(No Model.) 3 Sheets—Sheet 1.

F. E. SMALL.

METALLIC PACKING.

No. 558,220. Patented Apr. 14, 1896.

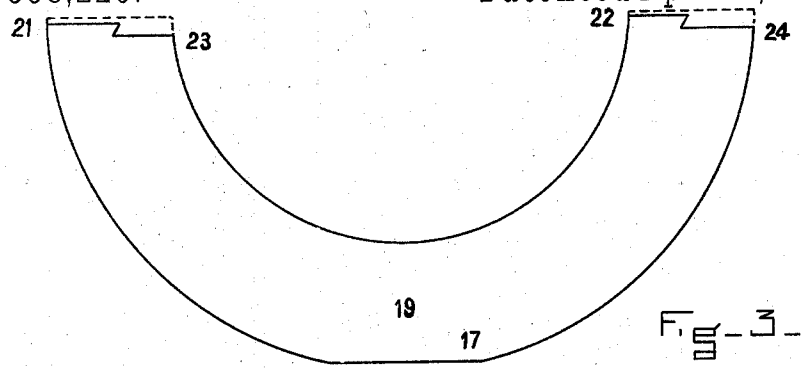

Fig. 3.

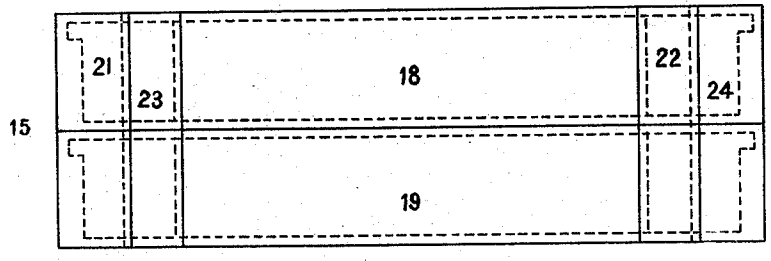

Fig. 2.

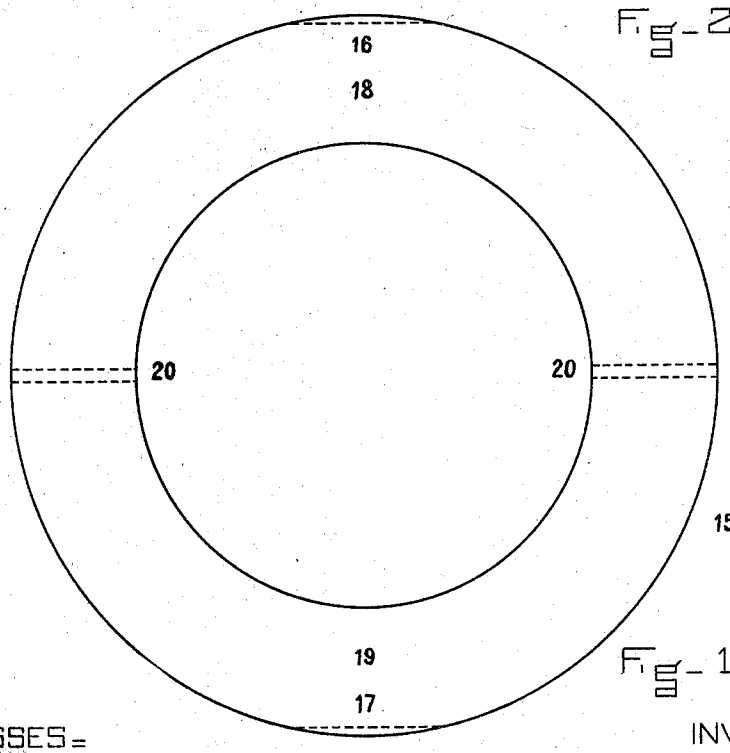

Fig. 1.

WITNESSES=
George E. Dolbeare.
Robert H. Orr

INVENTOR.
Frederick E. Small.
BY
E. Frank. Woodbury.
ATTORNEY.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

(No Model.) 3 Sheets—Sheet 2

F. E. SMALL.

METALLIC PACKING.

No. 558,220. Patented Apr. 14, 1896.

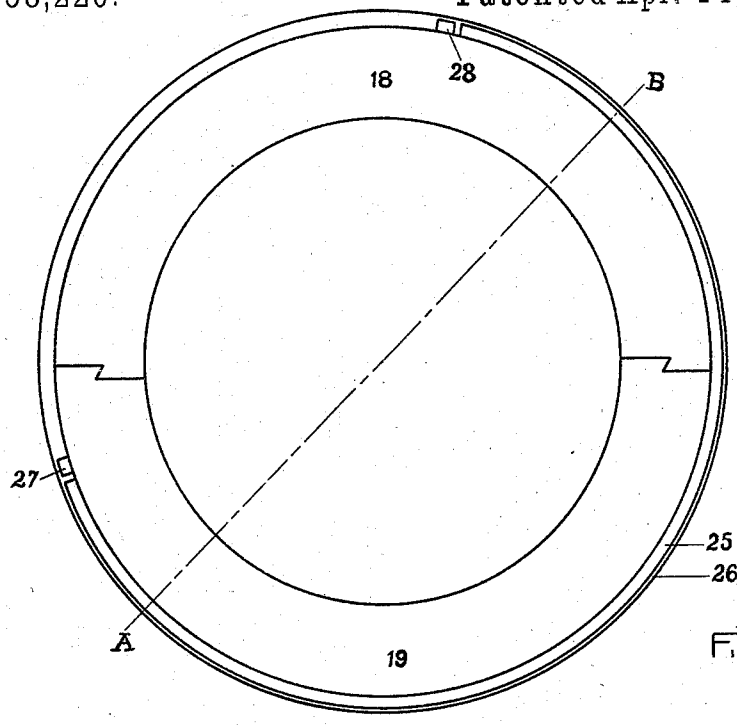

Fig. 5.

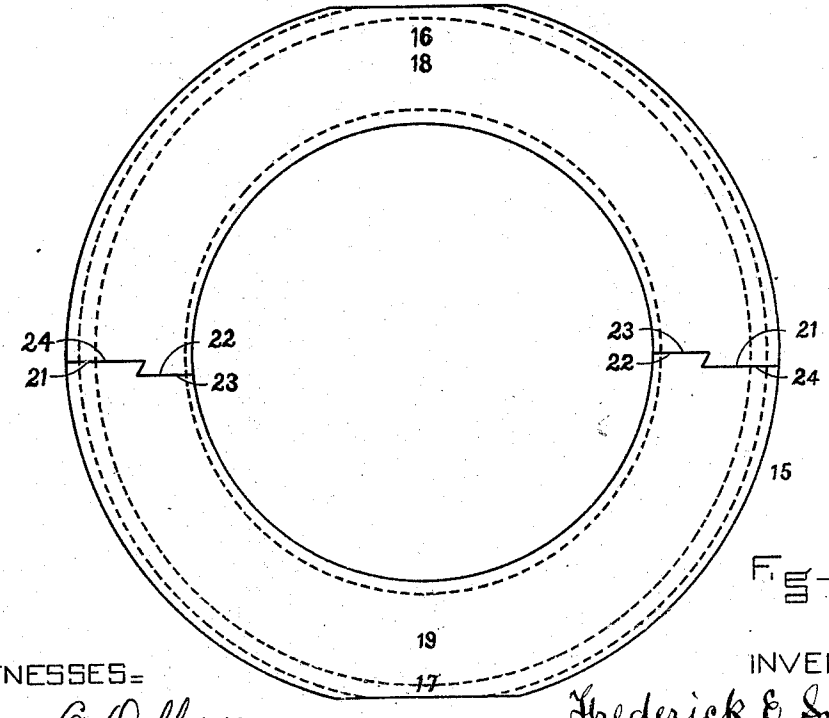

Fig. 4.

WITNESSES=
George L. Dolbeare.
Robert H. Orr.

INVENTOR.
Frederick E. Small.
BY
E. Frank. Woodbury.
ATTORNEY.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

(No Model.) 3 Sheets—Sheet 3.

F. E. SMALL.

METALLIC PACKING.

No. 558,220. Patented Apr. 14, 1896.

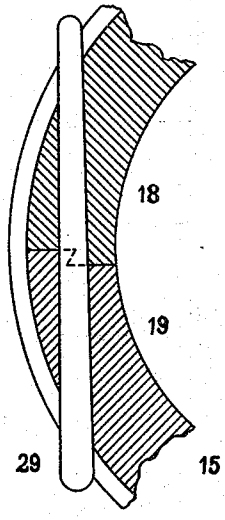

Fig. 8.

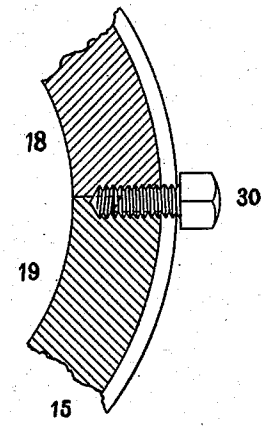

Fig. 9.

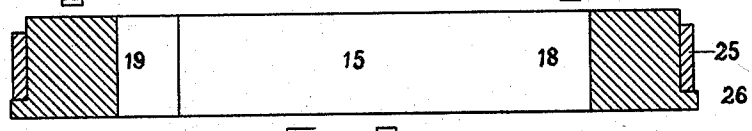

Fig. 6.

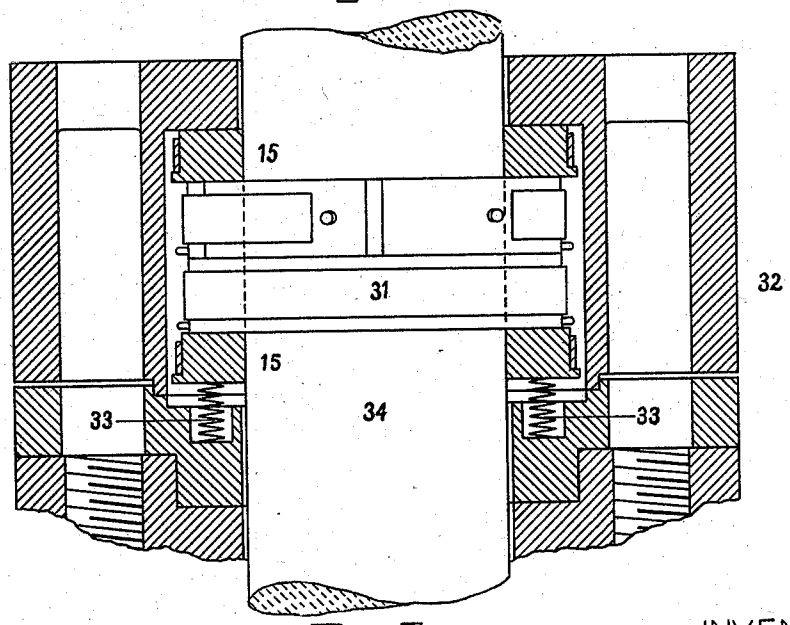

Fig. 7.

WITNESSES=
George L. Dolbeare
Robert H. Ourand

INVENTOR.
Frederick E. Small.
BY E. Frank. Woodbury.
ATTORNEY.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

FREDERICK E. SMALL, OF BOSTON, MASSACHUSETTS.

METALLIC PACKING.

SPECIFICATION forming part of Letters Patent No. 558,220, dated April 14, 1896.

Application filed September 21, 1895. Serial No. 563,241. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK E. SMALL, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Metallic Packing, of which the following is a specification.

My invention relates to metallic packings for the piston-rods and for the valve-rods of steam-engines and for other like purposes.

It has for its object the special construction of the rings which are commonly included in a metallic packing as a portion thereof. Two of the rings usually go with each packing. One is commonly designated the "sliding" ring and the other the "follower" ring, both rings being of substantially the same construction. Each ring is so constructed that it may be applied to a piston-rod without disconnecting the rod from its cross-head. This feature is of particular value in applying metallic packings to rods of large diameters, as it is a formidable and expensive matter to disconnect a piston-rod of large diameter from its cross-head. It is also very convenient to be able to apply the rings, without slipping them over the end of the rod, to piston-rods of tandem engines, especially to the piston-rod between the cylinders. The special construction of the ring is such that, while the efficiency of a finely-made dovetailed joint is insured, the novel construction of the joint is such as to permit its ready manufacture at a very low cost.

Figure 1 represents in side elevation one of the rings in its rough-turned state. Fig. 2 is a plan of the halves of the ring shown in Fig. 1 placed side by side. Fig. 3 is a side elevation of the halves of the ring shown in Fig. 2. Fig. 4 represents in side elevation the halves of the ring shown in Figs. 2 and 3 put together. Fig. 5 represents the ring in side elevation put together complete. Fig. 6 is a sectional view of Fig. 5 on line A B. Fig. 7 represents in partial section and elevation the application of the rings to the piston-rod of an engine in connection with a well-known make of metallic packing. Fig. 8 illustrates a mode of fastening the dovetailed joint, using for that purpose a taper-pin, and Fig. 9 illustrates the use of a set-screw as a means of locking or securing the dovetailed joint.

The process of manufacture of the rings is illustrated by the full-size views, Figs. 1, 2, 3, 4, 5, and 6. The manufacture of a ring provided with the usual dovetailed joint would be attended by a prohibitive cost, but a ring made in accordance with my invention can be produced at an exceedingly low cost.

The rings should be made of such a material or materials as may be best suited to the uses for which they are designed.

The divided ring 15 (shown by Fig. 1) having a rectangular cross-section is first rough-finished down to the size, as shown, then it is flattened slightly at the opposite points 16 and 17, so that the halves of the rings will stand square when put in a milling-machine. Then the ring is cut into the two equal parts 18 and 19 by means of the cut 20. (Shown by dotted lines.) The halves of the ring 18 and 19 are then placed side by side, as represented by Figs. 2 and 3, and the joint-cuts 21 and 22 and 23 and 24 are made in a milling-machine using suitable cutters. The joint-cuts 21 and 22 are made on the same level. So also, in a similar manner, are made the cuts 23 and 24. It will be observed that any number of halves of rings of the same size, up to the capacity of the milling-machine to receive them, may be milled at the same time. It will be seen that these cuts may be easily, correctly, and quickly made.

In Fig. 2 the cross-sectional areas of the finished joint ends of the ring are represented by dotted lines. In the next operation, as illustrated by Fig. 4, the halves of the ring are jointed or put together, and the ring is then turned, bored, planed, and finished, as per dotted lines, and the complete finished ring will then be as shown by Figs. 5 and 6, the ring being fitted with the spring 25, which tends to keep the joints pressed together. The annular lip 26 and the pins 27 and 28 are provided for the purpose of keeping the spring in its correct position.

If it is desired to hold the ring in a manner stronger than it is possible to hold it together by means of the spring, the taper-pin 29 may be used in a manner shown by Fig. 8, or the set-screw 30 may be used, as illustrated by Fig. 9.

In operation the rings, as shown upon a reduced scale by Fig. 7, are used, in connection with the metallic packing 31, in the following manner: One of the rings 15 serves as the sliding ring between the packing 31 and the gland 32, which may be made in halves in the same manner as the rings, if desirable, and the other ring 15 serves as a follower-ring between the packing 31 and the follower-springs 33. It is obvious that when the rings 15 are placed upon the piston-rod 34 the rod serves as a lock against the removal of either half of either of the rings, except in lines parallel with the longitudinal axis of the piston-rod.

It will be observed that the two sections of the ring when placed around a rod make joints that resist pulling the ring apart in all directions except one—namely, in the direction of the length of the rod—the rod operating to lock the sections against lateral movement. At the same time each of the two joints is made up having one angle-fit only (that can be readily made) instead of the usual flaring tongue of the common dovetailed joint, that is very difficult to make.

I claim as my invention—

In a metallic rod-packing, the combination of a metallic packing, and loose sliding and follower rings disposed at opposite ends of the packing, said loose rings being composed of sections united with single-angle dovetail joints, and springs on said loose rings, the spring on each ring operating to hold the sections thereof always in close contact at the joints and prevent lateral movement of one section on the other.

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

FREDERICK E. SMALL.

Witnesses:

E. FRANK WOODBURY,

ROBERT H. ORR.