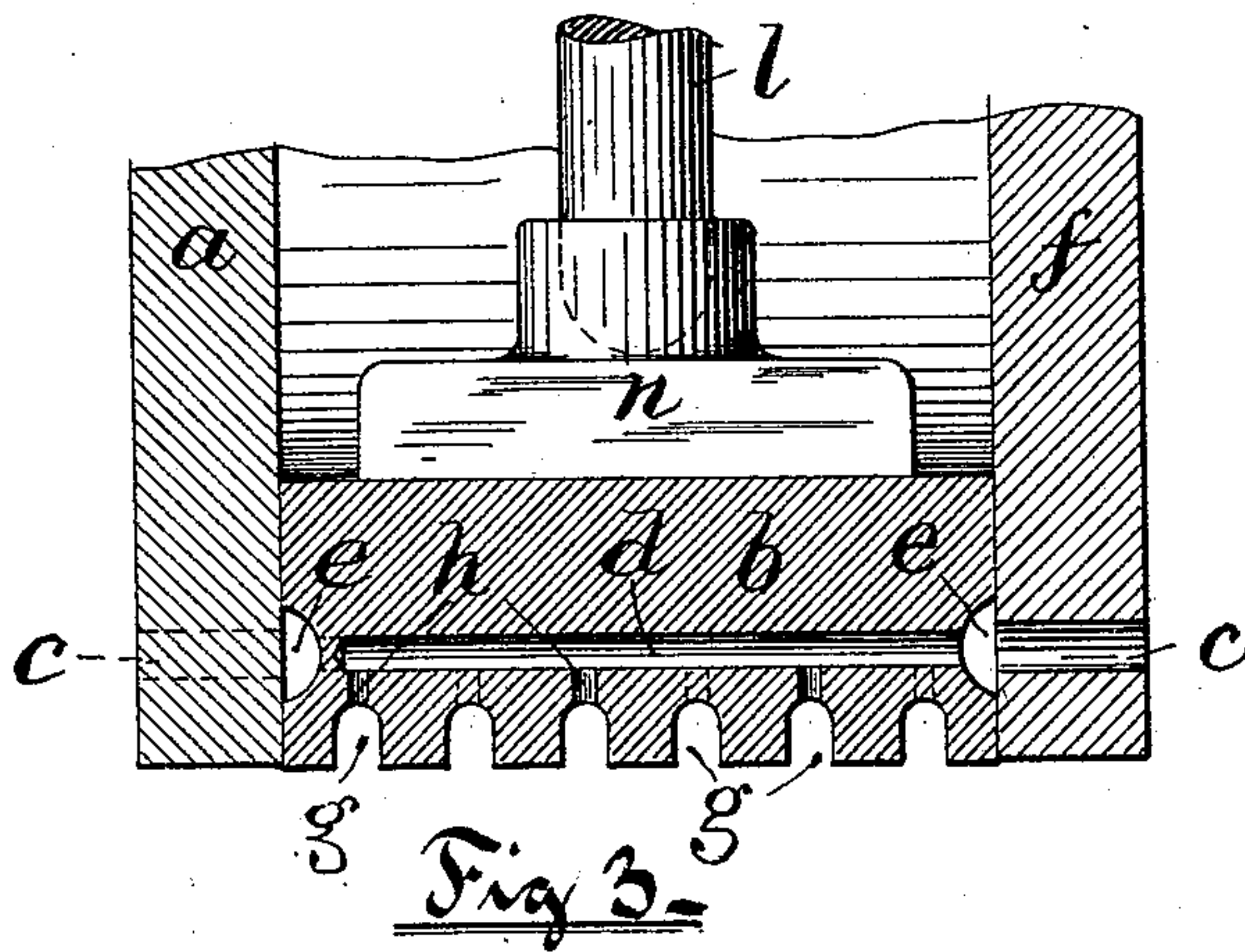
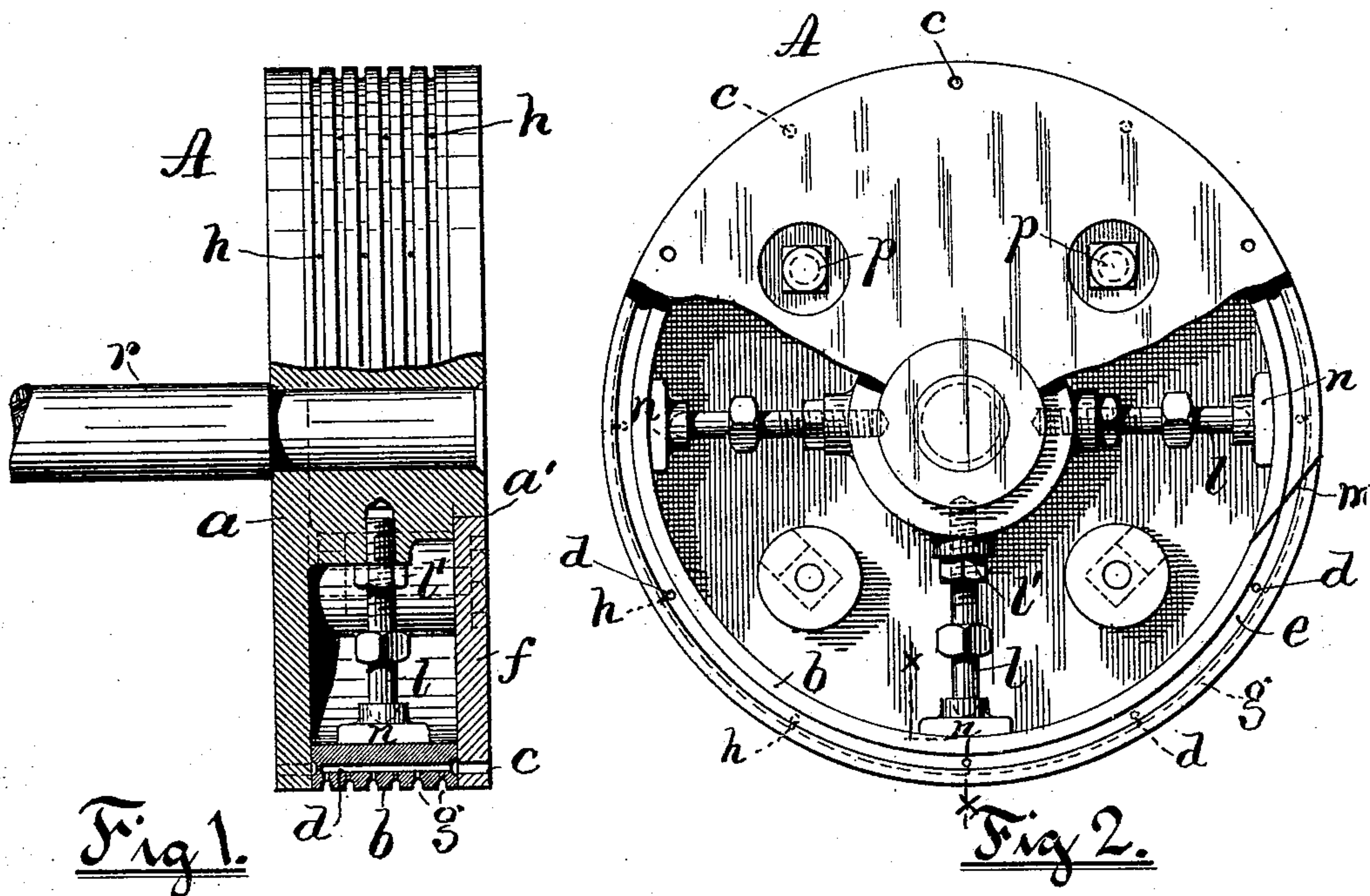


(No Model.)

N. T. GREENE.  
STEAM PISTON PACKING.

No. 495,221.

Patented Apr. 11. 1893.



Witnesses

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# UNITED STATES PATENT OFFICE.

NOBLE T. GREENE, OF PROVIDENCE, RHODE ISLAND.

## STEAM-PISTON PACKING.

SPECIFICATION forming part of Letters Patent No. 495,221, dated April 11, 1893.

Application filed November 7, 1892. Serial No. 451,164. (No model.)

*To all whom it may concern:*

Be it known that I, NOBLE T. GREENE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Steam-Piston Packings; 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 of reference marked thereon, which form a part of this specification.

In steam piston packings as hitherto constructed it has been usual to combine with the piston-head a chuck-ring and a series of expansible packing-rings, or sections of rings, mounted in the chuck-ring; live steam being introduced into the grooves or recesses in which the packing-rings are fitted to force the latter outwardly against the cylinder. In steam engine cylinders provided with pistons thus made it frequently happens that the former become worn to a cone-shape or tapering form after a comparatively short time; that is to say the end portions of the cylinder internally then being somewhat larger than the middle or central portion; this result is due to the action of the steam which upon being quickly admitted into the cylinder at initial pressure expands the packing-rings against the sides of the cylinder with great force; as the piston advances the reaction causes the impinging force to relax to some extent thus slightly contracting the rings; as the advance of the piston continues the packing is still further subjected to a reduced pressure owing to the expansion of the confined steam; the action of the steam, &c., as just described is repeated upon the return stroke. Notwithstanding the fact that such former packings are well adapted to conform to the bore of old cylinders having uneven or tapering sides and at the same time maintain a practically steam-tight joint yet it has been found that the packings referred to also act to produce unevenness in new cylinders.

The object I have in view is to produce an improved lubricating steam piston packing so constructed and adjusted to the cylinder in which it runs as to overcome the objections

to the use of steam-packed pistons as hitherto made, or such as before referred to.

To this end my invention consists essentially in the combination with the piston head and follower of an adjustable expansible chuck-ring provided with a series of peripherally arranged lubricating grooves communicating with steam openings or ducts, all as will be more fully hereinafter set forth and claimed.

In my present invention the packing proper comprises simply a grooved and apertured chuck-ring, cut transversely, and arranged so as to be adjusted to the bore of a true cylinder. By means of this arrangement a very accurate adjustment of the packing may be effected. When in use the oil and condensed steam lying in the ring-grooves form at the same time a self-lubricating packing, and by reason of which construction the cylinder is kept true and smooth, as no wear or cutting can take place.

In the accompanying sheet of drawings, Figure 1 is a side elevation, in partial central section, of a steam piston embodying my improvement. Fig. 2 is a front view of the same, a portion of the follower being broken away, and Fig. 3 is an enlarged transverse sectional view, taken on line *xx* of Fig. 2.

In the drawings *A* indicates a piston complete, provided with my improved lubricating steam packing. The head portion *a* and follower *f* of the piston may be substantially as common; the parts being secured together by a series of bolts *p*; a piston-rod *r* passes through the piston in any well-known manner. The adjacent faces of the head and follower are trued off, near the periphery, to frictionally engage the sides of the chuck-ring *b* about to be described. This chuck, or packing, ring I preferably make of cast-metal and turn a series of small shallow concentric grooves *g* in its periphery; the opposite or vertical faces of the ring are each provided with a continuous groove *e* from the bottom of which extend transversely a number of small holes *d*; these holes, however, do not pass entirely across the ring. The holes are located alternately; that is the holes extending from one groove *e* communicate with one-half of the series of grooves *g* via a series of shorter ducts *h*, as clearly indicated by full



lines in Fig. 3. The rest of the grooves *g* communicate with the other groove *e* through similar ducts, indicated by dotted lines. Through the flanges of the piston head and follower are drilled a series of small holes *c* which enter the side grooves *e*, as clearly represented.

The packing-ring is cut through transversely, as at *m*, Fig. 2, thereby adapting it to be expanded to some extent. In order to adjust or center the ring relatively to the piston-head I provide a series of adjusting screws *l* (say four) which are tapped into the head of the piston; the opposite end of each being let into a shoe *n* fitted to the inner or concave face of the ring; check-nuts *l'* being employed to prevent the screws from turning after the adjustment has been effected.

I claim as new—

1. In a steam piston, an expansible combined chuck and packing-ring made in one piece provided with ducts and peripheral grooves arranged to receive steam from the cylinder and conduct it into said grooves, the ducts and grooves not extending through the ring into the interior of the piston substantially as described.

2. In a steam-piston, the combination with the head and follower, of an expansible chuck-ring provided with a series of ducts and grooves, arranged substantially as described; steam passages communicating therewith, and means for effecting an adjustment of the ring the latter in use being rigidly clamped be-

tween the adjacent faces of the piston-flange and follower.

3. In a steam piston, the combination with the head and follower provided each near its periphery with a series of steam passages *c* and a series of adjusting screws tapped into said head, of an expansible combined chuck and packing ring made in one piece and supported by said screws and provided with ducts and grooves arranged to communicate with said steam passages, substantially as described.

4. In a steam-piston provided with a head and follower having steam passages *c* formed transversely therethrough near the outer edge or periphery, the combination therewith of the transversely cut combined chuck and packing-ring *b*, adapted to be clamped between the head and follower, provided with side grooves *e e* communicating with the said steam passages, a series of peripheral packing grooves *g* communicating with one of the said side grooves and a similar series of packing grooves communicating with the other side groove, and means for adjusting the packing-ring with relation to the cylinder in which it is to travel, substantially as hereinbefore described.

In testimony whereof I have affixed my signature in presence of two witnesses.

NOBLE T. GREENE.

Witnesses:

GEO. H. REMINGTON,  
IDA M. WARREN.