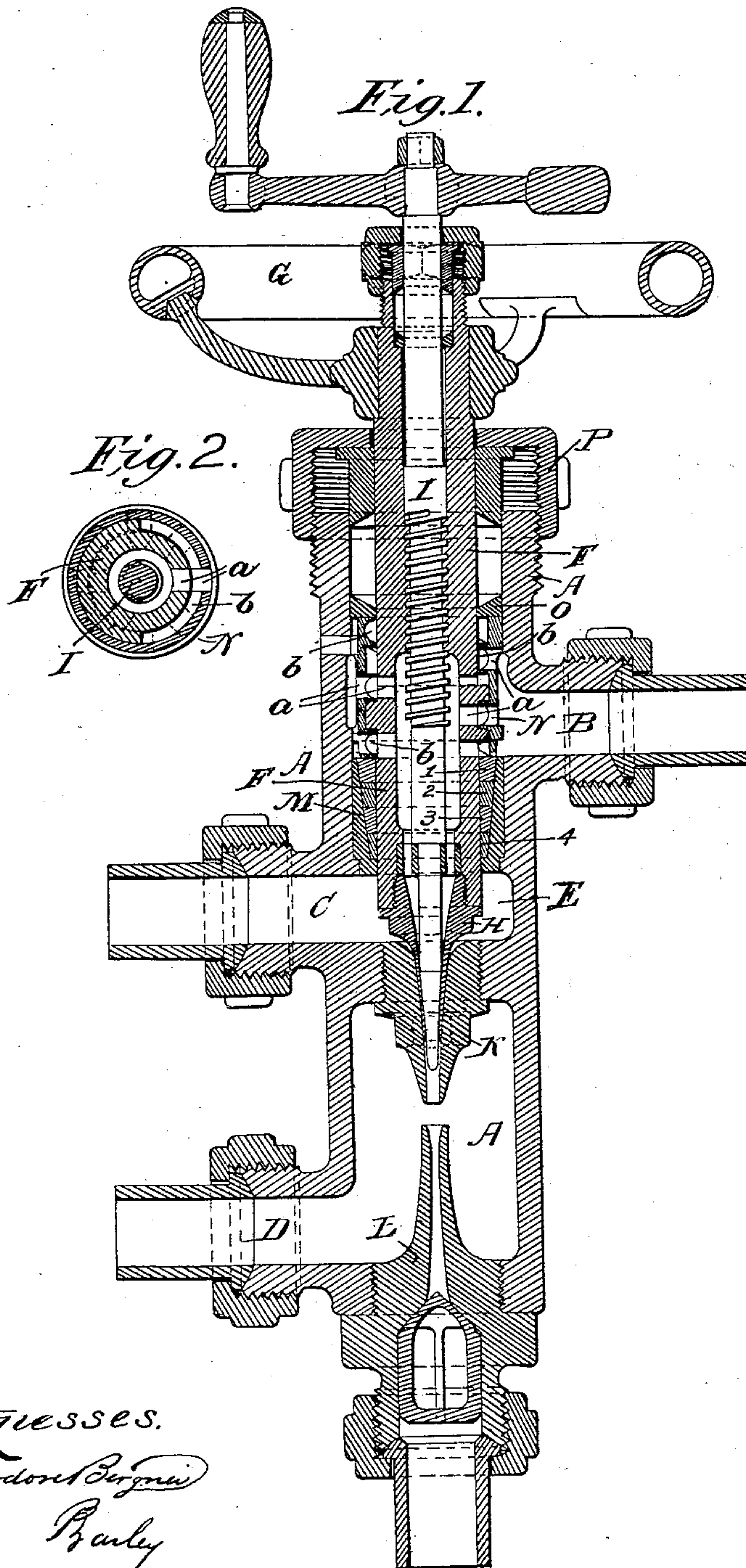


W. SELLERS.  
GIFFARD INJECTOR.

No. 39,313.

Patented July 21, 1863.



Witnesses.

*Theodore Bergman*  
*Barley*

Inventor.

*Wm Sellers*



# UNITED STATES PATENT OFFICE.

WILLIAM SELLERS, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN THE GIFFARD INJECTOR.

Specification forming part of Letters Patent No. 39,313, dated July 21, 1863.

*To all whom it may concern:*

Be it known that I, WILLIAM SELLERS, of the city of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in the Construction of Giffard's Injector; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawing, and to the figures and letters of reference marked thereon.

My invention relates to the self-acting feeding apparatus for steam-boilers for which Letters Patent of the United States, dated April 24, 1860, were granted to Henry Giffard, of the city of Paris, France; and has for its object, first, an improvement in the packing between the steam and water chamber; and, secondly, a material reduction of the length and weight of the whole instrument.

The nature of my invention consists in the use of compressible stationary packing, through which the piston moves between the steam and water chambers, and the employment of a perforated nut for regulating the longitudinal motion of the piston to control the water-supply, whereby increased wearing surface and durability of the packing is obtained, and the length and weight of the instrument is greatly reduced, the perforated nut serving the double purpose of adjusting the water-supply and admitting the steam to the interior of the hollow piston; and in order that my said invention may be fully understood, I will now proceed more particularly to describe the construction and operation of the same.

Referring to the drawing, forming part of this specification, in which the same letters of reference allude to similar parts throughout, Figure 1 is a sectional elevation of an injector with my improvements attached, and Fig. 2 a transverse section of the perforated nut and hollow piston.

The body or shell of the injector consists of a single casting, A, Fig. 1, which is provided with nozzles for the attachment of the steam-pipe B, water-supply pipe C, and overflow D. E is the water-chamber, and F the ram or piston, extending from the latter through the top of the cylinder, and actuated by means of the hand-wheel G. The piston F is fitted in the usual manner with a tapered mouth-piece, H, and a spindle, I, for regulating and adjust-

ing the supply of steam. K is the delivery-pipe, screwed into the body of metal separating the water-chamber from the overflow-chamber, and L the receiving-pipe, screwed into the lower end of the cylinder A.

Between the water-supply C and steam-nozzle B I provide a bushing, M, which is well fitted and forced into the outer shell or casing A until it rests against a shoulder at its lower extremity. The inside of this bushing is bored out conical, to receive the four metallic packing-rings 1 2 3 4, which, when forced into the bushing M, are fitted upon the ram or piston F, No. 4 resting upon a shoulder on the inside of the bushing M. Each one of these packing-rings is cut entirely through, the cuts being so disposed as to break joint with each other, and prevent the passage of steam.

From this arrangement it will be obvious that forcing the packing-rings into the bushing M will cause them to contract upon the ram F. To compensate for any wear of this packing it is only required to reduce slightly the depth of the same by taking a light cut off the smallest end of No. 4, so that the forcing of the packing into M will contract it beyond its former limit before being arrested by the inside shoulder of bushing M. Upon packing-ring No. 1 I place the nut N, which slides freely in the outer shell or casing A, but is prevented from turning by a pin or other suitable device. The collar O, forming the bottom of the upper packing-case or stuffing-box, rests upon the nut N, and when the upper packing is in place and compressed by the nut P, the pressure will be transmitted through the nut N to the lower packing-rings, keeping them in place, and preventing the escape of steam either side of the steam-nozzle B. The adjusting-nut N and the screw-threaded part of piston F are perforated by a series of openings, *a a a a*, for the purpose of conveying the steam from the chamber B to the interior of piston F.

To make all the openings available for the passage of steam at any position of the piston, the nut N is provided with an internal groove, *b b*, following the pitch of the thread, and forming a channel through which the steam is conveyed from the outer opening to the inner ones where the holes of the inner and outer series are not directly over each other.



With all injectors having the piston or ram F adjustable the space on the outside of the ram F, between the steam and water-supply, requires to be packed to prevent the steam under pressure in the chamber B from escaping into the water-chamber C. As heretofore constructed, this packing consisted of hemp or other soft material, wound tightly around and compressed into a groove turned for that purpose in the body of the ram and moving with it. When very high steam is used this soft packing burns out and requires frequent renewal.

By the use of my compressible stationary packing, however, this difficulty is not only completely obviated, but other important advantages are obtained. Upon referring to the drawing of my previous application for Letters Patent for other improvements in Giffard's injector, filed in the Patent Office August 15, 1861, and comparing that drawing with the one annexed to this present application, it will be seen that although the stationary packing has three times the wearing surface of the former packing, the space between the steam and water chamber B and C is reduced to nearly one-half of its original length. The length of the whole instrument is, however, further greatly reduced by passing the steam through the nut N. as described. instead of

below it, as heretofore, the nut being held longitudinally by the upper and lower packing series, to keep both in place, and enables the operator to tighten the lower packing when in use.

It will be readily understood that the described method of arranging and compressing the stationary packing may be modified in various ways, which will accomplish the same result as that herein described; therefore,

Having thus set forth the nature of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The use of the compressible stationary packing between the steam and water chambers, when arranged substantially in the manner and for the purpose set forth.

2. The use of the adjusting-nut, when so constructed as to permit the steam which operates the injector to pass through it.

3. The employment of compressible metallic packing below the steam-chamber, in combination with packing of elastic material above the steam-chamber, with the perforated nut intervening, substantially in the manner and for the purpose described.

WM. SELLERS.

Witnesses:

THEODORE BERGNER,  
I. H. BAILEY.