March 11, 1930. A. O. WISTI 1,750,144

BRAKE LINING MACHINE

Filed April 12. 1928 2 Sheets-Sheet 1

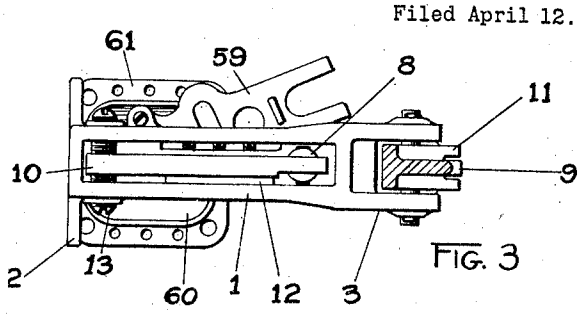



FIG. 3

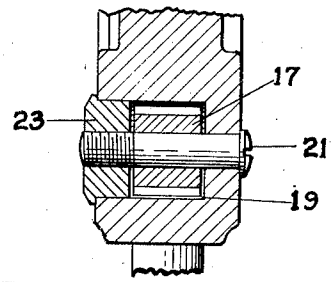



FIG. 7




FIG. 1




FIG. 5

FIG. 6

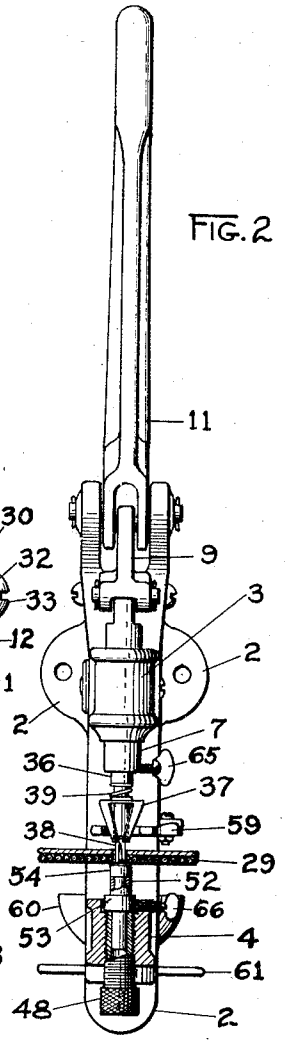



FIG. 2

Inventor

ANDREW O. WISTI

By Owen H. Spencer

Attorney

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BRAKE LINING MACHINE

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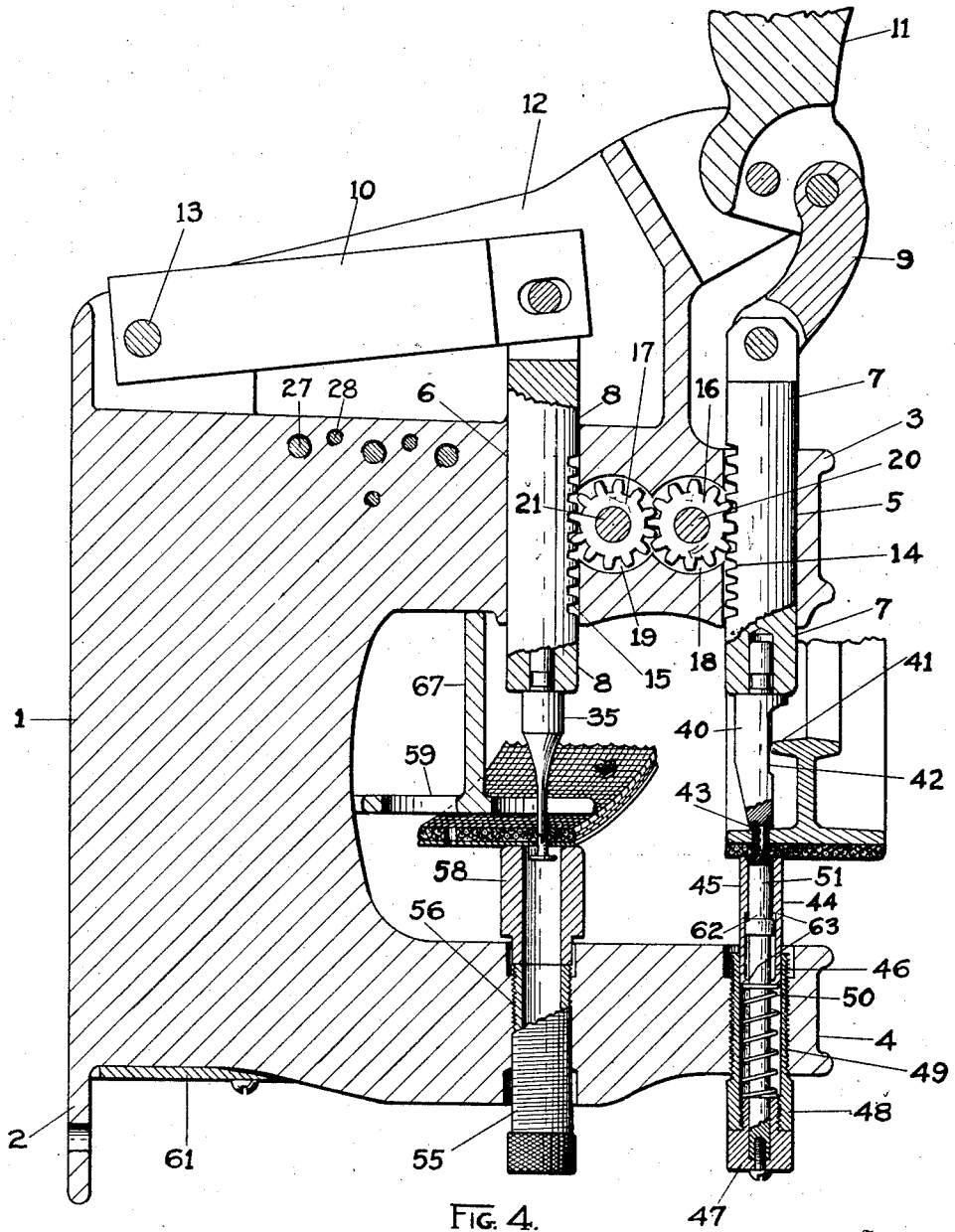



FIG. 4.

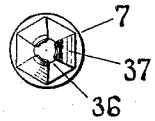



FIG. 8.

Inventor

ANDREW O. WISTI

By Owen H. Spencer

Attorney

Patented Mar. 11, 1930 1,750,144

# UNITED STATES PATENT OFFICE

ANDREW O. WISTI, OF INDIANAPOLIS, INDIANA

## BRAKE-LINING MACHINE

Application filed April 12, 1928. Serial No. 269,467.

This invention relates to machines for relining brake shoes, clutch faces, or the like, and one feature of the invention is the provision of means operated from a single source, for trimming, removing from, and applying facings to brake bands and clutch faces.

A further feature of the invention is the provision of means for adjusting the various elements of the device for obtaining accuracy in operation.

A further feature of the invention is the provision of a plurality of attachments and means for applying the same, whereby a multiplicity of operations may be performed on the one machine.

A further feature of the invention is the provision of adjustable means for stripping the bands or the like from the tools after the tool has been forced thru the same.

Other objects and advantages will be hereinafter more fully set forth and pointed out in the accompanying specification.

In the accompanying drawings which are made a part of this application,

Figure 1 is a side elevation of the machine, partly in section, showing the manner of removing linings or facings and of putting holes thru the linings and trimming the linings in sections;

Fig. 2 is a front elevation of the machine, partly in section, showing one manner of supporting and applying rivets;

Fig. 3 is a top plan view of the machine, partly in section;

Fig. 4 is an enlarged detail sectional side view thru the machine, showing another manner of applying, and also showing the means for removing rivets;

Fig. 5 is an enlarged detail section as seen in the proximity of lines 5—5, Fig. 1;

Fig. 6 is a similar view as seen in the proximity of line 6—6, Fig. 1; and

Fig. 7 is a sectional view as seen in the proximity of line 7—7, Fig. 1; and Fig. 8 is a detail view.

Referring to the drawings in which similar reference characters designate corresponding parts thruout the several views, the numeral 1 indicates the frame of the machine, having screw or bolt receiving ears 2 thereon, by means of which it may be secured to a post, wall or other such supporting means. The upper portion of the frame 1 is provided with a head 3 and the lower portion with a base 4, one in line above the other. The head 3 is provided with vertical bores 5 and 6, thru which extend plungers 7 and 8, respectively, the upper end of the plunger 7 being pivotally attached to one end of a link 9, while the upper end of the plunger 8 is pivotally attached to one end of a shearing blade 10. The upper end of the link 9 is pivoted to an operating lever 11, which is in turn pivoted to a dual journal structure which extends upwardly from the head 3, and straddles said lever which is arranged in such manner that when swung downwardly or upwardly the plunger 7 will be lowered or raised, by the toggle action of the link 9 with said lever.

The shearing blade 10 operates in a longitudinal slot 12 in the head 3, and the outer end thereof is pivotally mounted on a bolt 13 extending transversely thru the slot 12 and walls extending in dual manner from the head 3, so that when the plunger 8 is lowered or raised, the blade 10 will swing on the bolt 13 and the inner end thereof be lowered or raised in shearing action. In order to operate both plungers from the lever 11, and simultaneously, said plungers are provided with racks of teeth 14 and 15, which engage coordinately with the meshed timed gears 16 and 17, respectively, which are housed in adjoining cavities 18 and 19 in the head 3. The gears 16 and 17 are mounted upon shafts 20 and 21, which pass transversely thru the adjacent wall of the head 3 and thread into retaining blocks 22 and 23, said blocks entering the open ends of the cavities 18 and 19, and being held against rotation by providing them with flat faces 24 and 25 on the peripheries of the blocks, which abut against each other. With this construction it will be seen that when the lever 11 is operated to raise or lower the plunger 7, the plunger 8 will be simultaneously raised and lowered by means of said gears.

Cooperating with the shearing blade 10 is a mate shearing plate 26, which is adjustably mounted on the face of the frame 1, in cutting relation with the same. Clamping

screws 27 hold the plate in position on the frame, while adjusting screws 28 are threaded thru the frame 1 and bear against the inner face of the plate in opposition to the screws 27, for adjusting the plate to a suitable cutting angle and position on the side of the frame 1, with respect to the blade 10. As the plate 26 cooperates with the blade 10 for cutting and shearing the lining fabric 29, means is provided for adjusting said blade with respect to the adjusted position of the plate and to this end a hollow exteriorly threaded sleeve 30 is threaded thru one wall of the frame 1 (see Fig. 5), and is screwed inwardly until the blade 10 is brought into proper shearing relation with the plate 26, the end of the bolt 13 being held in alignment by having a sliding fit within the sleeve 30. After said sleeve has been properly adjusted, the bolt 13 is screwed inwardly until the shoulder 31 thereof embraces the opposite face of the blade 10. A locking bolt 32 which is threaded into the end of the bolt 13, enters in the sleeve 30 until the head 33 of the bolt 32 bears against the end of the sleeve 30, thus locking said sleeve and bolt 31 against rotation with each other, but permitting them to be revolved and adjusted as a unit with said bolt, for quickly shifting the blade 10 laterally toward or away from the plate 26.

Heretofore considerable time and labor has been required in removing old vehicle brake linings and applying new ones, but with the present device this work may be expeditiously and accurately accomplished by providing the proper bit and anvil for cooperation with the plungers 7 and 8. In Fig. 1 a chisel 34 is shown attached to the plunger 7, used primarily for cutting rivets when an old lining is being removed from the brake band, while a punch 35 is shown attached to the plunger 8 and making rivet openings thru the lining 29.

In Fig. 2 a combined rivet holder and riveting bit 36 is shown attached to the plunger 7, the holder comprising a plurality of spring arms 37, which grip the head of the rivet 38 and guide it thru the desired hole in the lining 29 or other work. The holder 37 is slidably mounted on the bit 36, so that when the rivet is forced downwardly to its limit, said holder will be restricted against complete downward movement by its contact with the work, and be thus released from the rivet. An expansion coil spring 39 normally holds said spring arms in lowered position, being disposed around the bit 36 above the connecting web of said arms. In Fig. 4, a special form of riveting bit 40 is shown attached to the plunger 7, while the punch 35 attached to the plunger 8 is shown as removing a rivet from a vehicle brake band and lining. In certain makes of brake bands a reinforcing rib 41 is formed thereon, which projects into the path of the ordinary riveting bit, hence the bit 40 is provided with a recess 42 in one face thereof within which said rib clears and permits said bit to engage the rivet.

The riveting bit 40 may be constructed similar to the bit 36, with the exception of the recess 42, but in the present instance the bit 40 is constructed to upset a tubular or other rivet 43, the spring arms 37 being omitted, and the end of the rivet embracing the bit instead of the head. When a rivet of this class is used a tubular holder 44 is provided, consisting of a sleeve 45 slidably mounted on a rod 46, the latter being removably secured to a head 47, which threads into the lower end of a bushing 48, which in turn threads thru an opening 49 in the base 4. The sleeve 45 is normally held in extended position by means of an expansion spring 50 surrounding the plunger between the end of the sleeve and the head 47, to provide a receptacle for the tubular or other such rivet 43, and gradually moves downwardly to expose the rivet as the bit 40 applies pressure to upset the end of same. A clinching anvil 51 is conveniently formed on the end of the rod 46, to support the rivet against the thrust of the bit 40.

When a split rivet is used, as shown in Fig. 2, a shank 52 is entered in the upper end of the bushing 48, a shoulder 53 thereon limiting the downward movement thereof. A clinching anvil 54 is also provided in the end of the sleeve 52 for upsetting or spreading the split ends of the rivet.

Referring to Fig. 1 and Fig. 4, a bushing 55 is also threaded thru an opening 56 in the base 4 for receiving implements for cooperation with the tools operated by the plunger 8, a die 57 being shown attached thereto in Fig. 1 and a knockout sleeve 58 in Fig. 4. The bushings 48 and 55 are adjustable thru the base 4 so that they may be positioned to receive tools of varying heights and properly position the work for receiving the punches and the like.

Pivotally mounted at one side of the frame 1 is a stripper plate 59 having a pair of fingers at its outer end adapted to extend on opposite sides of the tool carried by the plunger 8, so that on the upward stroke of said plunger, the work will be stripped from the tool, but when said plunger is utilized for other purposes than punching operations, or when the work is being mounted upon or removed from the machine, the stripper plate is swung out of the path of the plunger 8, as shown in Fig. 3.

The frame 1 may be provided with pockets 60 and holder 61 in which the various rivets and tools may be placed when not in use, so that they will not become lost.

With this invention, the old brake lining may be removed and a new one applied without changing the tools in the machine, as the punching and rivet removing operation

may be performed by the tools associated with one plunger, while the riveting operation may be performed with the tools associated with the other plunger. Likewise, the lining may be cut in proper lengths by the shearing mechanism, thus saving time and labor as well as having all the implements necessary for relining the brake bands, clutch faces and the like, assembled in one machine.

A mid-point of the rod 46 is slightly enlarged, forming a shoulder 62, and the sleeve 45 is correspondingly smaller in diameter at both its ends, thus forming shoulders 63, by which arrangement the lower shoulder 63 is brought against the shoulder 62 by the action of the spring 50, when the apparatus is idle, said shoulders 63 serving to thus keep the sleeve 45 from being pushed entirely off of the rod 46, in either direction.

Referring to Fig. 1, a flared anvil 64 is provided over the sleeve 48, being adjusted by the same for suitable working height in cutting rivets with the chisel 34, as desired. The anvil 64 may be used, however, for different purposes in the somewhat universal use of the machine for which it is adapted. Thumb screws 65 are threaded transversely into the plungers 7 and 8 to afford a convenient means for retaining different bits and tools in the same, and similar screws 66 are also provided in the base 4 to lock the die 57, shank 52, and other implements, as desired.

While the draftsman has found it convenient to show the rivet knockout sleeve 58 in use, in Fig. 4, and the tubular rivet holder 44, in use in the same view, it is understood that in the majority of instances it is not necessary to make use of the plungers 7 and 8 simultaneously. For example, when the plunger 7 is used, the plunger 8 and the blade 10 ordinarily run idle, and conversely. That is to say, that said plungers and blade are intended for somewhat independent use in getting out the same job of work. For example the rivet removing operation is carried out by using the punch 35 in the plunger 8, with the sleeve 58 as shown in Fig. 4. A new lining is then cut off to the right length by means of the blade 10. Rivet receiving holes for the new lining could then be punched by substituting the die 57 for the sleeve 58, as shown in Fig. 1. The rivets could then be conveniently applied in such manner as shown in Fig. 2 and Fig. 4 by use of the plunger 7.

The stripper plate 59 is provided with a standard 67 which terminates in an abutting relation with a point of the frame 3, and in the stripping action, said standard serves as a brace to save the stripper from undue strain.

Fig. 8 is a detail view of the spring arms 37 as seen looking upward under same. Said spring arms are more than two in number and preferably three being tensioned inwardly to grip the head of the rivet 38 at substantially equi-distant points and thus centralize the same in respect to the anvil 54.

While the description and drawings illustrate in a general way certain instrumentalities which may be employed in carrying the invention into effect, it is evident that many modifications may be made in the various details, without departing from the scope of the appended claims, it being understood that the invention is not restricted to the particular example herein described.

I claim as my invention:

1. In a machine for relining brake shoes and the like, a frame structure; a pair of plungers; tools attached to said plungers; a lever mechanism for operating one of said plungers, and a pair of intermeshing gears for operating the other plunger simultaneously with the lever operated plunger.

2. In a machine for relining brake shoes and the like, a frame structure; a pair of plungers movably mounted on said frame; a lever arrangement for operating one of said plungers, gear means interposed between said plungers for operating the second plunger when the first plunger is operated; a shearing mechanism pivoted at one end to said frame; and means for operating said shearing mechanism from the gear operated plunger.

3. In a machine for relining brake shoes or the like, a pair of plungers; teeth on said plungers; a lever construction for operating one of said plungers; and a pair of intermeshing gears interposed between said plungers and cooperating with said teeth for causing the other plunger to operate in unison with the lever operated plunger.

4. In a machine for relining brake shoes or the like; a pair of tool holding plungers; teeth on said plungers; a lever construction for operating one of said plungers; a pair of intermeshing gears interposed between said plungers and engaging the teeth thereof for causing the second plunger to operate with the lever operated plunger; and adjustable means for retaining objects in position to be operated on by the tools carried by said plungers.

5. In a machine for relining brake shoes or the like, a frame having a head and a base each having a pair of openings, one opening of each pair being in the same horizontal plane with the other opening of the same pair whereby an object may be moved laterally from over one opening to position over the other opening; plungers in the openings of the head; tools for cooperation with said plungers; means for operating both plungers in unison; bushings carried in the openings in the base, tools for cooperation with said bushings and means for adjusting said bushings whereby the tools carried thereby may be

adjusted with respect to the tools carried by said plungers.

6. In a machine for relining brake shoes and the like, the combination with tool holding plungers, and means for operating the same, of a shearing blade pivoted at one end to one of said plungers; a shearing plate for cooperation with said blade; means for adjusting the relative position of said shearing plate; and means for adjusting said shearing blade with respect to the shearing plate.

7. The combination with a machine for relining brake bands and the like, of a shearing device comprising a shearing blade, means for pivotally and adjustably attaching one end of the blade to parts of said machine; an operating mechanism for said machine, means for attaching the opposite end of said blade to said machine operating mechanism, whereby the blade will be operated thru the operation of said mechanism; a shearing plate associated with said blade; and means for adjustably mounting said plate on said machine.

8. The combination with a machine for relining brake bands and the like, of a cutting blade pivoted at one end to said machine; a support for said cutting blade formed to straddle the pivoted portion of said blade with dually arranged bosses; a screw means threaded thru one of said bosses and having a reduced end portion extending into the other boss; a shoulder formed on said screw end portion at the juncture of the reduced end portion; a sleeve threaded into said other boss, and fitting over the end portion of said screw; and a screw threaded into the reduced end of said screw, the head of which embraces said sleeve.

In testimony whereof, I have hereunto set my hand on this the 9th day of April, A. D. 1928.

ANDREW O. WISTI.