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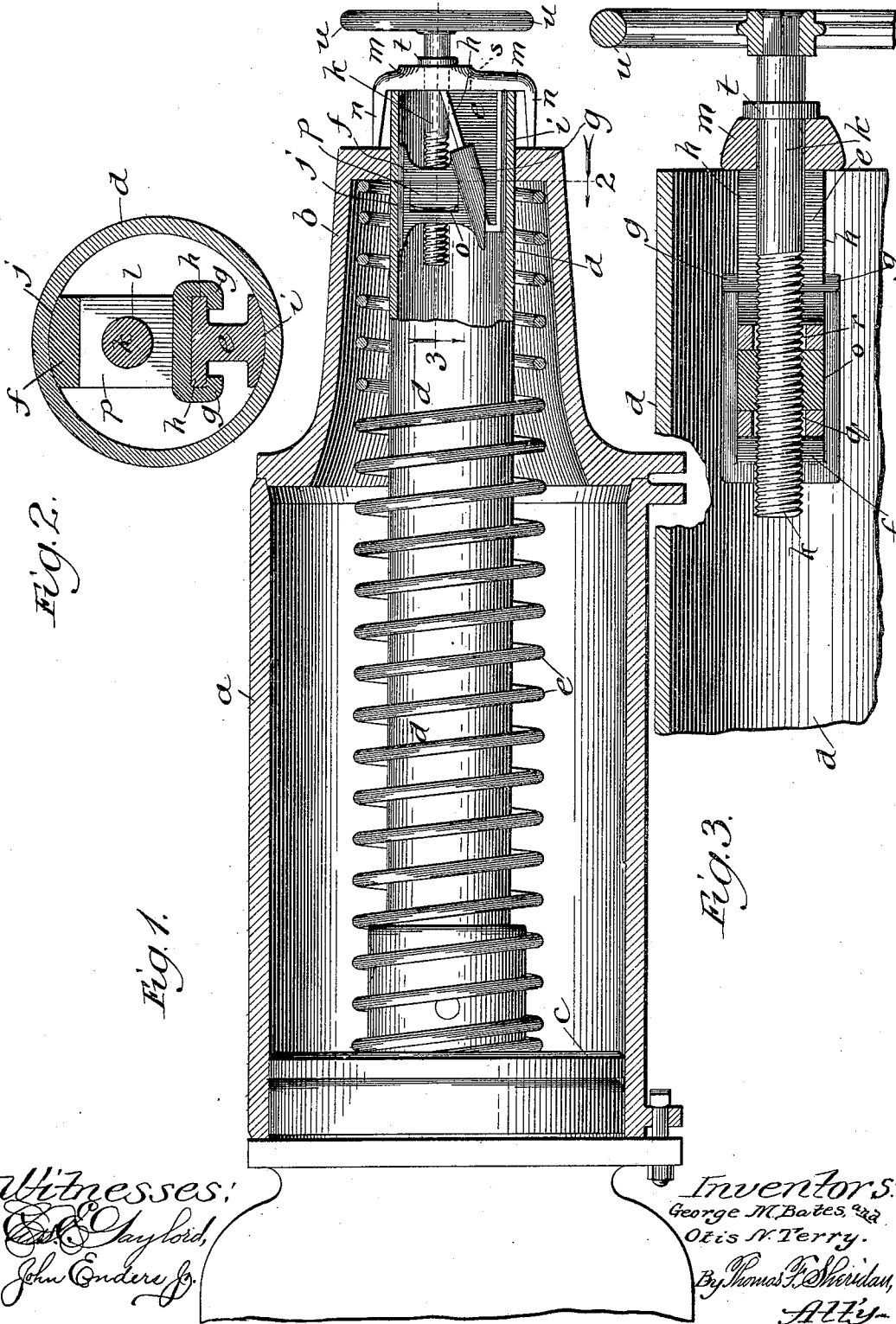
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TOOL FOR HOLDING AIR BRAKE PISTONS AND CYLINDER HEADS.

(Application filed May 3, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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TOOL FOR HOLDING AIR-BRAKE PISTONS AND CYLINDER-HEADS.

SPECIFICATION forming part of Letters Patent No. 683,546, dated October 1, 1901.

Application filed May 3, 1901. Serial No. 58,645. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. BATES and OTIS N. TERRY, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tools for Holding Air-Brake Pistons and Cylinder-Heads, of which the following is a specification.

Our invention relates to that class of tools adapted to secure an air-brake piston-rod and cylinder-head together and hold them while being removed from the cylinder, cleaned, oiled, or repaired and replaced, and particularly to the means for securing the tool to the piston-rod, and the means whereby a base is provided upon which the piston and cylinder-head may rest in an upright position while being removed from the cylinder.

The principal objects of the invention are to provide a simple, economical, and efficient tool adapted to connect and hold a piston-rod and cylinder-head firmly together while being removed, cleaned, and replaced, and adapted to form a base for holding them in an upright position while removed, and to provide a tool which is also light and easily carried from place to place, readily adjusted and disengaged, strong, durable, and easily replaced, all of which will more fully and particularly hereinafter appear.

The invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the drawings, Figure 1 is a sectional view of our improved tool shown in operative connection with a hollow piston-rod and a cylinder-head of the ordinary type in connection with air-brakes on railroad-cars; Fig. 2, a transverse sectional view taken on line 2 of Fig. 1 looking in the direction of the arrow; and Fig. 3, an enlarged detail sectional view taken on the line 3 of Fig. 1 looking in the direction of the arrow, showing the movable wedge-shaped portion or sliding block in section and the threaded rod with the nut removed.

In illustrating and describing our improved tool we have deemed it advisable to show it in connection with such portions of an ordinary piston-cylinder and cylinder mechanism for air-brakes as is necessary to illustrate

and describe the purposes for which the tool is intended, its mode of operation, and the means whereby the purposes of the invention are accomplished.

In Fig. 1, *a* is a piston-cylinder of the type ordinarily used on railroad-cars in connection with other mechanisms (not shown) for operating air-brakes, particularly those on freight-cars. *b* is the cylinder-head; *c*, the piston-head; *d*, a hollow piston-rod attached to the piston-head in the ordinary manner, and *e* a spring extending from the cylinder-head to the piston-head, having a constant tension, pressing the piston-head away from the cylinder-head.

It is well known in the art to which this invention relates that it is necessary to frequently remove the piston-head, hollow piston-rod, and cylinder-head of an air-brake cylinder in order that the cylinder and piston may be inspected, cleaned, and oiled, and that much valuable time is consumed in removing and replacing the parts, especially when the cylinder-head and piston are removed separately. It is therefore desirable that means be provided for holding the piston, piston-rod, and cylinder-head together when removed from the cylinder, whereby the spring is prevented from recoiling and much time and labor necessary to its proper readjustment is saved. In order to accomplish this, we provide a relatively stationary wedge-shaped portion *e* and a movable wedge-shaped portion or sliding block *f*, which is slidably mounted thereon, the broad end of the sliding block being toward the narrow end of the stationary portion. It will thus be seen that an inclined plane surface of each member is in sliding contact with the other member, the outer and opposite surfaces of each being substantially parallel with each other. The sliding block *f* is slidably mounted upon the wedge-shaped portion *e* and is provided with interlocking flanges *g*, which project beyond and partly inclose flanges *h* on the stationary wedge-shaped portion. In this way an interlocking slide connection is formed between the two wedge-shaped portions. As the sliding block is moved in one direction the outer surfaces *i* and *j* of the two wedge-shaped portions are forced apart, causing them to impinge firmly against the inner

periphery of the hollow piston-rod, into which they are inserted, as shown in Fig. 1. The tool is thus fastened firmly to the piston-rod.

In order to move the sliding block upon the inclined plane of the stationary wedge-shaped portion and obtain this result, a threaded rod *k* is provided and passed through the opening *l* in the sliding block, which opening is enlarged, as at *o*, for the purpose of admitting a threaded nut *p*, which is mounted in the sliding block upon and in threaded connection with the threaded rod. The opening which admits the rod is made small, as at *q* and *r*, to hold the nut in its place and prevent it from moving laterally of the sliding block when the screw is turned, the opening being squared to correspond with the shoulders of the nut and prevent it from turning with the screw or threaded rod. The stationary wedge-shaped portion is, in fact, an arm extending from and united at its broad end with a body portion *m*, which extends outward transversely beyond the piston-rod, and this body portion is provided with legs *n*, which reach to and rest upon the end of the cylinder-head when the piston-rod is in its place and the tool is in operative position, admitting the end of the piston-rod between them in cases where it extends beyond the cylinder-head, as shown in Fig. 1. This body portion is provided with an opening *s*, preferably oblong, through which the threaded rod is passed, and a shoulder *t* is provided upon the threaded rod, extending beyond the edges of the opening to hold the rod in place against the action of the threads and cause the sliding block to move toward such shoulder when the rod is turned in the direction which tightens the sliding block.

For the purpose of enabling the threaded rod to be turned with sufficient force, and for the further purpose of providing a base upon which to rest the tool and removed parts of the cylinder mechanism, a hand-wheel *u* is mounted upon the threaded rod, which wheel is of such diameter as to provide a sufficient base to hold the parts in an upright position upon the ground while being cleaned or repaired. By means of the above it will be seen that by turning the threaded rod in one direction the sliding block is permitted to occupy a position near the small end of the stationary wedge-shaped portion, when such parts can be readily inserted into the hollow piston-rod. Then by turning the hand-wheel and threaded rod in the opposite direction the sliding block is caused to move toward the broad end of the stationary wedge-shaped arm, which is prevented from moving inward by the body portion and legs *n*, which rest against the cylinder-head. The piston and cylinder-head are thus firmly held in place against the tension of the spring *e* and may be readily removed and replaced without becoming separated. When the cylinder parts are replaced, the tool is disengaged by turning the threaded rod in the opposite di-

rection to that which tightens the sliding block and giving it a light tap to dislodge the sliding block.

It will be readily apparent to any one skilled in the art that by threading the opening *l*, which admits the bolt or threaded rod, the nut *p* could be dispensed with. We have found, however, that the severe strain upon the threads forming the connection between the bolt and sliding nut soon impairs and destroys the thread *s*, and when the threads are made in the sliding block itself as soon as they are worn out a new sliding block must be supplied. To obviate this difficulty, the nut is employed in the connection shown, and when the threads are worn out upon the nut or rod it is only necessary to supply the part injured, which can be done at very slight expense. The more expensive part—the sliding block—can thus be used to cover a period during which many sets of threads are worn out and destroyed.

We claim—

1. In a tool of the class described, the combination of a relatively non-rotatable body portion adapted to extend transversely across and beyond the end of a piston-rod and engage the cylinder-head, a wedge-shaped arm non-rotatably mounted upon such body portion adapted to be inserted into a piston-rod, a sliding block upon the arm, and means for pressing the arm and sliding block tightly against the inner surface of the piston-rod to secure the piston-rod and cylinder-head together, substantially as described.

2. In a tool of the class described, the combination of a relatively non-rotatable body portion adapted to extend transversely across and beyond the end of a piston-rod and engage the cylinder-head, a wedge-shaped arm non-rotatably mounted upon such body portion extending at substantially right angles therewith and adapted to be inserted within a hollow piston-rod, a sliding block mounted upon the arm and means for pressing the arm and sliding block firmly against the inner surface of the piston-rod to secure the piston-rod and cylinder-head together, substantially as described.

3. In a tool of the class described, the combination of a relatively non-rotatable body portion adapted to extend transversely across and beyond the end of a piston-rod, a wedge-shaped arm non-rotatably mounted upon such body portion adapted to be inserted within a hollow piston-rod, a sliding block upon the arm, means for pressing the arm and sliding block firmly against the inner surface of the piston-rod, legs upon the body portion adapted to rest against the cylinder-head when the arm is in operative position within the piston-rod, and means for pressing the arm tightly against the inner surface of the piston-rod to secure the piston-rod and cylinder-head together, substantially as described.

4. In a tool of the class described, the combination of a relatively non-rotatable body

portion adapted to extend transversely beyond the end of a piston-rod and engage the cylinder-head, a non-rotatable wedge-shaped portion upon such body portion adapted to be inserted into a hollow piston-rod, a sliding block upon the wedge-shaped portion and means for pressing the wedge-shaped portion and sliding block tightly against the inner surface of the piston-rod, whereby the piston-rod and cylinder-head are held together, substantially as described.

5. In a tool of the class described, the combination of a relatively non-rotatable body portion adapted to extend transversely across and beyond the end of a piston-rod and engage the cylinder-head, a wedge-shaped arm non-rotatably mounted upon such body portion extending at substantially right angles therewith adapted to be inserted within a hollow piston-rod, a sliding block mounted upon such arm, and means for moving the sliding block upon the arm to cause the block and arm to contact the inner surface of the piston-rod, substantially as described.

6. In a tool of the class described, the combination of a relatively non-rotatable body portion, a wedge-shaped arm non-rotatably mounted upon such body portion extending at an angle therewith, a sliding block mounted upon such arm, and a threaded rod in operative connection with the sliding block, substantially as described.

7. In a tool of the class described, the combination of a perforated relatively non-rotatable body portion, a non-rotatable wedge-shaped arm upon such body portion extending at an angle therewith, a sliding block mounted upon such arm, a threaded rod in operative connection with the sliding block extending through the perforation in the body portion, a shoulder upon the threaded rod, and means for turning the rod, substantially as described.

8. In a tool of the class described, the combination of a relatively non-rotatable body portion, a wedge-shaped arm non-rotatably mounted thereon extending at substantially right angles therewith, a sliding block mounted upon such arm, a threaded rod in operative connection with the sliding block and body portion, and a hand-wheel upon the threaded rod, substantially as described.

9. In a tool of the class described, the combination of a relatively non-rotatable body portion, a wedge-shaped arm non-rotatably

mounted thereon provided with flanges upon opposite sides, a sliding block mounted upon such arm provided with flanges which interlock with the flanges on the arm, and means for moving the sliding block along the arm, substantially as described.

10. In a holding-tool of the class described, the combination of a relatively non-rotatable base portion arranged to span the hollow piston-rod of an air-brake cylinder and contact with the head thereof, a pair of wedges secured thereto, and means for sliding one on the other in one direction to cause them to impinge firmly against the inner surface of the piston-rod and in the opposite direction to permit their removal therefrom, substantially as described.

11. In a tool of the class described, the combination of a relatively non-rotatable body portion adapted to extend transversely across and beyond the end of a piston-rod and engage the cylinder-head, an arm non-rotatably mounted upon said body portion adapted to be inserted within a hollow piston-rod, expanding friction mechanism slidably mounted upon such arm, and means for operating the expanding mechanism, substantially as described.

12. In a tool of the class described, the combination of a relatively non-rotatable body portion adapted to extend transversely across and beyond the end of a piston-rod and engage the cylinder-head, an arm non-rotatably mounted upon such body portion adapted to be inserted within the hollow piston-rod, expanding friction mechanism mounted movably upon such arm, and threaded-screw mechanism for operating the expanding mechanism, substantially as described.

13. In a tool of the class described, the combination of a relatively non-rotatable body portion adapted to extend transversely across and beyond the end of the piston-rod and engage the cylinder-head, an arm non-rotatably mounted upon such body portion, a sliding block mounted upon the arm, a threaded screw for operating the sliding block, and a removable nut for connecting the threaded screw and sliding block, substantially as described.

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