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BRAKE BAND LINER PUNCHING, COUNTERSINKING, AND RIVETING APPARATUS

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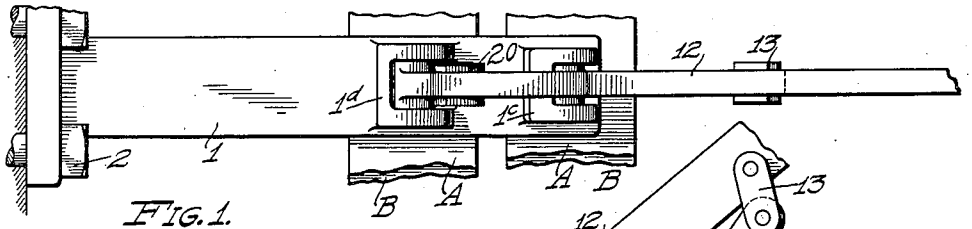


FIG. 1.

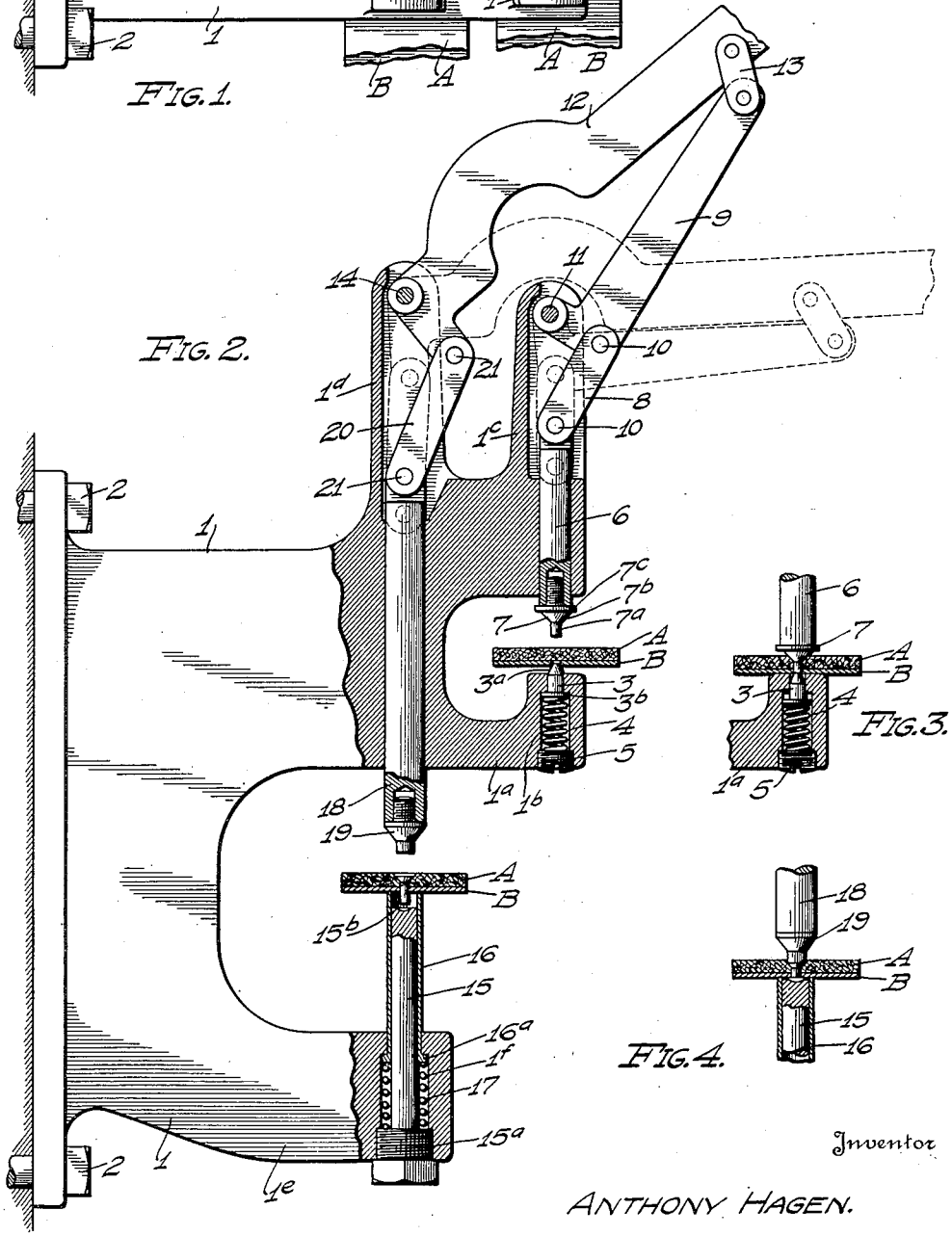


FIG. 2.

FIG. 3.

FIG. 4.

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UNITED STATES PATENT OFFICE.

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BRAKE-BAND-LINER PUNCHING, COUNTERSINKING, AND RIVETING APPARATUS.

Application filed November 27, 1923. Serial No. 677,317.

To all whom it may concern:

Be it known that I, ANTHONY HAGEN, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented a certain new and useful Brake-Band-Liner Punching, Countersinking, and Riveting Apparatus, of which the following is a specification.

My invention relates to a combined apparatus for punching and countersinking holes in liners for brake-bands and for riveting the liners to the same, and the objects of my invention are: First, to provide such an apparatus by which a rivet hole may be readily punched in the liner for a brake-band in alinement with the rivet hole in the band and by which the hole in the liner may be simultaneously countersunk to accommodate the head of a rivet; second, to provide an apparatus of this class by which a clean hole may be punched and countersunk in the liner and by which no severed or frayed ends of fabric are left exposed on the brake side of the liner; third, to provide an apparatus of this class by which a rivet, placed in the punched and countersunk hole of the liner and in the hole of the band, may be immediately and easily upset; fourth, to provide an apparatus of this class by which a rivet of common size may be upset in such a manner as to accommodate and fill different sizes of holes in the brake-band; fifth, to provide such an apparatus whereby the liner for one brake-band may be punched and countersunk while the liner of another brake-band may, at the same time, be riveted to its band; sixth, to provide a novelly arranged lever mechanism for simultaneously operating the punching and countersinking, and the riveting devices of my apparatus; seventh, to provide as a whole a novelly constructed apparatus of this class, and eighth, to provide such an apparatus which is very simple and economical of construction, durable, efficient, practical and which will not readily deteriorate or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon, which form a part of this application, in which:

Figure 1 is a plan view of my brake-band liner punching and rivet set apparatus, showing certain parts thereof broken away and showing fragmentary portions of brake-bands positioned on and in connection with the same; Fig. 2 is a side elevational view thereof showing certain parts and portions broken away and in section to facilitate the illustration and showing by dotted lines certain shifted positions of certain operating members; Fig. 3 is a fragmentary, sectional elevational view of the hole punching and countersinking device of my apparatus, showing the punching and countersinking member piercing and forming the hole in the brake-band liner in alinement with the hole in the brake-band, and Fig. 4 is a fragmentary, sectional elevational view of the riveting device of my apparatus, showing the same forming a head on the one end of the rivet extending through the brake-band and liner therefor.

Like characters of reference refer to similar parts and portions throughout the several views of the drawings.

The frame 1, bolts 2, pilot member 3, spring 4, plug 5, plunger 6, punching and countersinking member 7, link 8, lever 9, pins 10 and 11, operating lever 12, link 13, pin 14, rivet set member 15, sleeve 16, spring 17, plunger 18, head member 19, link 20 and the pin 21, constitute the principal parts and portions of my apparatus.

The supporting frame 1 of my apparatus is preferably secured to a wall or on any convenient standard by means of bolts 2. Said frame is provided with two bifurcated portions, the one at the lower inner portion thereof and the other positioned above and outwardly therefrom. At the outer end of the lower arm 1^a of the upper, outwardly positioned, bifurcated portion of the frame is reciprocally mounted a pilot member 3, which is provided with a substantially conically shaped, outwardly extending end 3^a and with an enlarged portion 3^b at its inner end which retains said pilot member in the supporting frame 1 and limits its outward movement, said enlarged portion 3^b being reciprocally mounted in an enlarged recess 1^b in said frame. A compression spring 4 is also positioned in said recess against the

enlarged portion 3^b of the pilot member and is retained in position against the same and in said recess by means of a plug 5 secured in said arm in alinement with said spring and pilot member. Positioned in alinement with and above the pilot member 3 and reciprocally mounted in the other arm forming the upper, outwardly positioned, bifurcated portion is a plunger 6, at the lower end of which is secured, preferably screwed, a combination punching and countersinking member 7. Said member 7 consists preferably of a straight piercing portion 7^a at its lower end, a frusto-conical countersinking portion 7^b adjacent thereto and an annular stop flange 7^c at the upper end of said frusto-conical portion. To the upper end of said plunger are pivotally connected links 8 by means of a pin 10, said links being pivotally connected at their opposite ends by means of another pin 10 with a lever 9. Said lever is pivotally mounted, near the end of the pivotal connection of the links 8, at the upper end of the upwardly extending supporting portion 1^c of the frame 1 by means of a pin 11. Said lever 9 is pivotally connected at its free end, by means of a link 13, with the operating lever 12 intermediate its ends, said lever being pivotally supported at its one end, by means of a pin 14, in another upwardly extending supporting portion 1^d at the upper end of the supporting frame 1.

In the outer end of the lower, outwardly extending arm 1^d of the lower bifurcated portion of the supporting frame is secured a rivet set member 15 by means of a threaded portion 15^a at the lower end of said member. A sleeve 16 is reciprocally mounted on and around the member 15, the lower end thereof being provided with an enlarged, annular portion 16^a, which retains the same in a certain position relatively to the forming or upsetting portion 15^b of the rivet set member, said forming portion consisting of a circular recess in the upper end of the member. The arm 1^e of the supporting frame 1 is provided with an enlarged hole 1^f surrounding the member 15 in which the enlarged portion 16^a is adapted to reciprocate and in which is positioned a compression spring 17, the ends of which are positioned against said enlarged portion 16^a and an enlarged, threaded portion 15^a of the rivet set member, which threaded portion retains the member 15 in the arm 1^e. It will be noted that the upper end of the sleeve 16 is spaced upwardly from the upper end of the member 15 when the operating lever is in a raised position and exerts a constant force against the under side of the brake-band, thereby insuring constant force between the rivet and brake-band when riveting the liner to the latter. Positioned in alinement with the members 15 and 16 is another plunger 18, at the lower end of which is secured a head member 19, which is adapted to engage the heads of the rivets for securing the brake liner to the band. At the upper end of the plunger 18 are pivotally connected the links 20 by means of a pin 21, which links are pivotally connected at their opposite ends to the operating lever 12 by means of another pin 21, substantially as shown in the drawings.

The metallic brake-band, indicated by B in the drawings, is positioned with its previously punched rivet hole over the conical portion of the pilot member 3 with the brake liner A positioned within or against the face of the band B. The operating lever 12 is then shifted from the position shown by solid lines to the downward position, shown by dotted lines in Fig. 2 of the drawings, the combination punching and countersinking member at the lower end of the plunger 6 forcing the liner and band downwardly against the upper portion of the arm 1^a and against the compression of the spring 4, piercing the brake liner A with the piercing portion 7^a of the member 7 and countersinking the same with the countersinking portion 7^b thereof. A soft metal rivet, such as copper, is positioned in the hole thus formed and the brake-band and liner with the rivet in position are then positioned on the upper end of the sleeve 16, as shown in Fig. 2 of the drawings. The operating lever 12 is then again shifted downwardly, the head member 19 at the end of the plunger 18 engaging the head of the rivet and forcing the same with the brake-band and liner downwardly against the compression of the spring 17, permitting the small end of the rivet to engage the forming portion 15^b at the end of the rivet set member 15, upsetting the end of the rivet and forming a head thereon, substantially as shown in Fig. 4 of the drawings.

It will be here noted that with my apparatus one person may punch and countersink the holes in the brake-band liner while at the same time another person may secure a brake-band liner to the band of another brake-band, thus economizing on time and energy.

It is obvious from this construction, as shown in the drawings and disclosed in the foregoing specification, that there is provided an apparatus for punching and countersinking brake-band liners and riveting the same to brake-bands as aimed at and set forth in the objects of the invention, and though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my

invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An apparatus of the class described, including a support, yieldable guide means mounted on said support, a punching and countersinking member mounted on said support in alinement with said guide means, a riveting means in connection therewith, and lever and link means connected with said punching and countersinking means and with said riveting means for simultaneously operating the same.

2. An apparatus of the class described, including a support, guide means mounted on said support, a piercing and countersinking member mounted on said support in alinement with said guide means, a riveting means mounted on said support, a lever pivotally mounted on said support and pivotally connected with said piercing and countersinking member, and an operating lever also pivotally mounted on said support, connected with said riveting means and also connected intermediate its ends with one end of said first mentioned lever.

3. An apparatus of the class described, including a support, a pilot member reciprocally mounted in said support and extending therefrom, a plunger reciprocally mounted in said support in alinement with said pilot member and provided at its end adjacent said pilot member with a combined piercing and countersinking member, and means for reciprocating said plunger.

4. An apparatus of the class described, including a support, a pilot member reciprocally mounted in said support and extending therefrom, a plunger reciprocally mounted in said support in alinement with said pilot member and provided at its end adjacent said pilot member with a combined piercing and countersinking member, a plunger means for upsetting rivets, and a lever and link means connected with said plungers for simultaneously operating the same.

5. An apparatus of the class described, including a support, a pilot member reciprocally mounted in said support and extending therefrom, a plunger reciprocally mounted in said support in alinement with said pilot member and provided at its end adjacent said pilot member with a combined piercing and countersinking member, a lever pivotally mounted on said support and pivotally connected with said plunger, a plunger means for upsetting rivets, and an operating lever pivotally connected to the end of said first mentioned lever and pivotally connected with said plunger means.

6. An apparatus of the class described, including a support, a conically shaped pilot member reciprocally mounted in said support, a spring means mounted in said support in engagement with said pilot member for forcing the same outwardly, a plunger reciprocally mounted in said support in alinement with said pilot member, a piercing and countersinking member secured to the one end of said plunger, a lever pivotally mounted on said support, and a link pivotally connecting said lever with the opposite end of said plunger.

7. An apparatus of the class described, including a support, a conically shaped pilot member reciprocally mounted in said support, a spring means mounted in said support in engagement with said pilot member for forcing the same outwardly, a plunger reciprocally mounted in said support in alinement with said pilot member, a piercing and countersinking member secured to the one end of said plunger, a lever pivotally mounted on said support, a link pivotally connecting said lever with the opposite end of said plunger, and a riveting means in connection therewith and operable simultaneously therewith.

8. An apparatus of the class described, including a support, a conically shaped pilot member reciprocally mounted in said support, a spring means mounted in said support in engagement with said pilot member for forcing the same outwardly, a plunger reciprocally mounted in said support in alinement with said pilot member, a piercing and countersinking member secured to the one end of said plunger, a lever pivotally mounted on said support, a link pivotally connecting said lever with the opposite end of said plunger, a riveting means in connection therewith, and an operating lever pivotally mounted on said support and pivotally connected with said riveting means and also pivotally connected with the extended end of said first mentioned lever.

In testimony whereof, I have hereunto set my hand at San Diego, California, this 22nd day of November, 1923.

ANTHONY HAGEN.