air pressure is regulated by placing the desired number of weights as M in the vessel G upon the compressor E. When the faucet in the tap room is opened, the beer, ale or other liquor is forced with the pressure exerted by the weight of the follower, weights upon it, and the weight of the cylinder C, and the pressure will remain constant until the follower and cylinder C reach the lower limit of their travel. As the cylinder C and follower E are fitted to slide freely in their descent some air will escape into the space between the rubber tube and the vessel C forming an air cushion between the parts which will prevent the tube from being injured by rubbing on the metal. When the follower and cylinder C, have reached the limit of their descent, the cock O is turned to cut off communication with the liquid vessel, and open communication through the branch P′ between the atmosphere and the cylinder B. While the follower and the cylinder C are being again elevated by means of the windlass, air will be drawn into the compressor until the follower and the cylinder C, reach the upper limit of their travel, when the cock is again turned to allow the compressed air to flow into the liquor vessel.

It is obvious that instead of the three way cock O and branch P′ a separate air pipe may be attached to the air chamber and be provided with an inwardly opening check valve or both the air inlet and outlet pipes may be provided with straight-way cocks.

What I claim is—

1. In an air compressor of the character described, the combination of the fixed vessel, a cylinder fitted to slide therein, a follower fitted to slide within said cylinder, a flexible air tight tube having one end connected to the fixed vessel and its opposite end passing over the sliding cylinder and secured upon the follower, air inlet and outlet pipes, valves for said pipes, and means such as shown to elevate the follower and sliding cylinder, substantially as shown and described.

2. The combination of the fixed vessel, the sliding cylinder C the follower within said cylinder, the bar D centrally fixed within said cylinder, the guide bars K, centrally secured to the bottom of the fixed vessel and extending up upon each side of the bar D, the pulleys journaled in each end of said bar, the chain passing around said pulleys and secured respectively to the bars K, and the follower the box F secured to the follower, the rope connected to the top of said box, the windlass for elevating the follower and cylinder, the pipe N, the three way cock, the branches P, P′, and the flexible tube having its opposite ends connected to the fixed vessel, and the follower respectively, substantially as shown and described.

3. The combination of the fixed vessel the sliding cylinder the follower fitted to slide within said cylinder, the flexible tube, the flanged ring connecting the lower end of said flexible tube to the fixed vessel, the vessel G and ring *g*, secured upon the follower and clamping the upper end of said tube, the outer cylinder I resting upon the flanged ring, the windlass journaled in the upper edge of the cylinder I, and the windlass rope connected to the follower, substantially as shown and described.

4. The combination of the fixed vessel B having central uprights K, the sliding cylinder C having central upright D, pulleys in each end of said upright, and a chain around said pulleys, the follower E, the box F, having flange *f*, and nut *f′* securing it centrally to the follower, and provided at its top with a cap and ring, the rubber tube H, the rings *b*, and *g*, securing its opposite ends, to the vessel B and the follower respectively the screws connecting the chain to the follower and standard K, the cylinder I resting upon the ring *b* and having a windlass in its upper end for elevating the follower and sliding cylinder, the cylinder G connected to ring *g* removable weights and the valved inlet, and outlet, pipes substantially as shown and described.

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