

J. P. HIGH.
FLUE EXPANDER.
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908,669.

Patented Jan. 5, 1909.

Fig. 1.

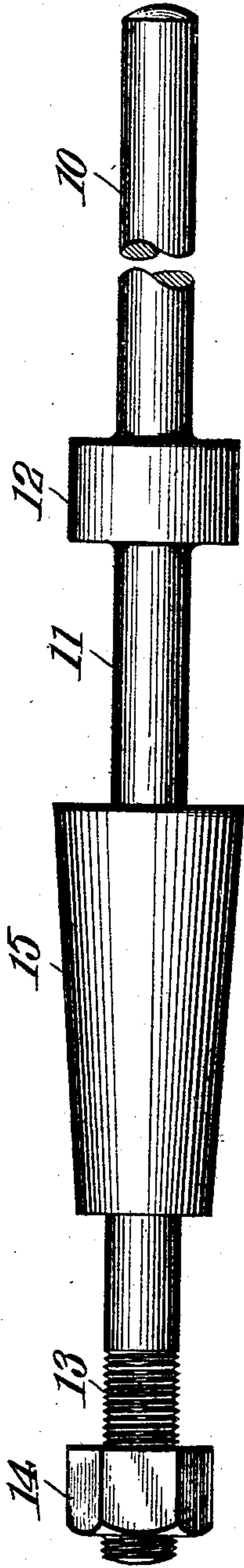
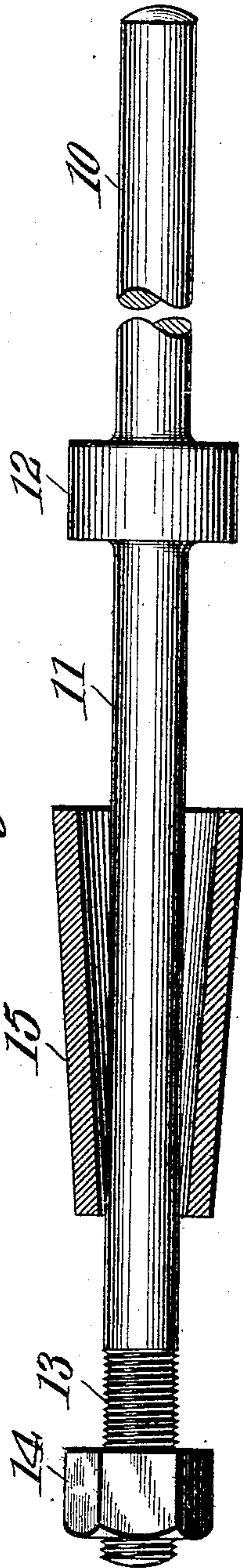


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES PAYTON HIGH, OF FAIRVIEW, OKLAHOMA.

FLUE-EXPANDER.

No. 908,669.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed August 13, 1908. Serial No. 448,362.

To all whom it may concern:

Be it known that I, JAMES PAYTON HIGH, a citizen of the United States, residing at Fairview, in the county of Major and State of Oklahoma, have invented a new and useful Flue-Expander, of which the following is a specification.

This invention relates to flue expanders and the principal object thereof is to provide an improved form of flue expander especially adapted for use on locomotives to expand the flues in the event of their leaking while the engine is running.

It is well known that at times much trouble is caused by the flues leaking in locomotive boilers around the end inserted in the fire box tube seat. Ordinarily it is necessary to wait until the engine is stopped to make the repairs, and various devices have been used for the purpose of stopping the leakage. The present invention, however, provides a means for expanding the flue ends in the sheet even while the engine is in operation and a fire in the firebox.

To this end, the invention consists in general of a bar of sufficient length to reach through the fire-box and provided at its end with a loosely mounted flue-expanding member.

The invention further consists in certain novel details of arrangement and combinations of parts, hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claims.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and:—Figure 1 is a side elevation of a flue-expander constructed in accordance with this invention. Fig. 2 is a longitudinal section through the expanding member and showing the bar in elevation.

The numeral 10 indicates the body of the bar and this body is provided with a reduced end 11 between which and the body portion is a collar 12. The extreme end of the portion 11 is provided with screw threads as indicated at 13, and a nut 14 is held thereon. Between the nut 14 and the collar 12 there is provided an expanding member 15 having a frusto-conical exterior and a similar frusto-conical interior, the interior diameter being somewhat larger than the diameter of the reduced end 11, so that the member 15 fits loosely thereon. This member 15 is made of less length than the distance between the nut 14 and the collar 12, so that it

has longitudinal movement relative to the bar, the collar and nut acting as stops to limit the said longitudinal movement. This member 15 is made of such exterior diameter as to suit the flues of the boiler.

In the operation of the device the bar is inserted through the door of the fire-box and the smaller end of the member 15 positioned within the flue which it is desired to expand. The outer end of the bar may then be struck with a sledge or the like, and the member 15 will be forced into the flue, and, by reason of its shape, expand the same. When the flue has been expanded the rod is jerked suddenly backward and the inertia of the moving rod will act as a shock to remove the expanding member 15 from the flue. When it is desired, the rod may be utilized as a hammer to force the member 15 into the flue by moving the rod to and fro so that the collar 12 strikes repeated blows on the larger end of the member 15. When necessary, the rod may be bent to position the member 15 in flues which do not lie directly in front of the fire-box door.

By reason of the member 15 being loosely mounted upon the end 11 said member will always position itself properly in the flue.

It is obvious that minor changes may be made in the form and construction of this invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described, but it is wished to include all such as properly come within the scope thereof.

Having thus described the invention, what is claimed as new, is:—

1. A flue expander comprising a bar of uniform cross sectional diameter throughout its entire length, a hollow expanding member loosely mounted for sliding movement thereon and having an uninterrupted frusto-conical exterior surface, and a similar interior surface, the interior of the expanding member being of greater diameter than that portion of the bar whereon the member is mounted, a stop carried by one end of the bar, and an impact collar secured to said bar in spaced relation to the opposite end thereof and provided with a square shoulder adapted to engage the adjacent end of the expanding member.

2. A flue expander comprising a cylindrical bar of uniform cross sectional diameter throughout its length and having one end

thereof threaded, a hollow frusto-conical expanding member loosely mounted for sliding movement on the bar and having its exterior walls uninterrupted to form a smooth
5 continuous bearing surface, the interior of the expanding member being of greater diameter than the bar, a circumferential impact collar spaced inwardly from one end of the bar and adapted to engage the large end
10 of the expanding member, and a nut engaging the threads on the bar and adapted to

engage the small end of the expanding member for limiting the longitudinal movement of said member.

In testimony that I claim the foregoing as
my own, I have hereto affixed my signature
in the presence of two witnesses.

JAMES PAYTON HIGH.

Witnesses:

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