

(No Model.)

A. T. BALLANTINE.

STUFFING BOX.

No. 317,962.

Patented May 19, 1885.

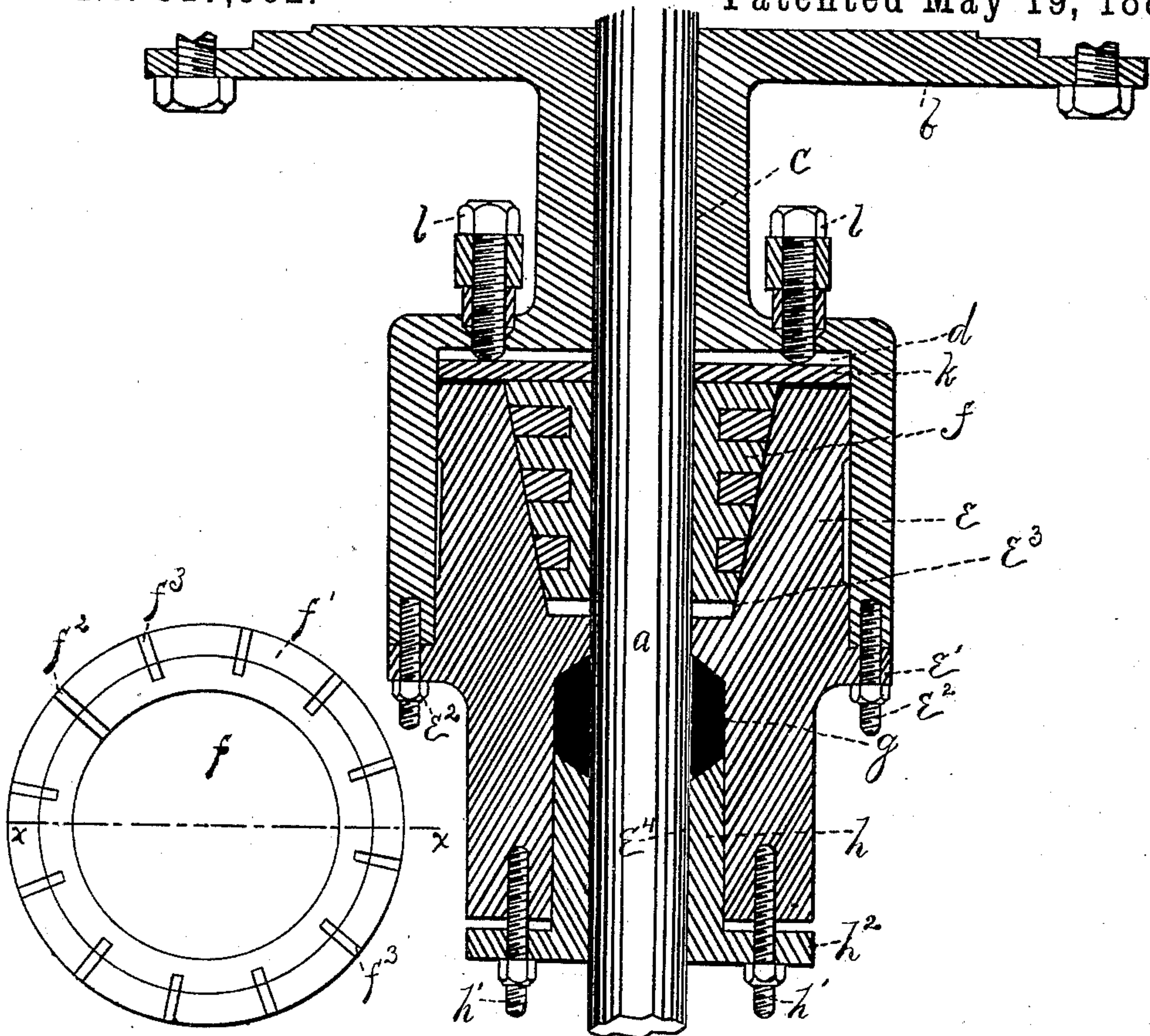


FIG. 2. FIG. 1.

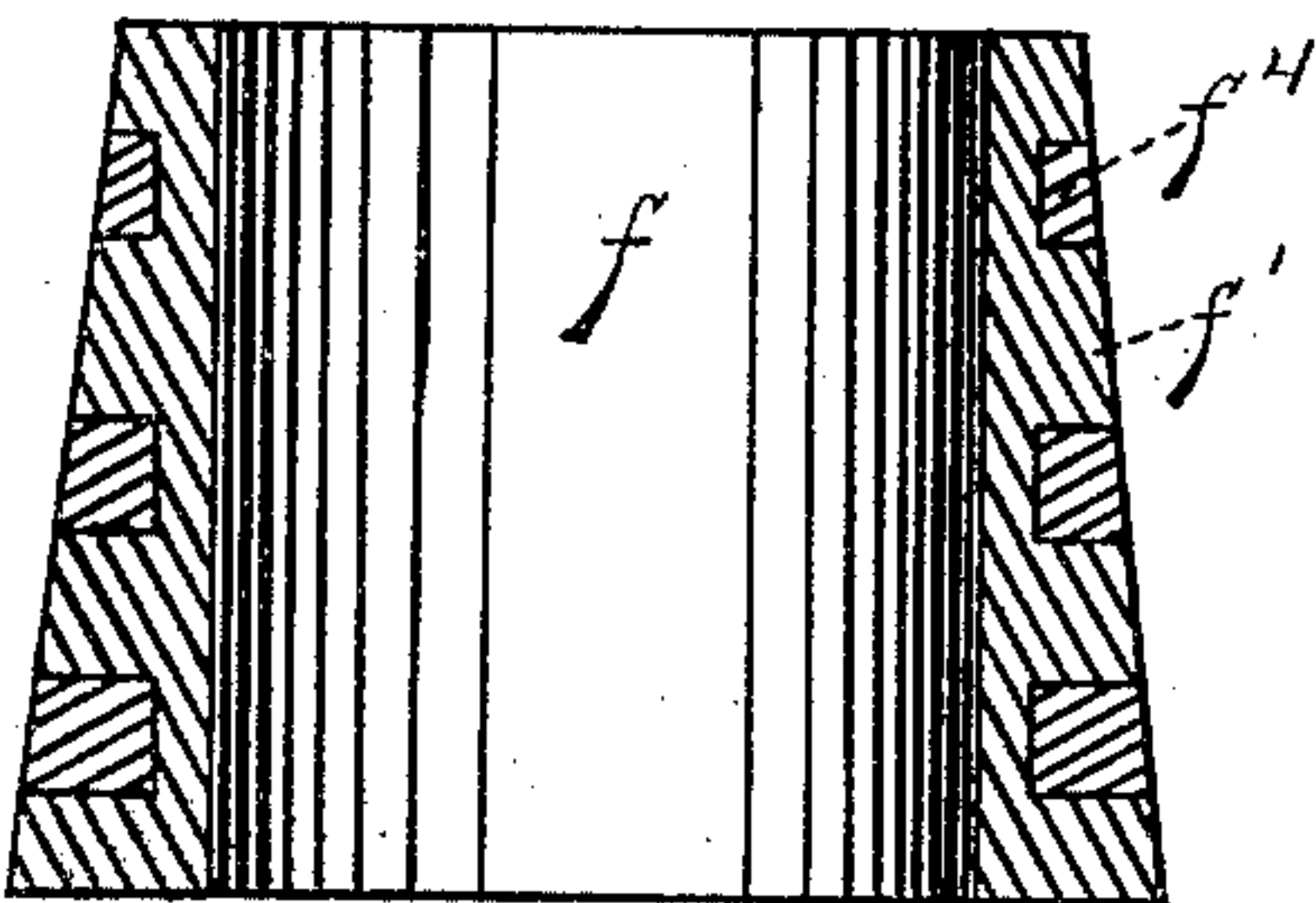


FIG. 3.

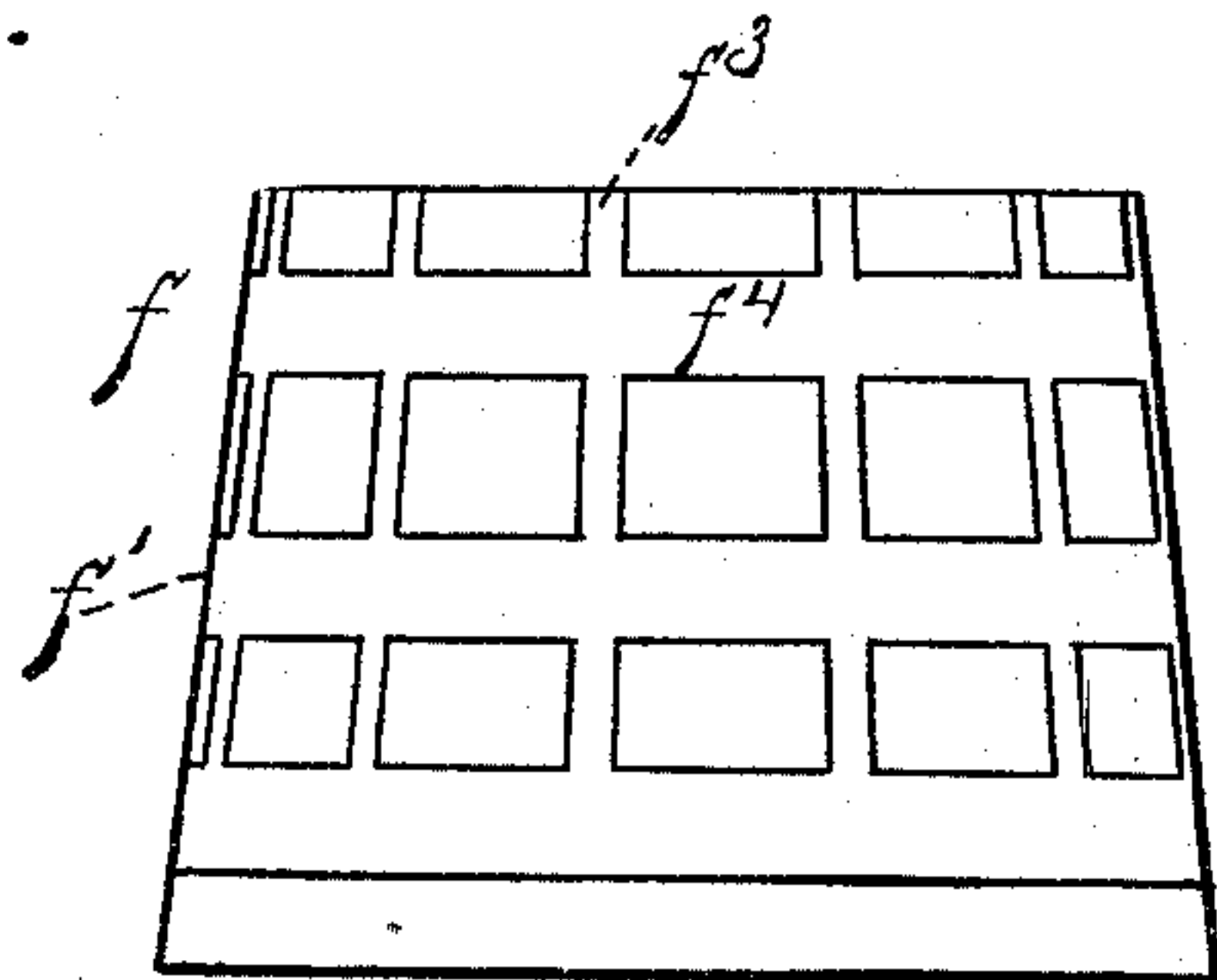


FIG. 4.

Witnesses:

Otto Loddick  
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# UNITED STATES PATENT OFFICE.

ALEXANDER T. BALLANTINE, OF GENEVA, OHIO, ASSIGNOR TO ELLA B. BALLANTINE, OF SAME PLACE.

## STUFFING-BOX.

SPECIFICATION forming part of Letters Patent No. 317,962, dated May 19, 1885.

Application filed March 14, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER T. BALLANTINE, a citizen of the United States, residing at Geneva, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Stuffing-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to stuffing-boxes for vertical engines; and it consists, first, in an improved construction and arrangement of parts within the stuffing-box; and, second, in an improved form of metallic packing-ring.

In the drawings, Figure 1 is a central vertical section of my improved apparatus. Fig. 2 is a top plan view of my improved form of packing-ring. Fig. 3 is a vertical section thereof, taken in the line  $x x$ , Fig. 2; and Fig. 4 is an elevation of the same.

Referring to the drawings,  $a$  represents a section of the piston-rod, and  $b$  the lower head of the cylinder, through which the piston-rod  $a$  passes.  $c$  is an elongated cylindrical chamber, cast with and forming a part of the cylinder-head  $b$ .

Below the chamber  $c$ , and forming an integral part thereof, is another cylindrical chamber,  $d$ , of larger diameter, with open bottom, intended for the reception of the stuffing-box proper.

The stuffing-box shown in section in Fig. 1 consists of the main body  $E$ , of cylindrical form, and of a diameter just sufficient to fit snugly within the chamber  $d$ .

$E'$  is an annular flange, of the same diameter as the walls of the chamber  $d$ , and which, when the stuffing-box is in position, rests against the bottom surface of the walls of such chamber. This flange  $E'$  is intended for the reception of fastening bolts and nuts  $E''$ , with which the stuffing-box  $E$  is held rigidly in position.

In the upper part of stuffing-box  $E$  is the tapering recess  $E^3$ , for the reception of the ta-

pering metallic packing-ring  $f$ , to be more fully hereinafter described. Below this recess  $E^3$  for a short distance the opening for the piston-rod is of a diameter equal to that of the piston-rod, and beyond that and extending below the flange  $E'$  of the stuffing-box is the cylindrical chamber  $E^4$ , somewhat larger in diameter than the piston-rod, and intended for the reception of the usual hemp or other flexible packing,  $g$ . This flexible packing  $g$  is compressed and held in place by the gland  $h$ , which is in turn adjustably secured to the stuffing-box  $E$  by the fastening bolts and nuts  $h'$ , which pass through the annular flange  $h''$  and into the walls of the cylindrical chamber  $E^4$ .

The tapering metallic packing-ring  $f$  is operated within the chamber  $d$  by the annular disk  $k$ , which surrounds the piston-rod  $a$ , and is pressed down upon the ring  $f$ , as desired, by the regulating-bolts  $l$ , (three or more,) located in the upper wall of the chamber  $d$ .

The packing-ring  $f$ , clearly shown in Figs. 2, 3, and 4 is constructed as follows: It is first cast from iron or other hard metal with a cylindrical interior chamber for the reception of the piston-rod, around which it is placed, and the outer conical or tapering surface,  $f'$ . It is then cut through its entire length and thickness upon one side, as at  $f^2$ , after which a series of longitudinal slots,  $f^3$ , are formed which extend nearly but not quite to its lower end.  $f^4$  are a series of annular slots, the lower one being located at the lower end of the longitudinal slots  $f^3$ . The packing-ring is then placed in a suitable mold and a soft flexible metal—such as lead or Babbitt metal—is poured around the packing-ring until the longitudinal and annular slots  $f^3$  and  $f^4$  and the space  $f^2$  are completely filled, thus forming a solid packing-ring of hard and soft metal, which is afterward turned down to the required size and configuration. The packing-ring thus formed has a hard durable metal surface presented to the piston-rod, and is more or less flexible by reason of the longitudinal slots  $f^3$ , filled with soft metal, and is susceptible of diminution in size, as its inner surface wears away by reason of the layer of soft metal

in the space  $f^2$ , which, as the ring is forced down by the disk  $k$  and the regulating-bolts  $l$ , is susceptible of considerable compression.

I claim—

5 1. In a stuffing-box, a flexible tapering packing-ring of hard metal, having an opening in its side wall and a series of slots cut in its tapering surface, all filled in with soft metal, as and for the purpose stated.

10 2. In a stuffing-box, the flexible tapering

packing-ring  $f, f'$ , of hard metal, having the slots  $f^3$  and  $f^4$  and opening  $f^2$ , filled in with soft metal, as and for the purpose stated.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER T. BALLANTINE.

Witnesses:

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W. T. MILLER.