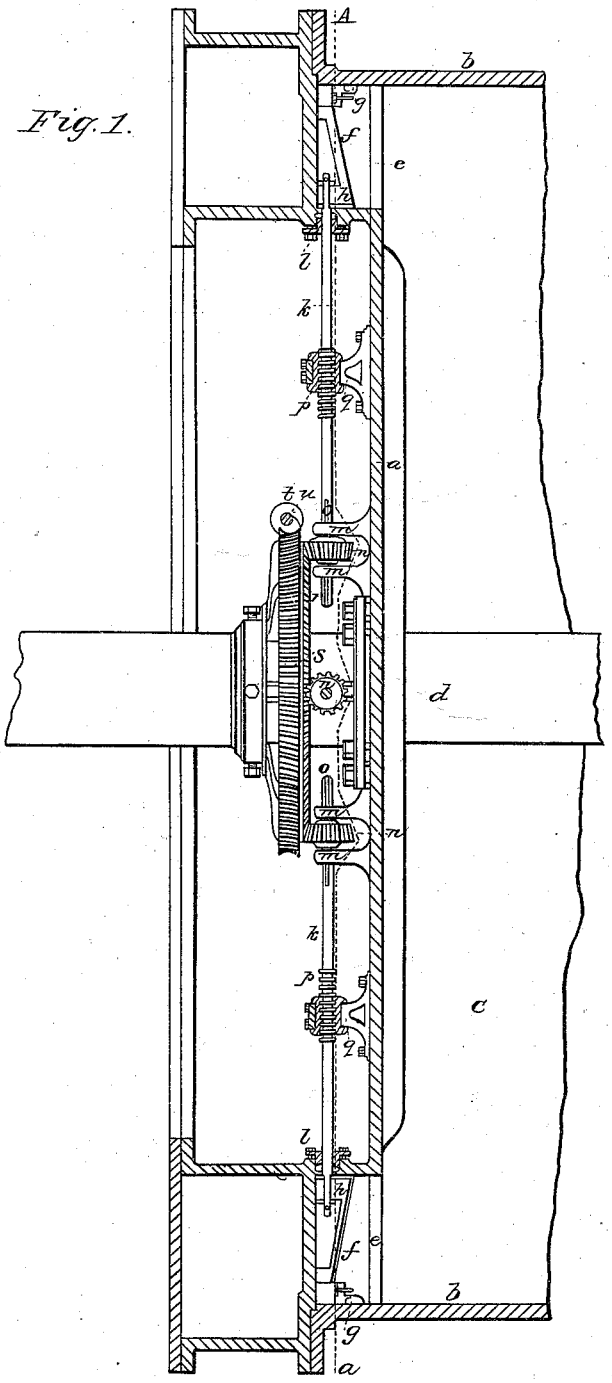
Sheet 1, 2 Sheets.

H. G. Thompson.

Rotary Engine.

No. 7,926. Patented Feb. 4, 1851.

Fig. 1.



Sheet 2, 2 Sheets.

H. G. Thompson.

Rotary Engine.

No. 7,926. Patented Feb. 4, 1851.

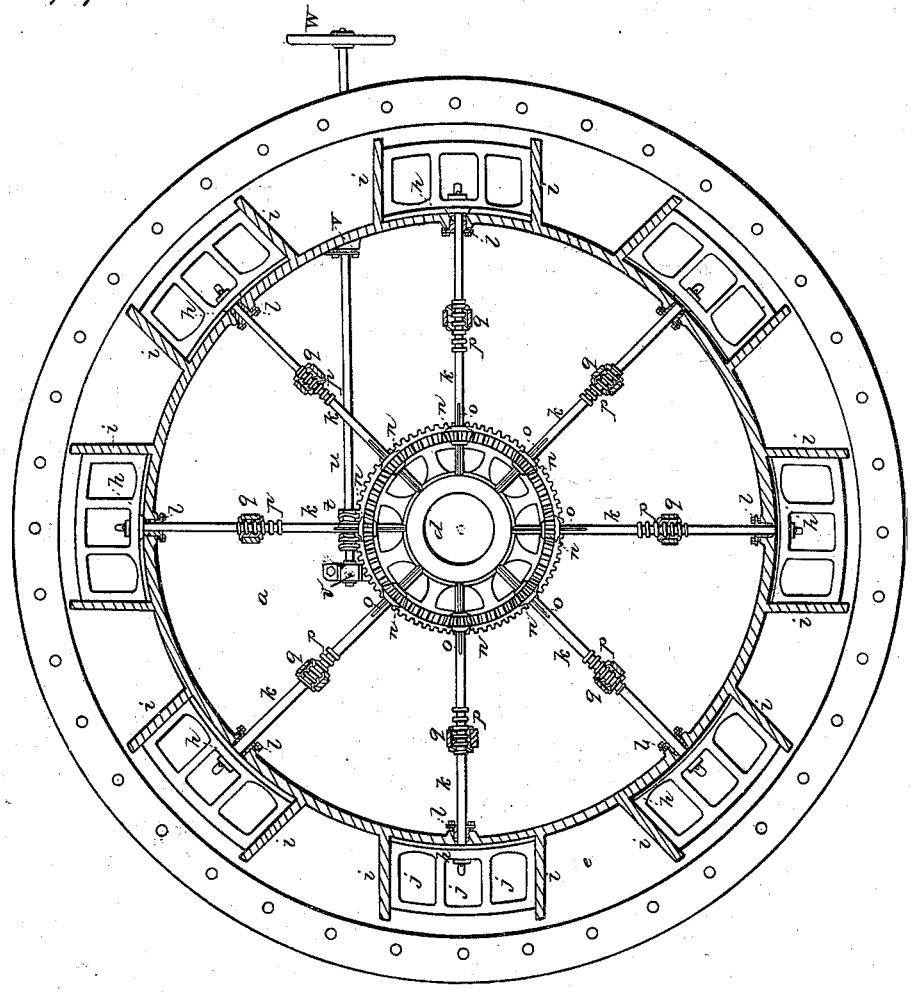


Fig. 2.

UNITED STATES PATENT OFFICE.

HENRY G. THOMPSON, OF NEW YORK, N. Y.

METHOD OF ADJUSTING THE PACKING OF ROTARY ENGINES.

Specification of Letters Patent No. 7,926, dated February 4, 1851.

To all whom it may concern:

Be it known that I, HENRY G. THOMPSON, of the city, county, and State of New York, have invented a new and useful Improvement in the Method of Packing Rotary Steam-Engines, and that the following is a full, clear, and exact description of the invention, the principle or character which distinguishes it from all other things before known and of the method of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertial section taken in a plane parallel with the shaft of the steam wheel and Fig. 2 another section taken at the line A, *a*, of Fig. 1.

The same letters indicate like parts in all the figures.

The object of my invention is to pack the junctions of the steam wheel and heads of the steam cylinder of rotary steam engines in such way that the packing shall be at all times under the control of the engineer that he may have it in his power to tighten or loosen it at his discretion to suit circumstances whether the engine be at rest or in action.

My invention consists in packing the ends of the steam wheel and cylinder heads of rotary steam engines by means of a metal ring at each end fitted to the face of the steam wheel and adapted to slide in an annular groove in the cylinder head or end of the casing which incases the steam wheel, when the said packing ring is combined with a series of segment wedges interposed between the said packing ring and cylinder head and adapted to slide radially and each coupled with a screw shaft or arbor, which is free to slide endwise in a pinion, the series of pinions being so arranged as to be simultaneously turned in either direction by a cog-wheel on the main shaft of the engine and operated by a worm or thread—or the mechanical equivalent thereof—on the shaft of a hand wheel, so that by the turning of the said hand wheel, the series of segment wedges shall be simultaneously drawn in toward, or forced out from the center and thus by their wedge form force the packing ring from or toward the face of the steam wheel, and thus adapt the packing to the condition of the engine.

In the accompanying drawings (*a*) represents one head of the cylinder (*b*) within which is fitted the steam wheel (*c*) mounted on the main shaft (*d*) which passes through the center of the head. The drawings represent only a short section of the cylinder and steam wheel as these make no part of my present invention, and may be made on any plan. The inside of the head is formed with an annular groove (*e*) to which is fitted a packing ring (*f*). This ring must be accurately fitted to slide in the groove and the outer periphery should be packed as at (*g*) in the usual manner of packing steam joints to prevent the passage of steam; and its inner face should be fitted by a ground joint to the face or end of the steam wheel, so that when these two surfaces are in actual contact they shall form a steam tight joint. The other face of this said packing ring is in the form of the frustum of a flat or obtuse cone, and to this face are fitted a series of segment wedges (*h*,) which slide radially between the conical face of the ring and the bottom of the groove (*e*); and between guide pieces (*i*, *i*,) that project from the bottom of the groove. To reduce the weight of the segment wedges they are formed with open spaces (*j*) as shown in the drawings.

To each of the segment wedges is coupled one end of an arbor (*k*) which passes to the inside of the cylinder head and is adapted to a stuffing box (*l*) in which it turns and slides,—but this stuffing-box may be dispensed with. The inner end of the said arbor turns and slides in appropriate boxes in two bracket-pieces (*m*, *m*), on the cylinder head between which is placed a bevel cog pinion (*n*) by which the arbor is turned, the arbor being grooved at (*o*) to receive a feather in the bore of the pinion, so that the arbor may be free to slide in the pinion while it is turned by it. At (*p*) the said arbor is threaded and passes through a nut (*q*) attached to the cylinder head, so that when the pinion is turned to the right or to the left, the arbor will be caused to slide radially toward or from the center of the main shaft and with it the segment wedge coupled to it. The series of segment wedges are arranged at equal distances around the circle and each one is coupled to a screw arbor provided with a pinion such as above described. The series of pinions (*n*) all mesh into the cogs of a bevel wheel (*r*) that turns between collars on the main shaft, and the

periphery of the said wheel is also cogged as at (*s*) which cogs are engaged by the threads of a worm or screw (*t*) on an arbor (*u*) that has its bearings in bracket pieces (*v*, *v*), the outer end of the said arbor being extended out beyond the periphery of the cylinder and there provided with a hand wheel or winch (*w*).

From the above arrangement it will be seen that by the turning of the hand wheel in one or the other direction the series of segment wedges, will be moved in or out and thus either free the packing ring or force it up against the face of the steam wheel and that by reason of increased leverage the engineer will be able to exert a very great force on the packing ring, and be enabled at all times to adapt the packing to the condition of the engine, whether at rest or in motion. It will be seen that this mode of adjusting the packing can be applied to any rotary engine which requires packing to be interposed between the steam or piston wheel and cylinder or casing.

One of the great and leading advantages of my invention is that the packing is entirely under the control of the engineer during the working of the engine or before starting, so that should there be any inequality in the expansion of the parts of the engine, the packing can be readily adjusted and thus avoid either too great binding or too great leaking. As both ends of the engine are to be packed in the same manner, only one end has been described and represented.

Having thus fully explained the principle of my invention and the mode of constructing and using the same, I wish it to be clearly understood that I do not limit myself to the precise construction of the various parts and the arrangement of them as above specified, as these may be varied within the principle of my invention.

What I claim as my invention and desire to secure by Letters Patent is—

The method substantially as above described of regulating the packing ring interposed between the steam wheel and head of the cylinder or outer casing of rotary steam engines by combining with the said packing ring a series of segment wedges operated simultaneouly in manner substantially as described.

HENRY G. THOMPSON.

Witnesses:

RENNER MARTIN,

JESSE PAYNE.