

No. 657,343.

Patented Sept. 4, 1900.

F. A. FISHER.

STUFFING BOX FOR AMMONIA COMPRESSORS.

(Application filed Jan. 29, 1900.)

(No Model.)

2 Sheets—Sheet 1.

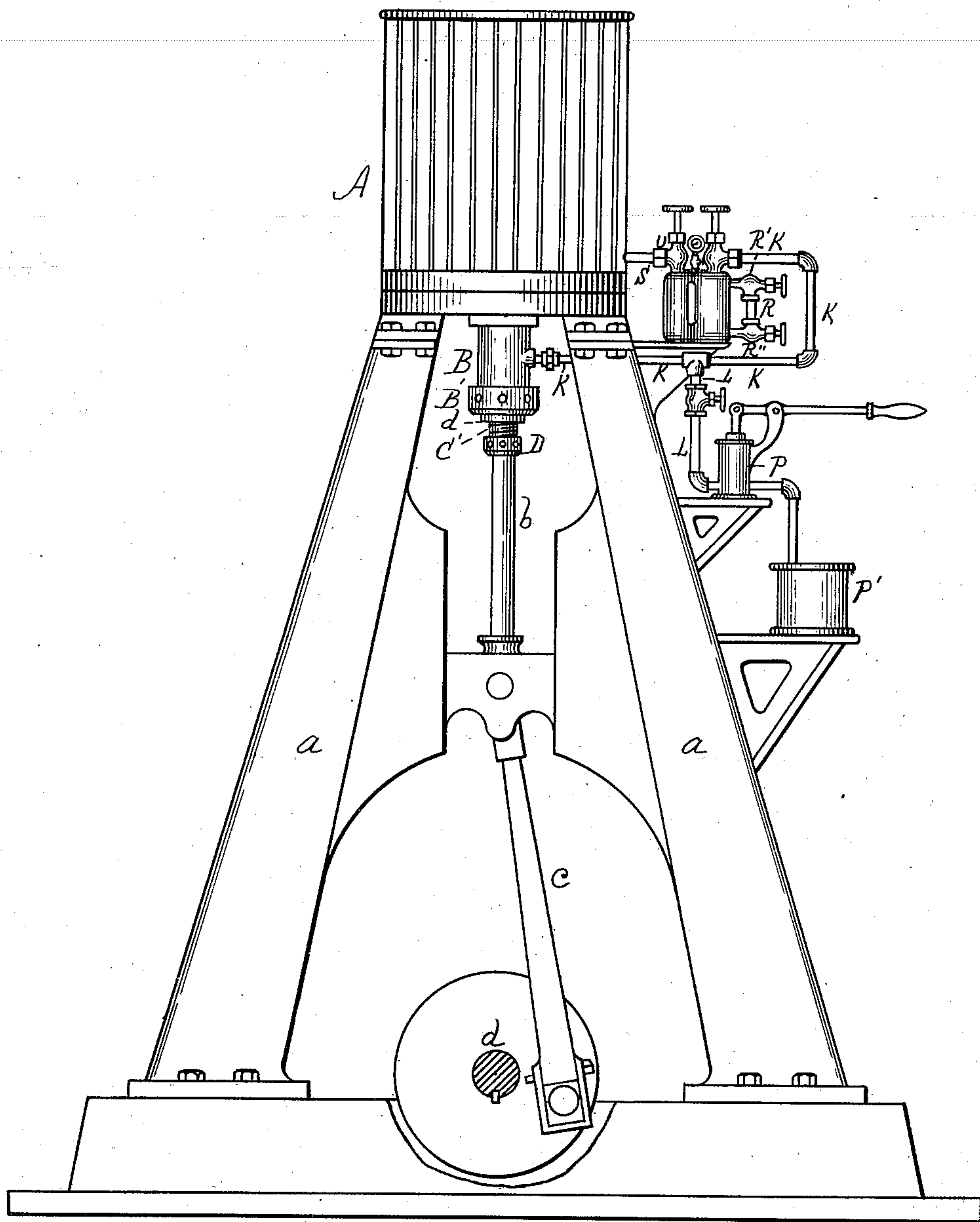


Fig. 1.

WITNESSES

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E. A. Sweet.

INVENTOR

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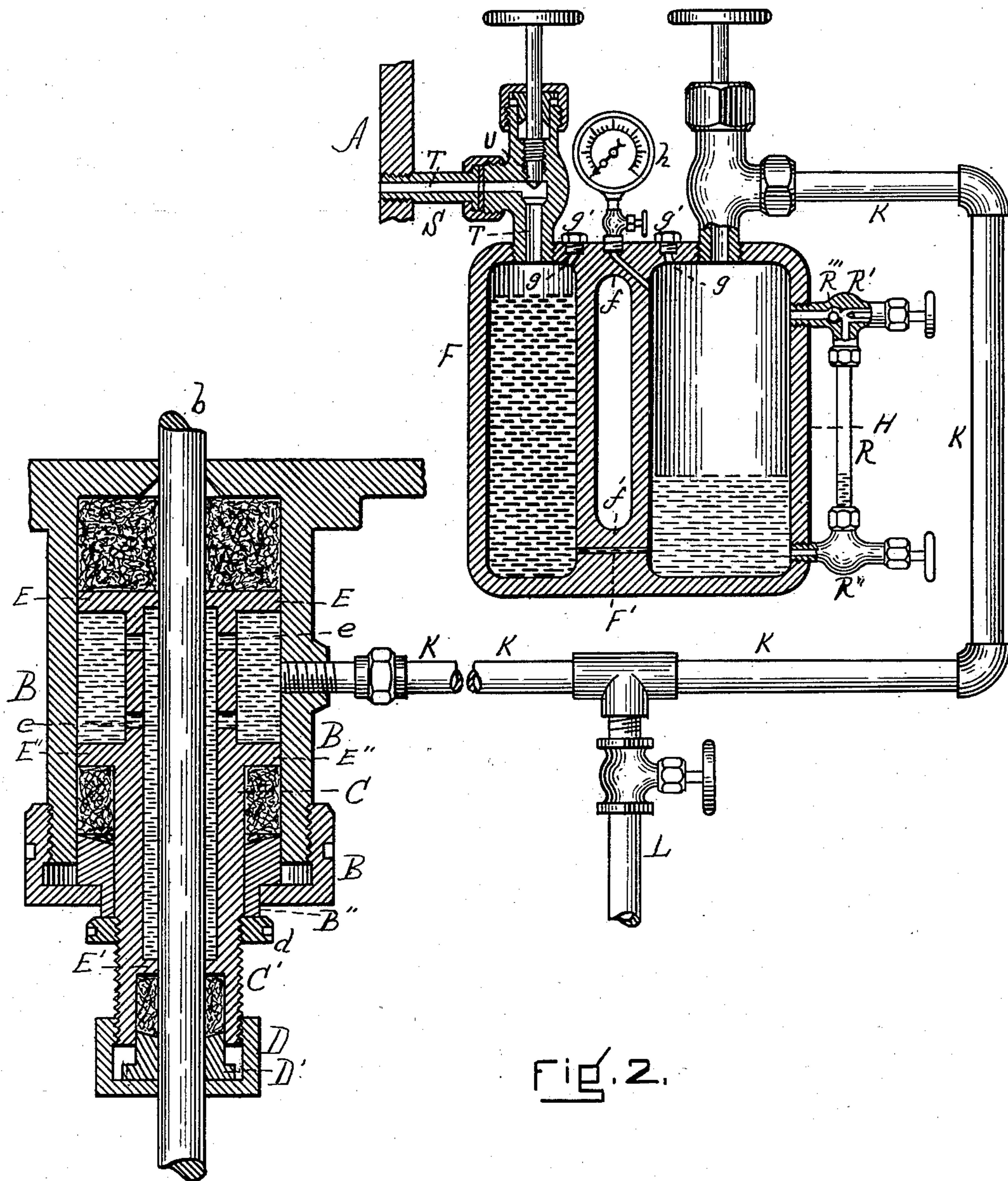


Fig. 2.

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UNITED STATES PATENT OFFICE.

FREDERICK A. FISHER, OF PROVINCETOWN, MASSACHUSETTS, ASSIGNOR
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SAME PLACE.

STUFFING-BOX FOR AMMONIA-COMPRESSORS.

SPECIFICATION forming part of Letters Patent No. 657,343, dated September 4, 1900.

Application filed January 29, 1900. Serial No. 3,130. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. FISHER, a citizen of the United States, residing at Provincetown, in the county of Barnstable and State of Massachusetts, have invented new and useful Improvements in Stuffing-Boxes for Ammonia-Compressors, &c., of which the following is a specification.

This improvement relates to stuffing-boxes and their immediate connections for use in ammonia-compressors or compressors in which any gas, air, or liquid is employed.

In this device there is placed intermediate with the cylinder and stuffing-box an integral casting containing two chambers or tubes unequal in diameter and connected near their lower ends, one chamber or tube containing mercury, which passes through said connection into the other chamber or tube and produces a pressure on the oil in the stuffing-box which is equal to that in the cylinder, such pressure changing automatically as the pressure in the cylinder changes.

The invention consists in the novel construction and arrangement of parts fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation illustrating my invention applied to a stuffing-box of an ammonia-compressor. Fig. 2 is an enlarged vertical section of the invention itself, the cylinder, stand, and pump being omitted.

Similar letters of reference indicate corresponding parts.

A represents the cylinder of an ammonia-compressor, supported by a suitable stand *a*.

B is the case of the stuffing-box, through which the piston-rod *b* extends.

c is the pitman, and *d* the shaft, whereby power is communicated.

Screwed on the lower end of the shell B of the stuffing-box is the follower B', through which the gland B'' extends.

C is the sleeve, whose lower externally-threaded end C' extends down through the gland and is provided with the set-nut *d*. Screwed upon the lower end of the portion C' of the sleeve is the follower D, containing the gland D'. The upper end of the sleeve C is provided with the inwardly and outwardly ex-

tending flange or wall E, and near the lower portion it is provided with the inwardly-extending flange E', the said flanges, with the main portion of the sleeve, producing an oil-receptacle which connects, by means of the openings *e*, with an oil-reservoir formed by the main portion of the sleeve, the upper flange, and a central flange E''. Packing is applied between the upper end of the sleeve and the upper end of the stuffing-box, between the flange E'' and the gland B'', and between the flange E' and the gland D'.

F and H are two tubes or chambers in an integral casting or structure, connected at their upper and lower ends by the portions *f f'*. The tube F is of much less diameter than the tube H, and they are connected near their lower ends by a passage F'. The tube H is connected by the pipe K with the stuffing-box, and said pipe K is connected by the pipe L with a suitable pump P, whereby oil from a tank P' is supplied to the stuffing-box.

R is a gage-glass connected with the tube H by the valves R' and R'', each of which is automatic and provided with a ball R''', whereby the valves would close in case the glass should break.

g g represent the inlet-passages through which the tubes F B are filled, and *g'* are the plugs therefor.

h is an ordinary pressure-gage. A pipe S leads from the interior of the cylinder A to a passage T in the casing U of a valve constructed in the ordinary manner, said valve-casing being screwed into the upper end of the tube F.

The tube F is filled substantially full of mercury and the tube H is filled, say, two-thirds full of oil, as shown in Fig. 2, the filling being done through the passages *g*. The mass of mercury in the tube or chamber F cannot be penetrated by the ammonia, but in combination with the oil and ammonia it makes a pressure on the stuffing-box equal to the pressure in the cylinder automatically against the packing and keeps the box absolutely tight. The pressure varies, of course, with the pressure in the cylinder, so that there is always an equal pressure transmitted from the cylinder to the stuffing-box and a perfect

seal produced for the ammonia-gas or any other gas which may be employed.

Referring to the stuffing-box, the oil is kept from leaking by means of the packing between the gland D' and the flange E' on the sleeve C. By means of its internal construction, and especially that of the sleeve C, provided with its flanges E E' E'' and openings e, the pressure of the oil on the box varies as the pressure of the ammonia in the cylinder varies, such pressure being communicated by the medium of the mercury through the pipe K and directly into the chamber surrounding the sleeve C between the flanges E E'' and thence through the openings e into the long chamber, which is directly around the piston. In this device the friction on the piston-rod is reduced to a minimum, inasmuch as the amount of packing necessary to this box is comparatively small, as the piston is running in a body of oil at all times. The packing need not be as tight as is ordinarily the case, as the pressure of oil is equal to the pressure of the ammonia in the cylinder. Moreover, it will be seen that the packing between the sleeve and the gland B'' is not in contact with the piston-rod, it being only there for the purpose of keeping the oil from leaking out around the follower B'.

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

1. In an apparatus of the character described, the cylinder; the tubes or chambers F, H rigidly connected together and provided with the connecting-passage F' and suitable inlets, said tube F containing mercury and said tube H oil; a stuffing-box around the piston; a tubular connection between the oil-chamber H and the interior of the stuffing-box; and a tubular connection provided with a suitable valve between the mercury-chamber and the cylinder, substantially as described.

2. In an apparatus of the character described, the stuffing-box comprising the case B; the sleeve C, C' provided with the inwardly and outwardly extending flange E, the inwardly-extending flange E', the inwardly-extending flange E'' and the opening e; the gland B'' and follower B; the gland D' and follower D; a mercury chamber or tube and an oil chamber or tube connected rigidly together and communicating with each other by a passage; a pipe connection between the interior of the stuffing-box and said oil-chamber; a cylinder; and a pipe connection between said cylinder and the mercury-chamber, substantially as set forth.

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Witnesses:

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