

No. 607,077.

Patented July 12, 1898.

F. H. RAMSDELL.
PISTON PACKING.

(Application filed Mar. 16, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

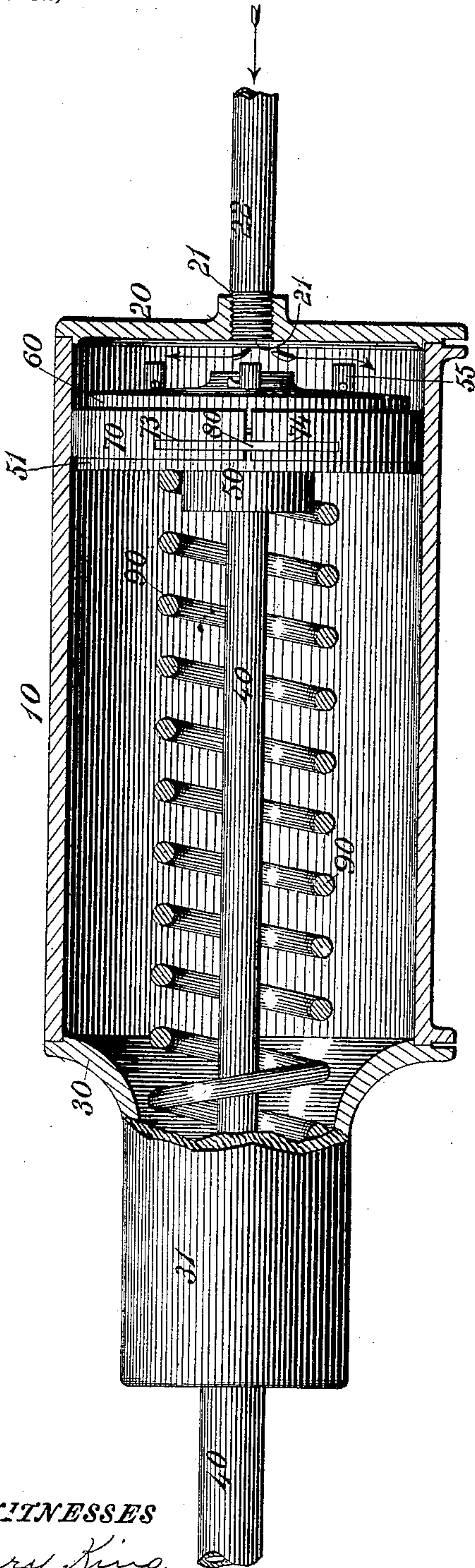


Fig. 5.

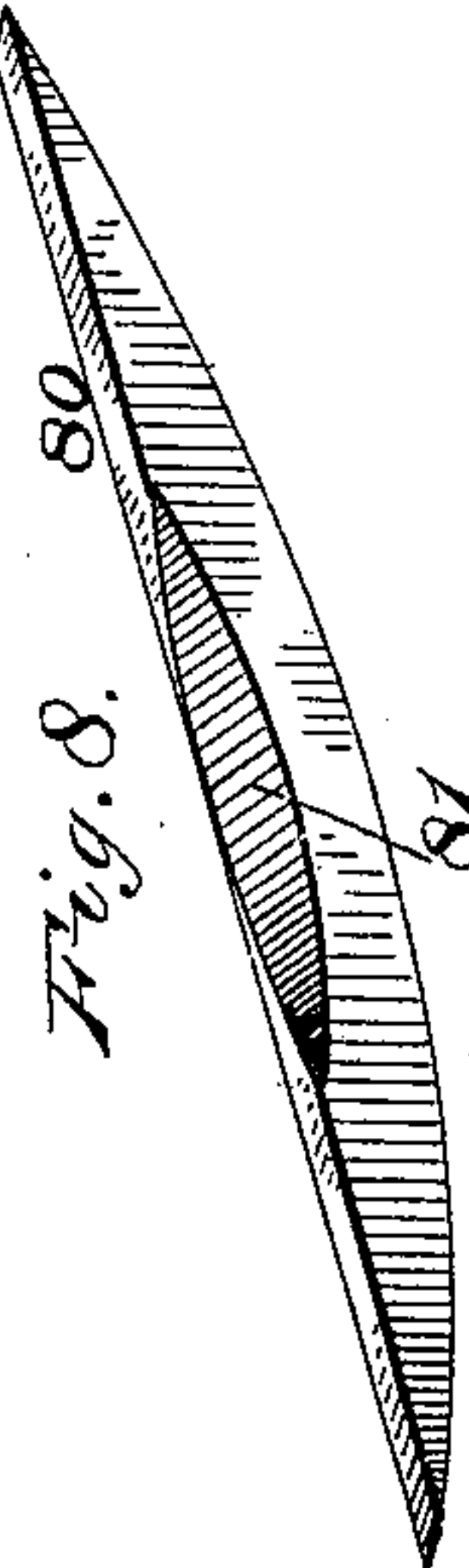
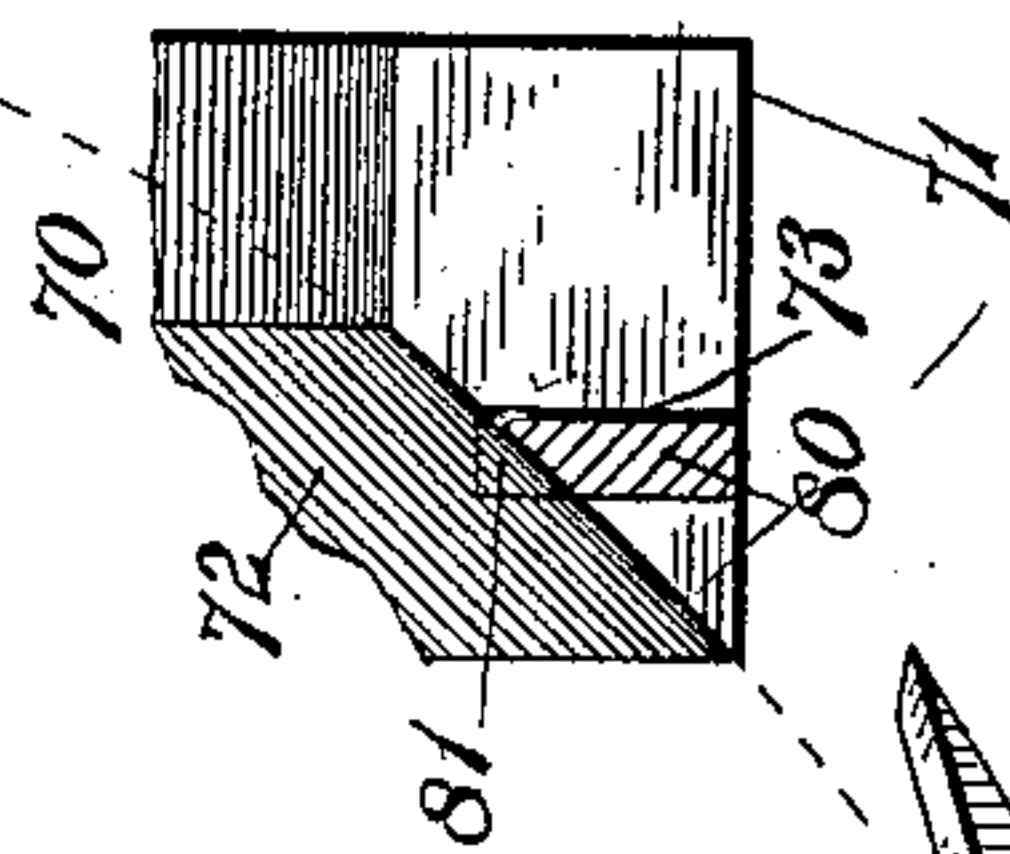
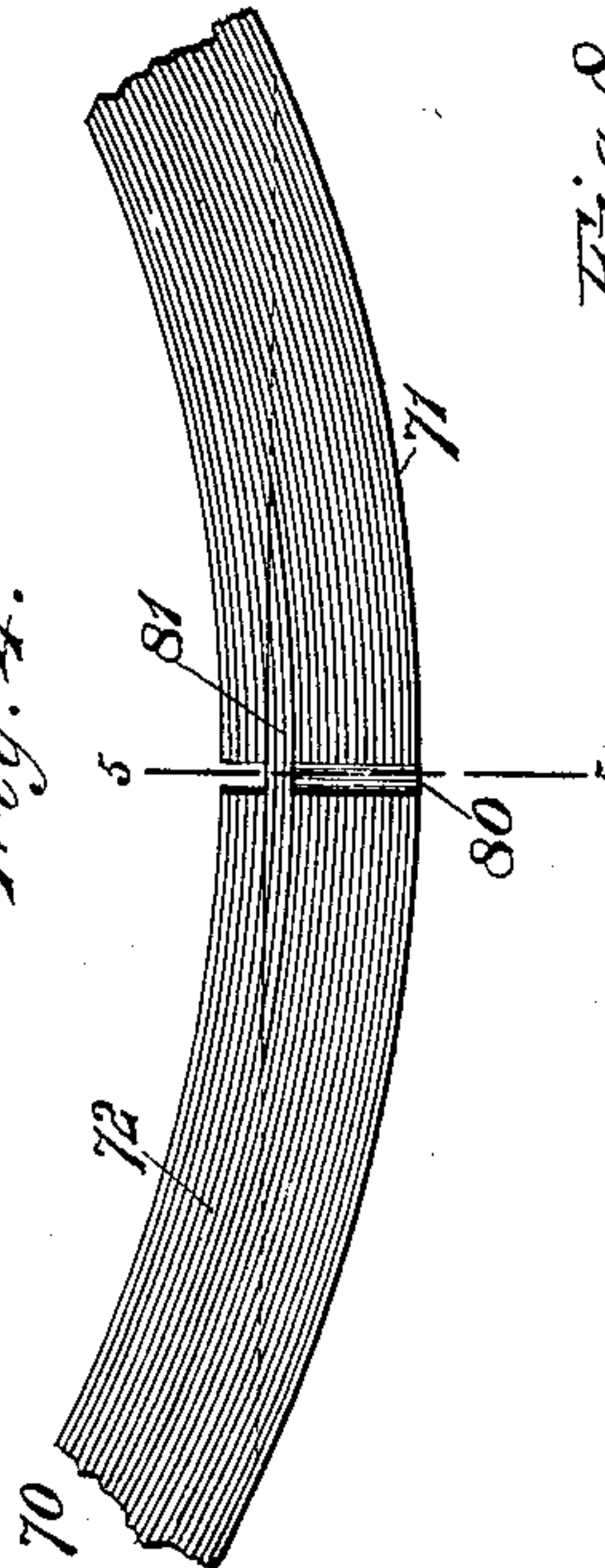


Fig. 4.



WITNESSES

Harry King
H. S. Hill

INVENTOR

Fred H. Ramsdell
By *J. C. Jones*
Attorney

No. 607,077.

Patented July 12, 1898.

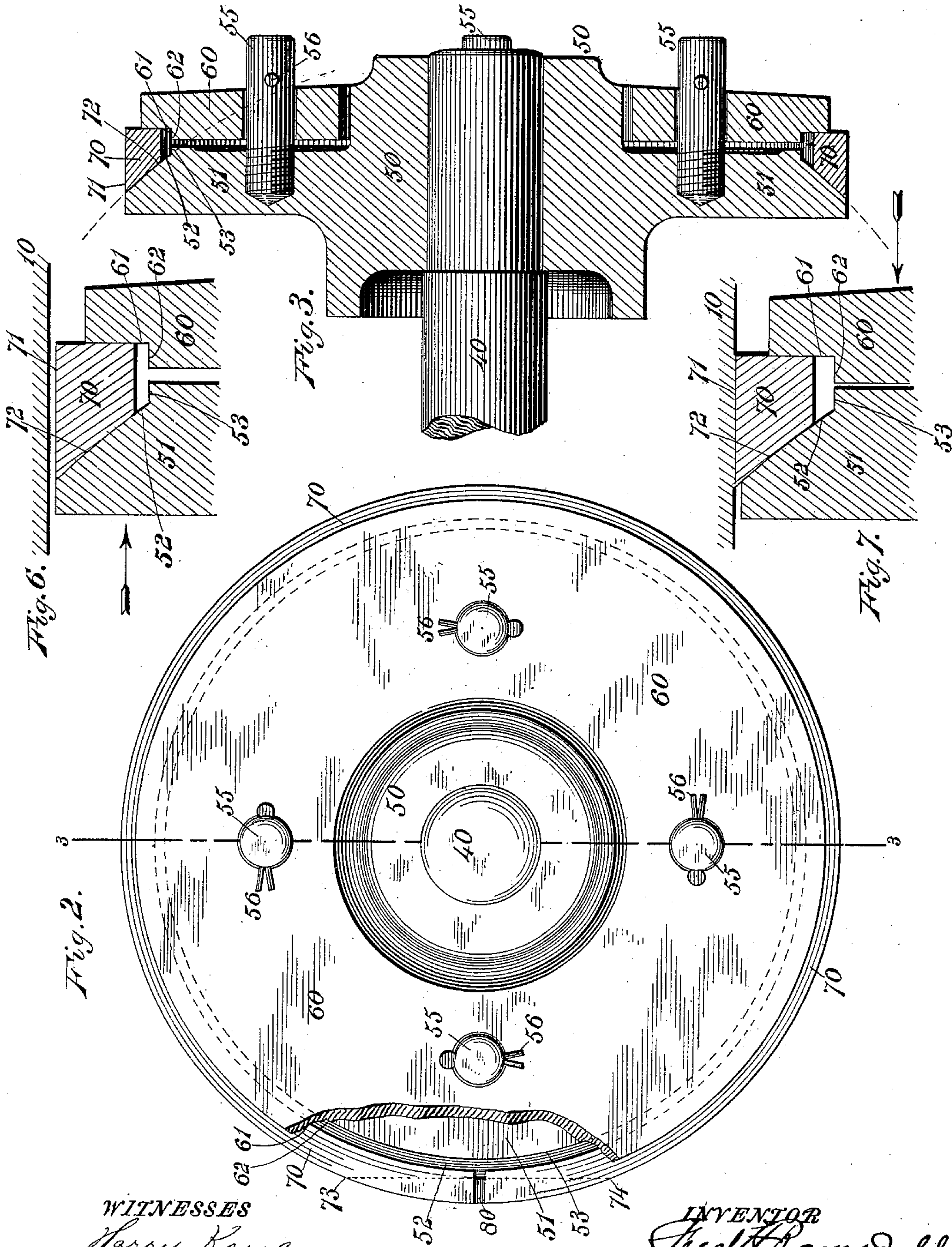
F. H. RAMSDELL.

PISTON PACKING.

(Application filed Mar. 16, 1898.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES

Harry King.
H. S. Hise.

INVENTOR

Frederick Ramsdell
By J. B. Jones
Attorney

UNITED STATES PATENT OFFICE.

FRED HEALD RAMSDELL, OF MELROSE, MASSACHUSETTS, ASSIGNOR OF
ONE-HALF TO GUY E. MITCHELL, OF MEDFORD, MASSACHUSETTS.

PISTON-PACKING.

SPECIFICATION forming part of Letters Patent No. 607,077, dated July 12, 1898.

Application filed March 16, 1898. Serial No. 674,086. (No model.)

To all whom it may concern:

Be it known that I, FRED HEALD RAMSDELL, a citizen of the United States of America, residing at Melrose, in the county of Middlesex, in the State of Massachusetts, have invented certain new and useful Improvements in Piston-Packings, of which the following is a specification.

This invention relates to packings for pistons for air-cylinders, steam-cylinders, or other purposes.

The object of the invention is to provide a piston-packing which will be simple, effective, economical, and durable.

The invention is herein illustrated in simple form applied to a brake-cylinder for a railway-train brake in which the fluid-pressure is applied on one side only of the piston and in which the packing is required to be operated during the stroke in one direction only. The example also shows it applied to an expansible piston-packing which is caused to expand laterally and form a close joint against the bore of the cylinder by the pressure on one side of the piston during its stroke in one direction and which contracts automatically to avoid friction, resistance, and wear during the stroke of the piston in the opposite direction.

Figure 1 of the accompanying drawings represents a vertical section of an ordinary brake-cylinder containing a piston embodying this invention. Fig. 2 represents an elevation of the front face of a piston provided with this packing, a part of the follower being broken away, showing means for closing the joint between the ends of the split packing-ring and permitting said ends to slide in the expansion and contraction of the ring. Fig. 3 represents a diametrical section of the piston on line 3 3 of Fig. 2. Fig. 4 represents, on a larger scale, a plan of a segment of the expansible packing-ring and the means for closing the sliding joint at the ends thereof.

Fig. 5 represents, also on a larger scale, a section of the packing-ring on line 5 5 of Fig. 4. Fig. 6 represents, also on a larger scale, fragments of a piston and cylinder, showing the expansible packing in contracted position, which it assumes when the piston is

moving on its back stroke. Fig. 7 represents, also on a larger scale, fragments of a piston and cylinder, the packing being in expanded position, which it assumes when the piston is moving under a pressure of air or steam. Fig. 8 represents a perspective view of the joint-closing coupling-links for the ends of the packing-ring.

The same reference-numbers indicate the same parts in all the figures.

The drawings illustrate the invention as applied to an ordinary brake-cylinder of an air-brake apparatus for railway-trains. The cylinder-body 10 is provided with a front head 20, having a central air-inlet opening 21, and with a back head 30, provided with a tubular extension 31. An air-supply pipe 22, leading from the reservoir, connects with the opening 21. A piston-rod 40 extends through the back head 30 and is provided within the cylinder with a piston 50. A release-spring 90 is interposed between the piston 50 and the back head 30 and operates in the usual manner to move the piston on its back stroke and release the brakes.

The piston 50 comprises a piston-head 51, which is fastened on the piston-rod 40 in any suitable manner. The periphery of this piston-head is beveled toward its outer face, forming a beveled resting-face 52 for the packing. This beveled face is preferably spherically convex, and in such case that part of the piston-head surrounded by this spherically-beveled face constitutes the frustum of a sphere or spheroid. An annular shoulder 53 is disposed at the inner edge of the bearing-surface 52. Guide-studs 55 extend outward from the front face of the piston-head 51. These guide-studs are united with or secured to the head in any suitable manner. In the form shown they are provided at their inner ends with screw-threads, which engage screw-threaded sockets formed in said head. These studs are provided near their outer ends with transverse split cotter-pins 56. A follower 60, provided with holes through which the guide-studs 55 pass, is disposed in front of the piston-head 51 and is adapted to slide on said guide-studs. This follower is slightly smaller in diameter than the piston-head and is pro-

vided at its inner edge with a peripheral recess 61, forming an annular shoulder 62.

A packing, preferably in the form of a ring 70, having some inherent elasticity and composed of metal or other suitable material, is disposed between the bearing-surface 52 of the piston-head 51 and the follower 60. This ring 70 is provided with a peripheral surface 71, adapted for contact with the cylinder 10 when in operative position, and with a beveled surface 72, adapted to fit said bearing-surface 52 of the piston-head 51. When the bearing-surface of the head is in the form of a spherically-convex bevel, the contact-surface of the ring is in the form of a concave spherical bevel, and a ball-and-socket joint is formed between these parts. This ring is split transversely, and in the expansion and contraction thereof the ends move toward and from each other. Any suitable means which will permit the sliding of the ends are employed for closing the joint between them against the passage of air, steam, or other fluid. The means shown for this purpose comprise a joint-closing link in the form of a segmental plate 80, preferably having a concave recess 81 at the lower corner of its inner edge. This link is set into registering slots 73 and 74 in the ends of the packing-ring. The curved outer edge of the link corresponds substantially with the periphery of the ring, and the concave recess 81 fits on the curved bearing-surface 52 of the piston-head, so that the space is completely closed from the periphery of the ring to the piston-head. The concave recess 81 enables the link to fit and move smoothly in the beveled face 52. The ends of the ring slide freely on the link.

In the use of this invention in brake-cylinders the piston is held in normal position when the brakes are off by the release-spring 90 in the usual manner, as shown in Fig. 1. In such case the expansible packing-ring 70 is in its normal contracted position, as shown in Figs. 3 and 6. In applying the brakes when the compressed air is admitted to the brake-cylinder in front of the piston 50 the follower 60 moves under the pressure thereof on the guide-studs 55 slightly toward the piston-head 51. A lateral direction is given to the pressure of the follower 60 on the ring 70 by the beveled contact-surfaces 52 and 72, whereby the ring is expanded laterally and its periphery thrown against the inner face of the cylinder, making a close joint. The packing-ring remains in this position until the operative stroke of the piston is completed. When the piston is relieved from the air-pressure, the elasticity of the ring 70 causes it to contract to normal position, and the release-spring 90 operates the piston through its back stroke and takes off the brakes.

Sometimes the piston-rod does not travel in a straight line; but owing to the ball-joint between the packing-ring and the piston-head this wobbling of the piston does not affect the efficiency of the packing.

This packing may be used in any pistons to which it is applicable whether for cylinders for air, steam, or other fluid or liquid.

I claim as my invention—

1. In a piston-packing, the combination of a piston having a spherically-convex beveled resting-face for the packing, an expansible packing surrounding said piston and having a spherically-concave beveled face fitting the spherically-beveled face of the piston, and means for pressing said packing against said convex resting-face, the convex resting-face causing said packing to expand under said pressure.

2. In a piston-packing, the combination of a piston having a spherically-convex beveled resting-face for the packing, an expansible packing surrounding said piston and having a spherically-concave beveled face fitting the spherically-beveled face of the piston, and a movable follower adapted to be exposed to the fluid-pressure on the piston for expanding said packing, and means for holding and guiding said follower.

3. In a piston-packing, the combination of a piston having a spherically-convex beveled resting-face for the packing, an expansible split packing-ring surrounding said piston and having a spherically-concave beveled face fitting the spherically-beveled face of the piston, a coupling-link forming a sliding connection between the split ends of said expansible ring, and means for expanding said ring.

4. In a piston-packing, the combination of a piston having a spherically-convex beveled resting-face for the packing, an expansible split packing-ring surrounding said piston and having a spherically-concave beveled face fitting the spherically-beveled face of the piston, a coupling-link forming a sliding connection between the split ends of said expansible ring and having a concave recess fitting said contact-face of the piston, and means for expanding said ring.

5. In a piston-packing, the combination of a piston having a spherically-convex beveled resting-face for the packing, an expansible split packing-ring surrounding said piston and having a spherically-concave beveled face fitting the spherically-beveled face of the piston, a segment-shaped link disposed in registering slots in the ends of the split ring and spanning the joint between them, said link being provided with a recess adapted to fit the beveled face of the piston-head.

6. In a piston-packing, the combination of a piston-head having a beveled resting-face for the packing, a split expansible packing-ring provided with a beveled face adapted to fit the beveled face of the piston-head, means for applying pressure to said packing-ring for expanding it into operative position, said ring contracting automatically when the pressure is released, and a link disposed in registering slots in the ends of the split ring and spanning the joint between them, said link permitting said ends to move toward and

from each other in expanding and contracting, and being provided with a recess at its inner edge which fits the beveled face of the piston-head.

5 7. In a piston-packing, the combination of a piston-head provided with guide-studs, and a beveled bearing-surface, an expansible packing provided with a beveled bearing-surface adapted to fit the bearing-surface of the
10 piston-head, and a follower adapted to move on said guide-studs for applying pressure to said packing to expand it into operative position.

8. In a piston-packing, the combination of
15 a piston-head provided with guide-studs, and a beveled bearing-surface, an expansible packing-ring provided with a beveled bearing-surface adapted to fit the bearing-surface of the piston-head, and a follower adapted to
20 move on said guide-studs for applying pressure to said packing-ring to expand it into operative position, said ring contracting automatically into inoperative position when the pressure is released.

25 9. In a piston-packing, the combination of a piston-head provided with guide-studs, and a beveled resting-face for the packing, a follower, a split expansible packing-ring disposed between said piston-head and follower
30 and provided with a beveled face adapted to fit the beveled face of the piston-head, and a link disposed in registering slots in the ends of the split ring and spanning the joint between them.

35 10. In a piston-packing, the combination of a piston-head provided with guide-studs, and

a spherically-convex beveled resting-face for the packing, a follower, a split expansible packing-ring disposed between said piston-head and follower and provided with a spherically-concave beveled face adapted to fit the beveled face of the piston-head, and a coupling-link forming a sliding connection between the split ends of said expansible ring. 40

11. In a piston-packing, the combination of
45 a piston-head provided with guide-studs, and a beveled resting-face for the packing, a follower adapted to slide on the guide-studs on said head, a split expansible packing-ring disposed between said piston-head and follower, and provided with a beveled face adapted to fit the beveled face of the piston-head, and a segment-shaped link disposed in registering slots in the ends of the split ring and spanning the joint between them, said link
50 being provided with a recess adapted to fit the beveled face of the piston-head. 55

12. In a piston-packing, the combination of a piston-head having a spherically-convex beveled resting-face for the packing, and a
60 shoulder at the inner edge thereof, an expansible split packing-ring surrounding said piston and having a spherically-concave beveled face fitting the spherically-beveled face of the piston, a coupling-link forming a sliding
65 connection between the split ends of said expansible ring, and means for expanding said ring.

FRED HEALD RAMSDELL.

Witnesses:

G. F. NOWELL,
C. R. BARNARD.