

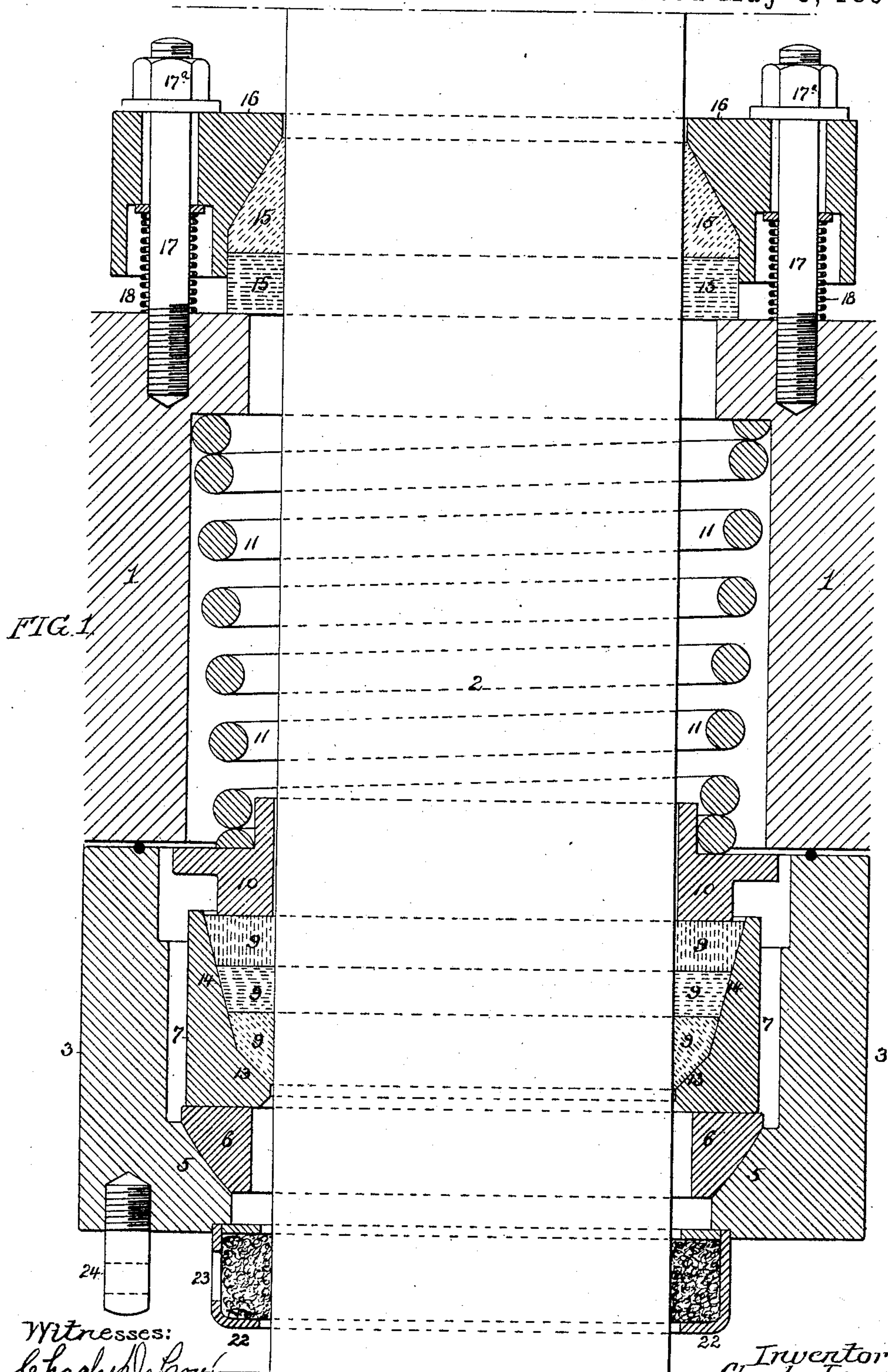
(No Model.)

3 Sheets—Sheet 1.

C. LONGSTRETH.
ROD PACKING FOR STEAM ENGINES.

No. 603,588.

Patented May 3, 1898.



Witnesses:
Charles De Bow.
F. E. Bechtold

Inventor:
Charles Longstreth
by his Attorneys,
Howson & Howson

(No Model.)

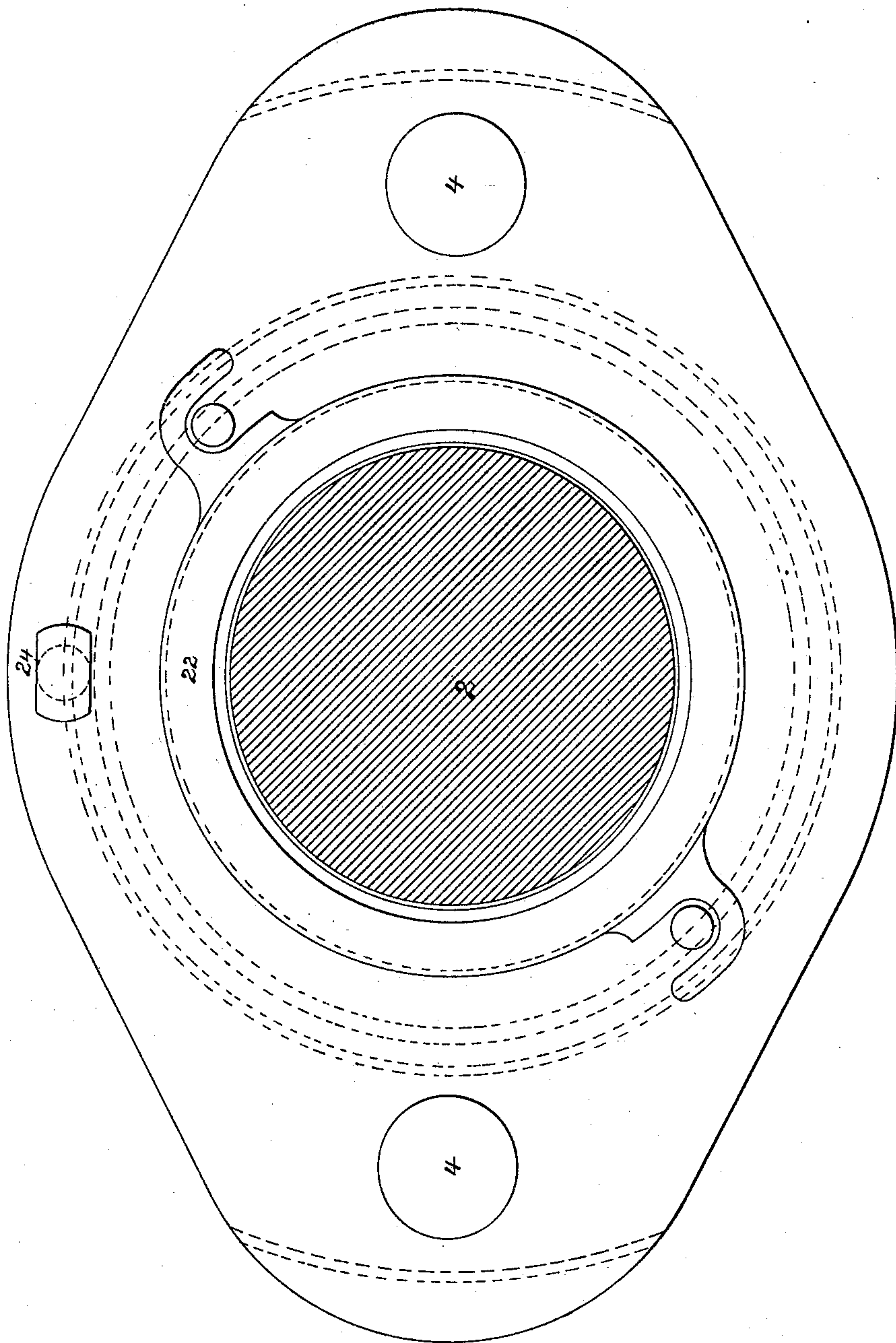
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FIG. 2.



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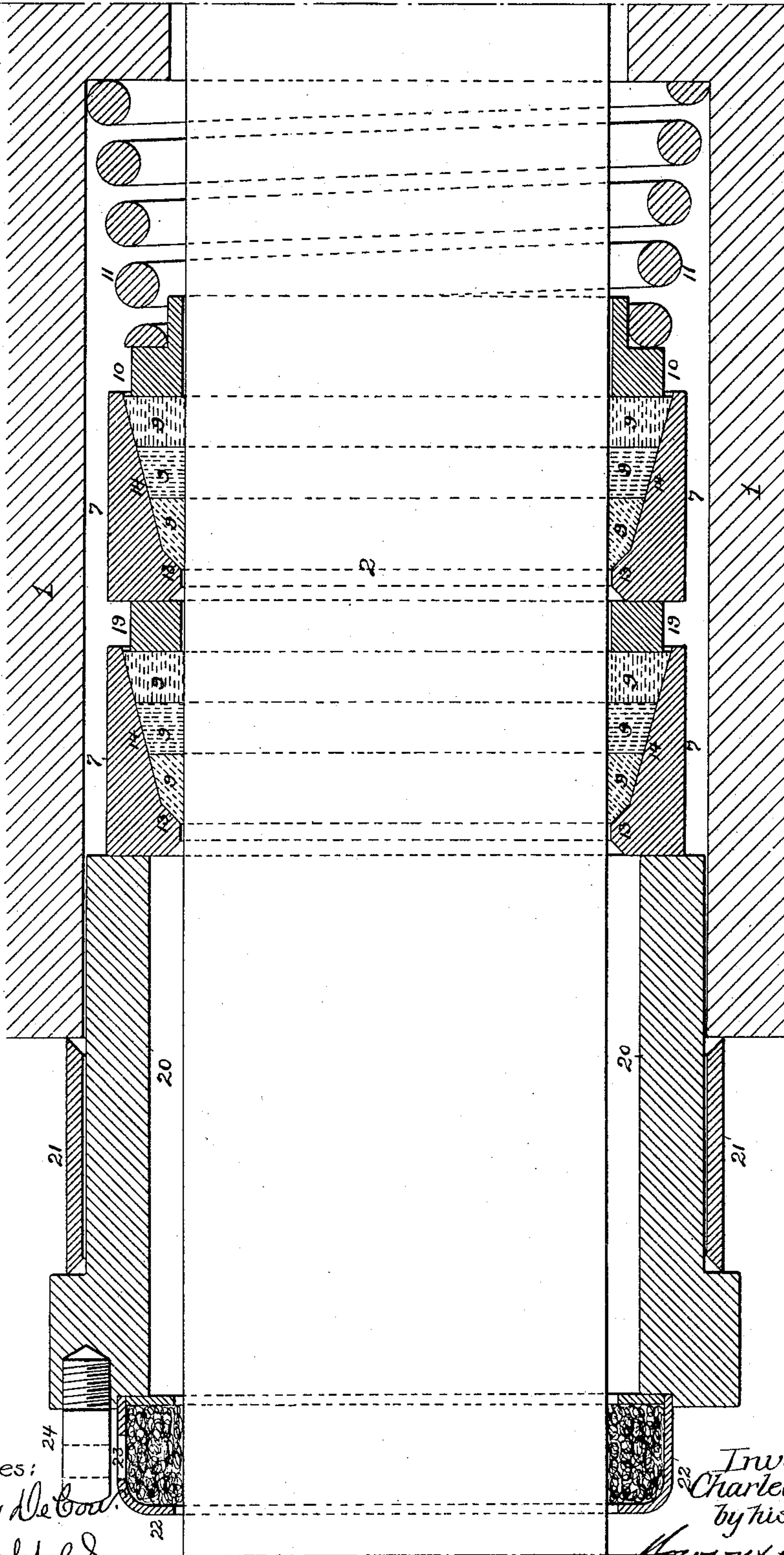
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FIG. 3.



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UNITED STATES PATENT OFFICE.

CHARLES LONGSTRETH, OF YEADON, PENNSYLVANIA, ASSIGNOR TO THE UNITED STATES METALLIC PACKING COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

ROD-PACKING FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 603,588, dated May 3, 1898.

Application filed November 8, 1897. Serial No. 657,722. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LONGSTRETH, a citizen of the United States, and a resident of Yeadon borough, Delaware county, Pennsylvania, have invented certain Improvements in Rod-Packings for Steam-Engines, &c., of which the following is a specification.

One object of my invention is to provide an efficient form of Babbitt or other soft metal packing for the piston-rods or valve-rods of steam-engines, pumps, and the like, a further object being to prevent access of water from the cylinder to the gland containing the rod-packing. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of sufficient of a steam-engine to illustrate my invention. Fig. 2 is an end view of the same with the piston-rod in section, and Fig. 3 is a longitudinal sectional view illustrating a special form of packing.

Part of the cylinder-head of an engine is represented at 1 in Fig. 1 and part of the piston-rod at 2, a gland 3 for containing the soft-metal packing-rings being applied to the outer face of the cylinder-head 1 and being secured thereto by nuts applied to the bolts 4, usually employed for securing the follower of the ordinary stuffing-box. To a concave seat 5 in the gland 3 is fitted the convex face of a ring 6, and upon the inner face of the latter bears the outer face of an annular box or casing 7, which carries the soft-metal packing-rings 9, the latter being of the usual split or segmental character, so that they can be compressed upon the rod 2.

Bearing upon the innermost of the packing-rings 9 is an annular follower 10, which is acted upon by a coiled spring 11, contained in the recess of the cylinder-head, which in an ordinary stuffing-box contains the fibrous packing-rings and follower.

The recess formed in the casing 7 for the reception of the packing-rings 9 has a beveled outer wall, the bevel presenting two different angles of inclination in respect to the surface of the piston-rod—that is to say, the angle of the beveled wall of the forward portion 13 of the recess is less acute than the angle of

the bevel throughout the remaining portion 14 of the recess. Hence as the packing-rings are forced forward in the recess of the casing 7 by the pressure of the spring and of the steam or other fluid upon the follower 10 the forward ring, or that portion of it which is subjected to the wedging action of the beveled wall 13 of the casing, is forced inward against the piston-rod with greater force than those rings or portions of rings which are subjected to the wedging action of the beveled wall 14. Hence there is such a tight hold of the forward packing-ring upon the rod 2 that any steam which may leak between said rod and the inner packing-rings is effectually stopped by said outer ring.

By the use of the casing 7, having a recess with differentially-beveled wall, I am enabled to secure the desired abrupt wedging effect upon the outer ring of the series without any sudden or abrupt change of angle, and am also enabled to impart a contracting pressure to all of the rings as they are forced forwardly in the casing 7, thus overcoming certain objections to structures of this character which have formerly been used and in which the casing had a recess with wall partially parallel with the surface of the rod and partially inclined in respect thereto.

If desired, the bevel of the wall of the recess in the casing 7 may present three or more different angles instead of but two, and there may be but a single packing-ring 9 instead of a series of such rings.

When engines are being run at full boiler capacity, it frequently happens that large quantities of water are carried over into the cylinders with the steam, and if this water escapes from the cylinder into the stuffing-box it acts with a ramming effect upon the soft-metal packing and rapidly destroys the same. For this reason I apply to the rod 2 an inside packing, which will have the effect of preventing the escape of water around said rod and of throwing it away from the rod toward the sides of the cylinder. This internal packing consists in the present instance of a pair of rings 15, applied to the inner face of the cylinder-head and contained within a bevel-walled recess in an annular casing 16,

which is mounted upon springs 18, surrounding bolts 17, which project inwardly from the cylinder-head and pass through openings in said casing 16, nuts 17^a, applied to the inner
 5 ends of the bolts, limiting the inward movement of the casing under the action of the springs, which will uphold the casing 16 against the pressure of steam to which it is subjected. When in this innermost position,
 10 the beveled wall of the recess in the casing 16 does not compress the rings 15 upon the rod; but when there is a downward rush or pressure of water upon the casing the same will yield, the springs 18 will be compressed,
 15 and the rings 15 will be forced tightly against the rod and cylinder-head, the escape of water from the cylinder being thereby prevented.

In applying my invention to cylinders having long stuffing-box casings I sometimes use
 20 a series of casings 7 with internal soft-metal packing-rings, as shown in Fig. 3, in which two of said casings 7 are illustrated, a ring 19 being interposed between the forward end of
 25 the inner casing 7 and the innermost packing-ring 9 of the outer casing 7, so as to transmit pressure, the outer casing being acted upon by a follower 20 and the escape of steam around said follower being prevented by
 30 means of an outer ring 21, having sharpened edges, one of which impinges upon or bites into the outer face of the cylinder-head or stuffing-box casing, while the other impinges upon or bites into the flange or follower 20,
 35 so as to form a steam-tight joint at both points.

The ring 19 may, if desired, constitute an annular flange projecting from the front end of the casing 7; but the separate ring is preferred.
 40

To the outer end of the gland 3 (shown in Fig. 1) and also to the outer end of the follower 20 (shown in Fig. 3) is applied a casing 22 for containing lubricant for the piston-rod—such, for instance, as oil-saturated
 45 waste—this casing having on one side an opening 23, through which oil may be supplied to the contents of the casing, the gland or follower having a projecting stud 24, located immediately in line with this opening and perforated for the reception of a pipe, whereby
 50 oil may be fed to the contents of the casing either continuously or at desired intervals.

Having thus described my invention, I

claim and desire to secure by Letters Patent—

1. The combination of a rod, one or more soft-metal packing-rings surrounding the same, a casing having a recess which receives said ring or rings and has an outer wall presenting different degrees of bevel, the forward bevel being the more abrupt, and provision for pressing the packing ring or rings forwardly in said recess, the forward ring being of considerably greater width than the abruptly-inclined portion of the wall of the casing substantially as specified.

2. The combination of a cylinder and piston-rod with an outer set of packings for said rod, and an inner packing which is pressed against a forward seat by the impact of water in the forward end of the cylinder, substantially as specified.

3. The combination of a cylinder and piston-rod, with packing for the latter located within the cylinder and consisting of a ring or rings surrounding the rod, and a spring-supported casing surrounding said rings and having a beveled face for compressing the same when it is moved forwardly against the action of the spring-support, substantially as specified.

4. The combination of a cylinder and piston-rod, with an outer set of packing-rings for the said rod, and an inner packing bearing against a forward seat and contained in a beveled recess in a sleeve which is acted upon by the impact of water in the forward end of the cylinder, whereby packing-rings are pressed both against the forward seat and against the rod.

5. The combination of a rod and a cylinder-head or other structure having a recess therein, a series of casings contained within said recess and each containing a series of packing-rings, a ring whereby pressure is transmitted from each casing to the packing-rings contained in the casing in advance, a spring-actuated follower for pressing upon the inner ring of the inner casing, and a follower for pressing upon the outer casing of the series, substantially as specified.

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

CHARLES LONGSTRETH.

Witnesses:

F. E. BECHTOLD,
 JOS. H. KLEIN.