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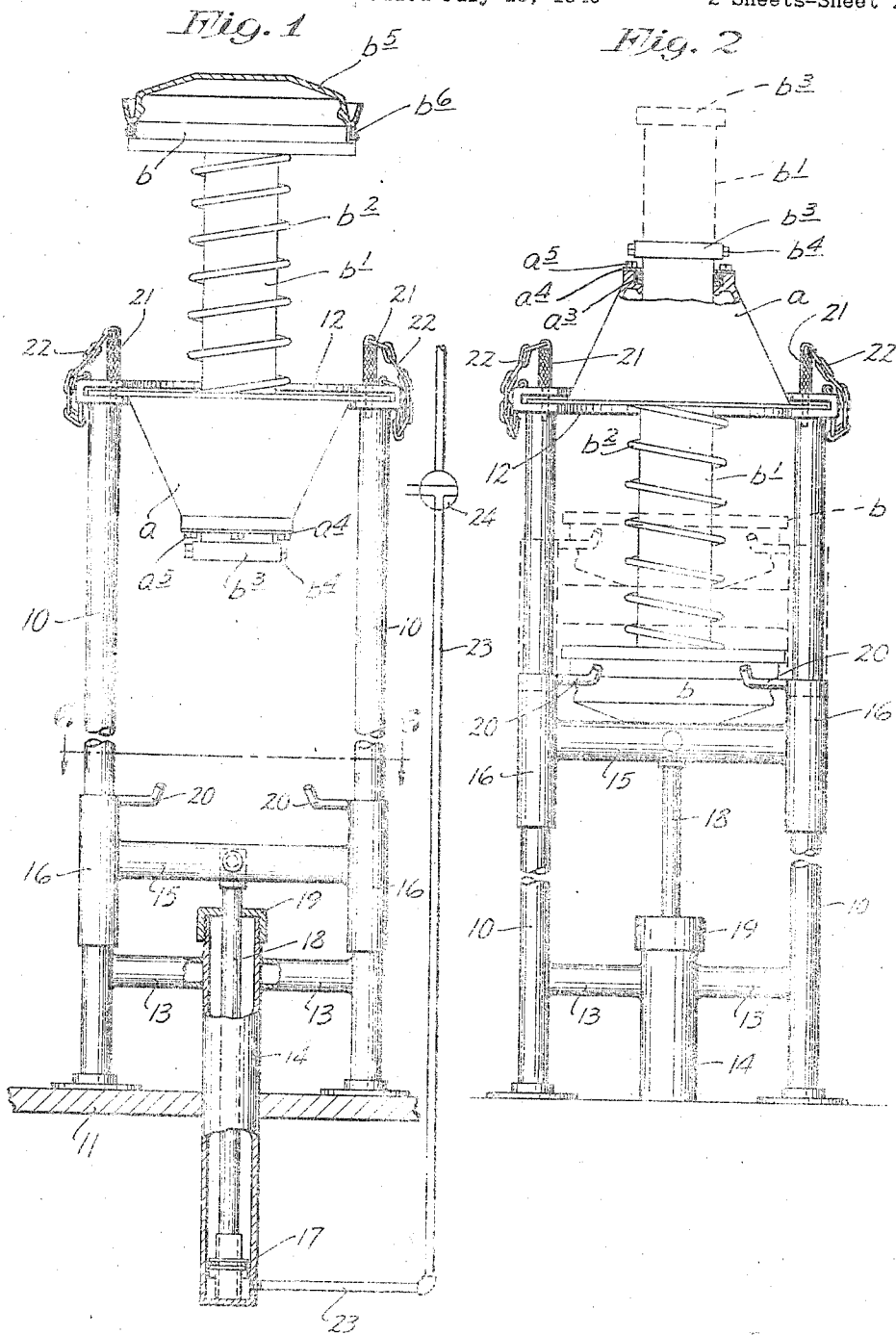
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2,234,819

TOOL FOR DISASSEMBLING AND REASSEMBLING BRAKE HEADS AND PISTONS

Filed July 15, 1940

2 Sheets-Sheet 1



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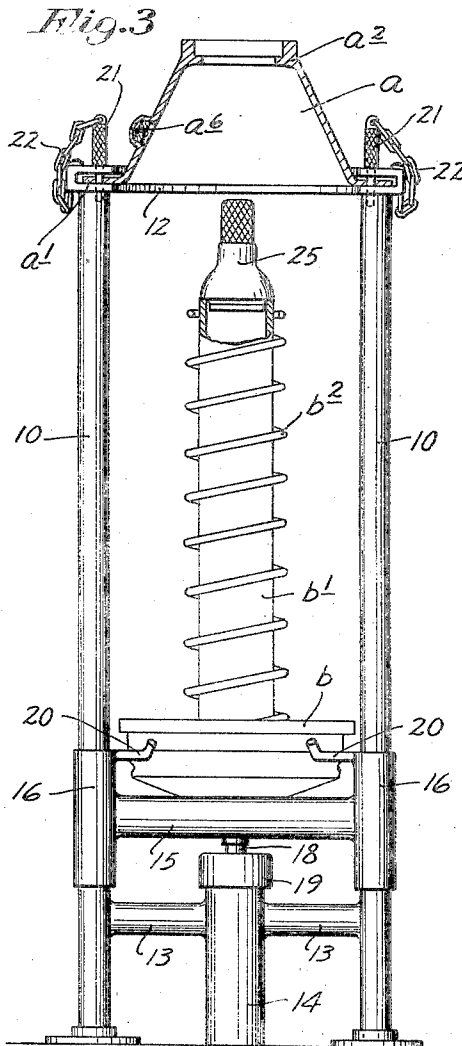
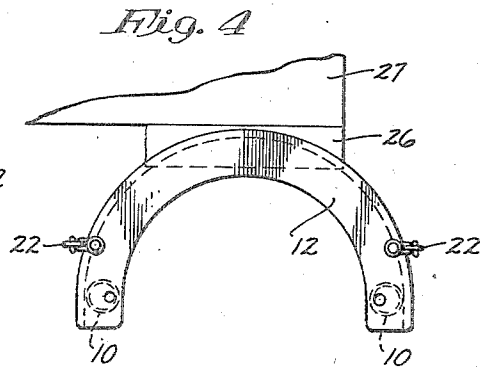
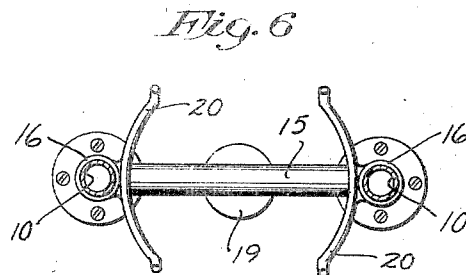
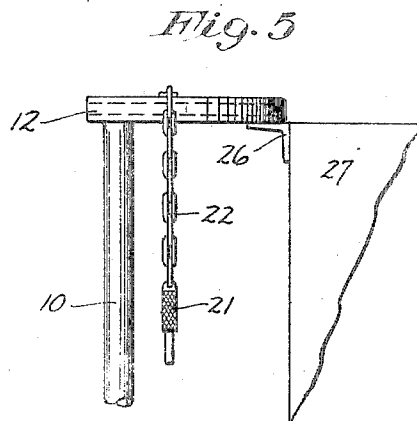
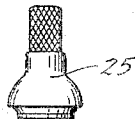


Fig. 7



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UNITED STATES PATENT OFFICE

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TOOL FOR DISASSEMBLING AND REASSEMBLING BRAKE HEADS AND PISTONS

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8 Claims. (Cl. 29—84)

My invention provides a highly efficient tool especially adapted for use in disassembling and reassembling brake heads and pistons. The improved tool, while capable of more extended use, has been especially designed and particularly adapted for manipulating the non-pressure heads and pistons of brake mechanism of the type generally known to the trade as A—B brake head and piston which form portions of the New York air brake and the Westinghouse air brake systems.

The improved tool, which is in the nature of a power-actuated machine, is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a front elevation with some parts broken away showing the improved tool and a brake cylinder and piston assembly of the character above indicated held in position by the tool and showing the non-pressure head set with the piston projecting upward therefrom;

Fig. 2 is a view corresponding to Fig. 1 but illustrating a different position of the non-pressure head and piston;

Fig. 3 is a front elevation with some parts in section but with the tool adjusted to hold the brake piston withdrawn from the non-pressure head;

Fig. 4 is a fragmentary plan view with parts broken away and with the brake assembly elements removed;

Fig. 5 is a fragmentary view in side elevation of the parts shown in Fig. 4;

Fig. 6 is a horizontal section taken on the line 6—6 of Fig. 1; and

Fig. 7 is a side elevation showing in detail the aligning head used in connection with or as a part of the improved tool.

Before describing the structure of the improved tool, the non-pressure head and piston of the said A—B brake motor mechanism will be briefly noted. In the drawings the non-pressure head is indicated by the character *a*, and the piston head by the character *b*. The non-pressure head *a* is shown as a truncated conical shell having an out-turned marginal flange *a—1* and a contracted neck *a—2*, which latter is grooved to form a seat for a removable packing *a—3* that is normally held in place by a retaining ring *a—4* rigidly but detachably secured by machine screws *a—5*, or the like. The piston head *b* is formed with a stem *b—1* which, as shown, is hollow and is surrounded by a coiled spring *b—2* which, when the elements of the brake head are assembled,

will be compressed between the piston head and the contracted end of the non-pressure head *a*. On the end of the piston stem *b—1* is a stop collar *b—3* rigidly but detachably held on said stem by set screws *b—4*, or the like. The piston head *b* in practice, of course, works in the cylinder of a brake motor, not shown, but the operation of which is well understood by those familiar with brake mechanism.

The piston head *b* is shown as provided with the customary "snap-on" packing or cover *b—5* and "swab" packing *b—6*, which elements are replaceable and require frequent replacement or repair. The head *a*, as shown, is provided with the customary strainer-equipped air vent *a—6*.

The tool or device proper in its preferred form involves a pair of laterally spaced parallel upright guide posts *10*, which, at their lower ends, are securely anchored to a floor or base support *11*. Rigidly secured to the upper ends of these posts *10* is an anchoring segment *12* that is U-shaped in cross section with its opening inward and with its ends extended preferably through a little more than 180°. The said anchoring segment can be rigidly secured to the posts in various ways but is preferably electrically welded thereto. Near their lower ends the posts *10* are rigidly connected by a cross member *13* to the intermediate portion of which is rigidly secured a cylinder *14* that depends therefrom and, as shown, is extended through the floor *11* to a lower elevation. Both the posts *10* and the cross member *13* are preferably tubular, and the posts are provided with smooth exteriors to afford guides for a crosshead that affords a lifting member or elevator. This crosshead, as shown, is made up of a horizontal member *15* provided at its ends with upright sleeves *16* that slide freely on the posts *10*.

Working in the cylinder *14* is a piston head *17*, the rod *18* of which works freely and loosely through a cap *19* on the upper end of the cylinder so that atmospheric pressure will be effective in the cylinder above the piston head. The axis of the piston rod *18* is coincident with the axis of the arc of the anchoring segment *12* and the upper end of said rod is connected to the intermediate portion of the cross bar or member *15* of the crosshead. Centering or aligning fingers *20* are attached to the upper ends of the sleeves *16* and operate in a manner hereinafter to be noted. To lock or secure the non-pressure head *a* in either of the positions shown in Figs. 1 and 2, its flange *a—1* will be inserted in the channel of

the anchoring segment 12 and will be locked thereto by pins 21 inserted through coincident perforations in the flanges of said segment and in the flange a-1 of said head a. The pins 21 are shown as attached to the anchoring segment 12 by means of chains or other flexible connections 22 which prevent the pins from being misplaced or lost.

The cylinder 14 and piston 17 afford an air motor for applying power to raise the crosshead and to convey the motive fluid, air or water, to the lower end of said cylinder below said piston and supply pipe 23 is extended from a suitable source to the lower portion of said cylinder. In the pipe 23 is a three-way valve 24, which when set as shown diagrammatically in Fig. 1, will vent the lower end of the cylinder and permit the piston and cross-head to lower under the action of gravity. When the motive fluid is introduced into the lower end of the cylinder under pressure, the crosshead, of course, and the load carried thereby, will be raised.

When the non-pressure head a and piston b are applied and held by the tool, as shown in Fig. 1, the piston head b will be projected and exposed where it can be readily worked upon for the replacement or repair of the above noted packing elements b-5 and b-6, and the interior of the non-pressure head a will be exposed so that it can be readily cleaned if required.

When the non-pressure head a and piston b are turned upside down or as shown by full lines in Fig. 2, and the head a is then secured in the anchoring segment as shown in Fig. 2, the piston head will then rest upon or just above the cross member 15 of the crosshead. Then when the crosshead is raised, the piston will be moved upward substantially as shown by dotted lines in Fig. 2, against the tension of spring b-2, and the upper end of piston rod will be projected so that its stop ring b-3 can be readily removed. When the piston is thus raised, as shown by dotted lines in Fig. 2, the packing clamping ring a-4 can be readily removed, thereby affording access to the packing a-3 for the removal, replacement or repair thereof.

I have found in practice that after the operations just described have been performed, the packing a-3 would be frictionally raised out of its seat by giving the crosshead and the piston structure a little further additional upward movement.

Preferably the next operation would be to lower the crosshead to the extreme position shown in Fig. 3, so as to draw the piston stem or rod b-1 completely out of the non-pressure head a, leaving the latter separated. While the non-pressure head is removed, it can be internally and externally cleaned and its air vent a-6 and its strainer can also be conveniently cleaned or replaced. While the non-pressure head is removed, spring b-2 can be readily removed and the said spring and the piston stem can be cleaned. After the non-pressure head has been replaced, as shown in Fig. 3, the crosshead and the piston structure will be raised so as to project the stem b-1 upward through the said head. To facilitate the entrance of the piston stem through the hub or contracted portion of the non-pressure head a, I have found it convenient to apply a contracted aligning cap 25 temporarily to the upper end of said piston stem. After the piston stem has been forced upward through the non-pressure head, cap 25 will be removed and the packing a-3 can be replaced in its seat and

around the piston stem. Then by a downward movement of the piston and stem, this packing thus applied will be frictionally drawn to the bottom of its seat and then the retaining ring a-4 should be reapplied.

The next step would be to reapply the stop ring b-3 thereby again connecting the piston and non-pressure head structures in cooperative relation ready for reapplication to the brake motor. It is important to note that the pins 21 and the holes therefor in the anchoring segment 12 and in the flange of the non-pressure head are diametrically opposite so that they will enter coincident holes regardless of whether the pressure head is turned upward as shown in Figs. 2 and 3 or downward as shown in Fig. 1.

Attention is also called to the fact that under upward movement of the crosshead, the aligning or centering fingers 20 will engage the somewhat tapered lower portion of the piston head and 20 initially center the same in respect to the head a.

In Figs. 4 and 5 the offset portion of the anchoring segment 12 is shown as rested on a bracket 26 of a table or adjacent support 27.

It may be noted that as a minor feature the guide posts or columns 10 are diametrically spaced in respect to the anchoring segment, and that the lock pins 21 which are also diametrically spaced, when inserted, will project downward into the posts.

What I claim is:

1. In a device of the kind described, spaced guide columns, a crosshead slidable on said columns, power means for reciprocating said crosshead, an internally grooved anchoring segment secured on the upper ends of said columns and adapted to receive the flange of a brake head such as described regardless of which side up said head is turned, and to hold said brake head aligned with the axis of a brake piston seated on said crosshead.

2. In a device of the kind described, spaced guide columns, a crosshead slidable on said columns, power means for reciprocating said crosshead, an internally grooved anchoring segment secured on the upper ends of said columns and adapted to receive the flange of a brake head such as described regardless of which side up said head is turned, and to hold said brake head aligned with the axis of a brake piston seated on said crosshead, said anchoring segment being extended through approximately 180° and having diametric pin holes, and in combination with pins insertable through said pin holes and through holes in the flange of said brake head.

3. The structure defined in claim 1 in which said crosshead has upright sleeves slidable on said columns and has a transverse connecting bar serving as a support for a piston axially aligned with said anchoring segment and brake head held thereby.

4. The structure defined in claim 2 in which the pin holes in said anchoring segment are axially aligned with said columns so that the inserted pins will project downward into said columns.

5. The structure defined in claim 1 in which said crosshead has upright sleeves slidable on said columns and has a transverse connecting bar serving as a support for a piston axially aligned with said anchoring segment and brake head held thereby, said sleeves at their upper portions having inwardly projecting aligning fingers located above the cross bar of said crosshead.

6. The structure defined in claim 1 in which the power means for moving said crosshead includes an anchored cylinder having a movable piston rod intermediately connected to said cross-
5 head.

7. The structure defined in claim 1 in which said crosshead has upright sleeves slidable on said columns and has a transverse connecting bar serving as a support for a piston axially
10 aligned with said anchoring segment and brake

head held thereby, and in which the power means for moving said crosshead includes an anchored cylinder having a piston connected to the intermediate portion of the cross bar of said cross-
head.

8. The structure defined in claim 1 in which said device additionally includes an aligning cap detachably applicable to the stem of the brake head manipulated by said crosshead.

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