CHARLES S. BARRY.

Improvement in Metallic Piston-Rod Packing.

No. 127,834. Patented June 11, 1872.

Fig. 1

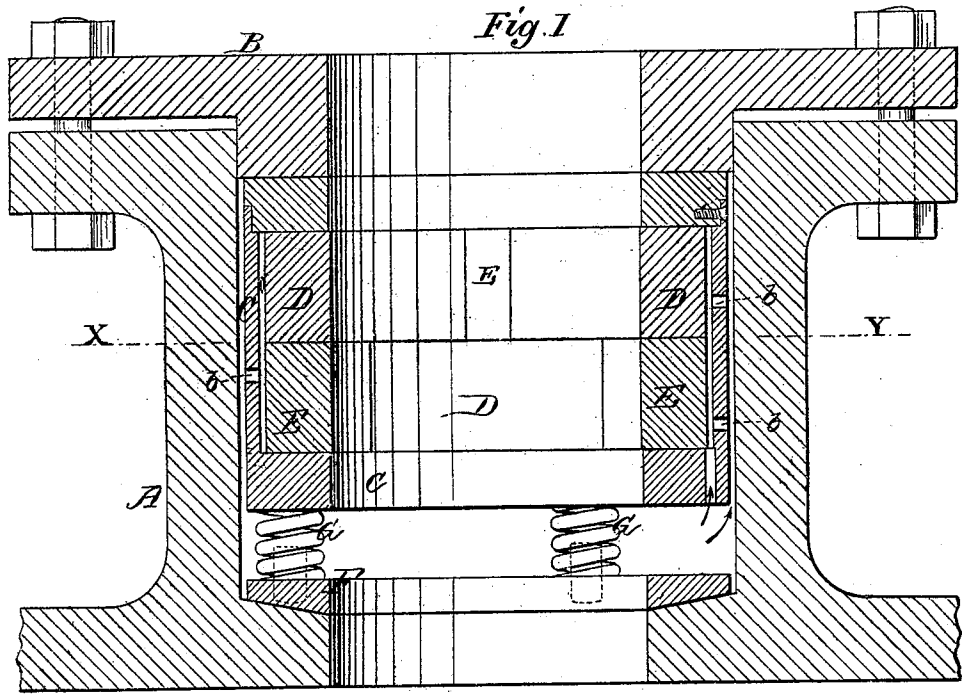


Fig. 2.

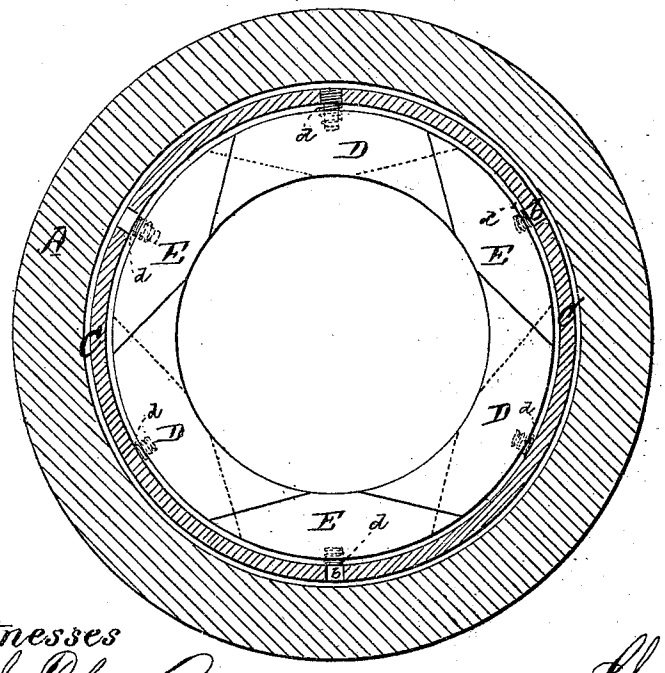
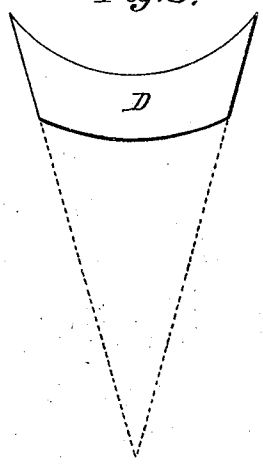


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES S. BARRY, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO HENRY BLUNDELL, AGENT, OF SAME PLACE.

IMPROVEMENT IN METALLIC PISTON-ROD PACKINGS.

Specification forming part of Letters Patent No. 127,834, dated June 11, 1872.

To all whom it may concern:

Be it known that I, CHARLES S. BARRY, of the city and county of Providence, in the State of Rhode Island, have invented a certain new and useful Improvement in Metallic Piston-Rod Packing.

My improvement relates to that class of segmental metallic piston-rod packing in which the pressure of steam on the outer peripherical surfaces of the segments induces packing contact with the rod; and it consists in combining in one or more series several main segmental sections, which are fitted to the rod and nearly surround it, with slight breaks between the sections, and also several auxiliary sections, which are located in the spaces between the ends of the main sections, and which are fitted to bear upon the rod only at such points as are not covered by the main sections; and also in so forming the abutting ends of the main and auxiliary sections that, while force exercised on the periphery of the main sections by the pressure of steam will induce a free inward radial pressure against the rod, a similar force upon the peripherical surfaces of the auxiliary sections will not only induce in them an inward radial pressure, but also cause them to force the main sections inward against the rod with an additional degree of pressure nearly equal to that received by them direct from the pressure exercised by the steam against their own peripheries; and I do hereby declare that the following specification, taken in connection with the drawing furnished and forming a part of the same, is a clear, true, and exact description of a rod-packing involving the several and combined features of my invention.

Referring to the drawing, Figure 1 represents one of my rod-packings in central vertical section, as if in position within the gland of an upright engine. Fig. 2 represents the same in horizontal section on the line X Y, between the series of segmental sections, and exhibits the configuration of each section. Fig. 3 represents one of the main segmental sections, with the lines at the ends extended for the purposes of illustration.

A denotes the gland of the cylinder-head. B denotes the follower or cap, which is to be secured to the face of the gland by any of the well-known means. C denotes the box or case which contains the packing. One end is cast with a flange, which extends nearly to the circumferential line of the rod; the other end is provided with a cover similar in character to the flange, but provided with means for attachment to the case. Numerous ports, *b*, are provided for the free admission of steam through the case. D denotes one of several main segmental sections, of peculiar form. In this instance six of them are presented in two equal series. They may be properly described as segmental sections of a metallic ring, having the requisite amount of metal between the inner circumference and the periphery, and differ only from others of similar character in their peculiar form. Their inner curved bearing-surfaces are longer than their outer peripherical surfaces, and their ends are jointed off on lines which approach each other as they advance from the inner or bearing circumferential line. These end lines, if extended, would meet at a short distance therefrom, and form an acute-angled or isosceles triangle, of which the curved inner bearing or packing line would constitute the base, as illustrated in Fig. 3. The length of the peripherical line of each section compares with that of the interior line as, say, two compares with two and three-quarters, respectively. E denotes one of several auxiliary segmental sections. They occupy positions between the ends of the main sections, and maintain, when in position, a circumferential unity from section to section. They are so formed that they present but a small surface for contact with the piston-rod. Their ends are jointed at such acute angles as will cause them to correspond with the ends of the main sections. The peripheries of these auxiliary sections are longer than the interior bearing-surface in a proportion, as shown, of, say, two and three-quarters to one-half of one. Each of the several main and auxiliary segments is provided with an expansive spring, *d*, which, by bearing against the interior of the case C, causes the segments to be held in their proper relative position during the reaction resulting from vacuum in the cylinder, as in a condensing-engine. Each section may also be provided with loosely-fitted dowels, entering through the walls of the case, for pre-

venting them from turning therein. F denotes a collar, which is fitted loosely to the inner end of the gland, and serves as a base, from which the springs G press against the inner end of the packing-case and keep its outer end firmly against the follower. As usual in such cases, the eye of the follower should be larger than the rod, and the interior of the gland larger than the box which contains the packing, in order that some slight play will be possible in case of any slight bend in the piston-rod, or of any slight undue movement other than the longitudinal. Pressure of steam on the outer or peripherical surfaces of the several main segments D freely induces them to exercise an inward pressure on radial lines. Similar pressure on the peripherical surfaces of the auxiliary sections E not only causes them to exert an inward pressure against that portion of the rod with which they are in contact, but also causes the main sections to press inward with greater force than they could if dependent wholly upon the pressure of steam against their own peripheries. This is occasioned by the peculiar construction of the abutting ends of the sections. As a means of illustration, the main sections will be compared to wedges, with their small ends projecting outward from a common center, and the auxiliary section will be compared to wedges in a reversed position, with their small ends projecting inward toward a common center. Pressure applied to these latter wedges at their bases must of necessity not only move them inward slightly, but also move the others inward, and with a much more rapid movement. So in practice my segments are always held with proper packing relation against the rod, and so continue as long as sufficient metal remains to constitute a practical packing.

In arranging two or more series of segments the joints between the main and auxiliary segments of one series should be "broken" by those of the next series in a manner well known. It will be readily observed that the joints between the several sections are also kept closed by the pressure of steam, and that as the segments wear away next to the rod they will close in upon it, and maintain the same practical relation to it and to each other until worn out.

I am aware that metallic piston-rod packings have long been in use in which steam has been employed as the compressing agent, and that the segments of such have been formed in many ways; but I know of none prior to my invention in which main packing segmental sections were so combined with auxiliary sections that the latter not only rendered service by assisting in packing with the rod, but also rendered important service in causing the main sections to operate more efficiently by forcing them against the piston-rod.

I claim as new and as my own invention—

1. The combination, within a suitable case or piston-rod stuffing-box, of the main segmental metallic sections D and the auxiliary segmental sections E, arranged in one or more separate series, fitted so as to wholly embrace the piston-rod with a packing-surface, and jointed, one section with the other, throughout each series, substantially as described, so that a general or special peripherical pressure against the segments will be utilized principally by the main sections, whether the pressure be exercised directly against them or against the auxiliary sections.

2. The combination, with a gland and an interior packing-case, provided with ports and openings for the passage of steam from the gland into the case, of the segmental sections D and E in one or more series and jointed, substantially as and for the purposes specified.

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Witnesses:

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