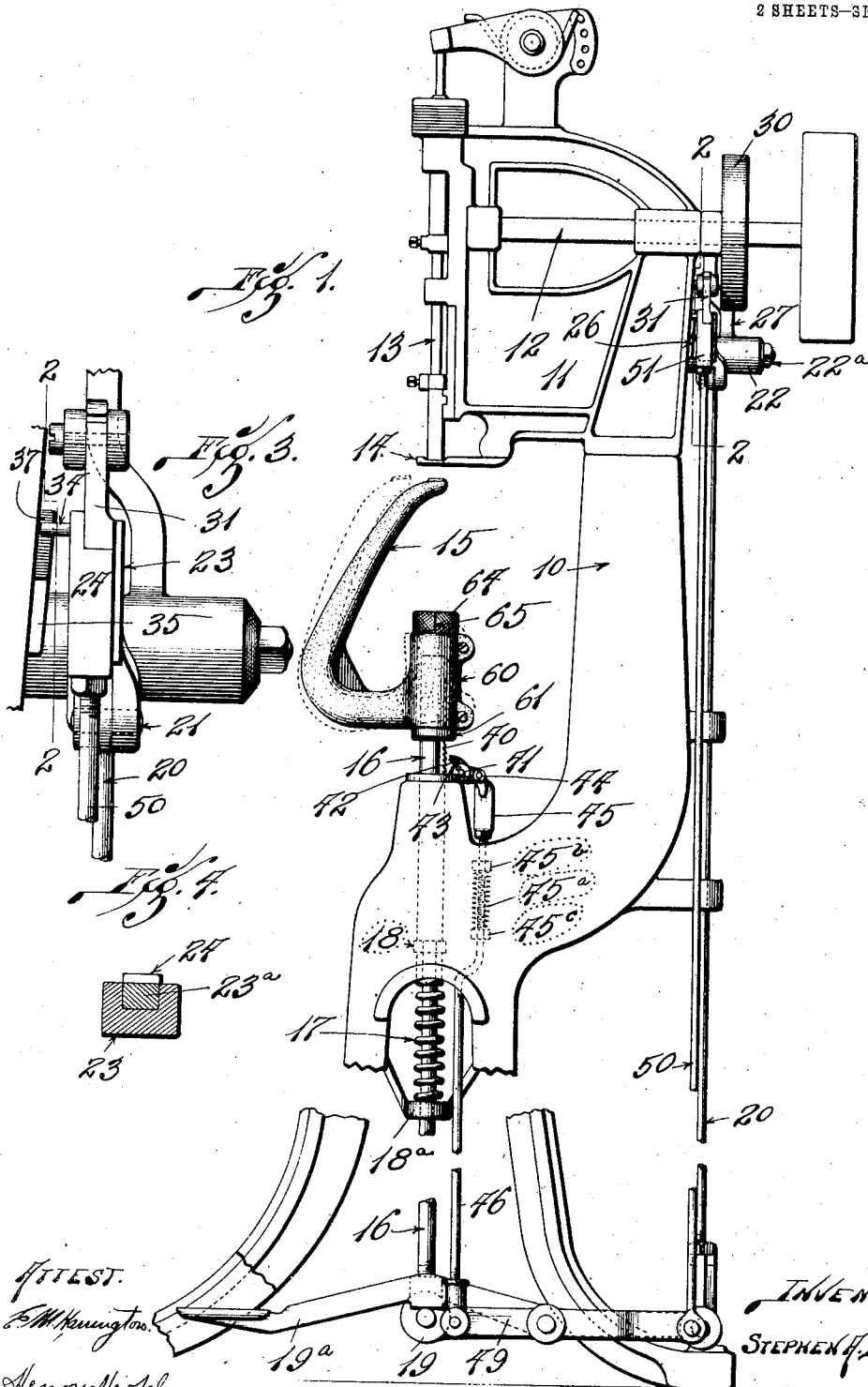


S. A. DOBYNE,
 WORK SUPPORT FOR NAILING MACHINES.
 APPLICATION FILED MAR. 26, 1912.

1,058,663.

Patented Apr. 8, 1913.

2 SHEETS—SHEET 1.



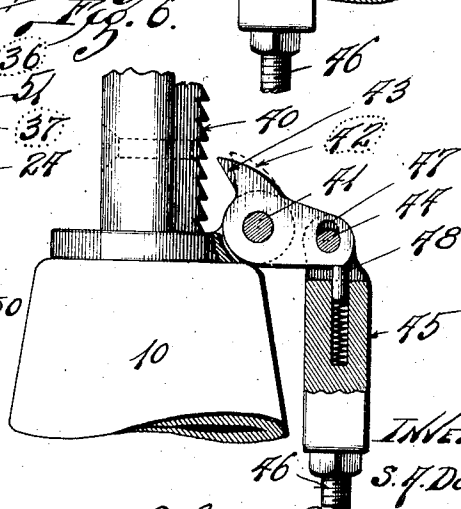
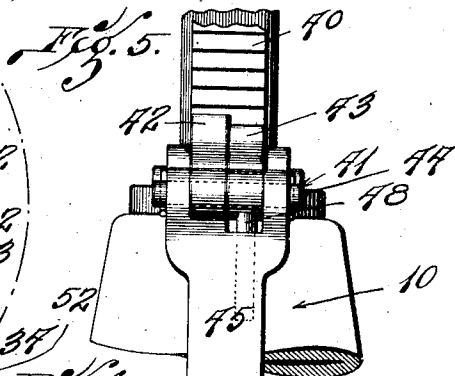
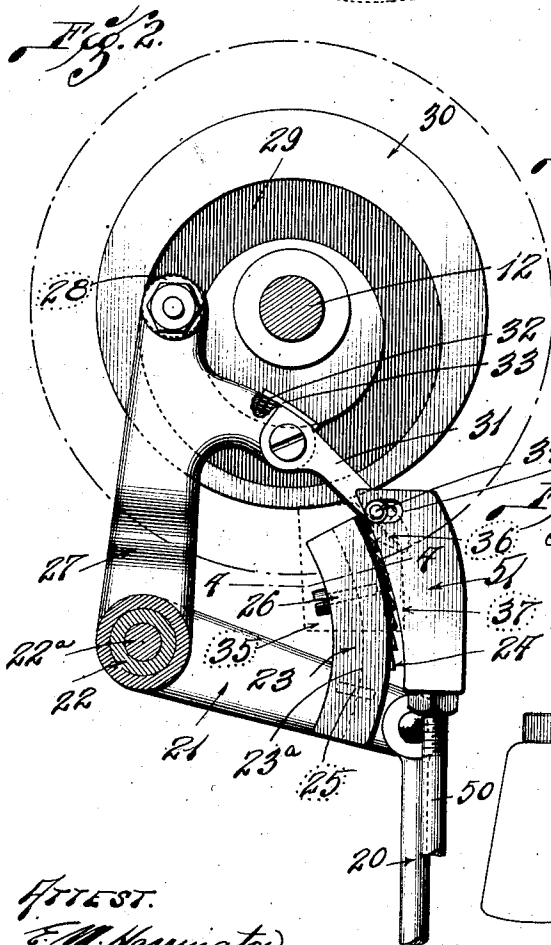
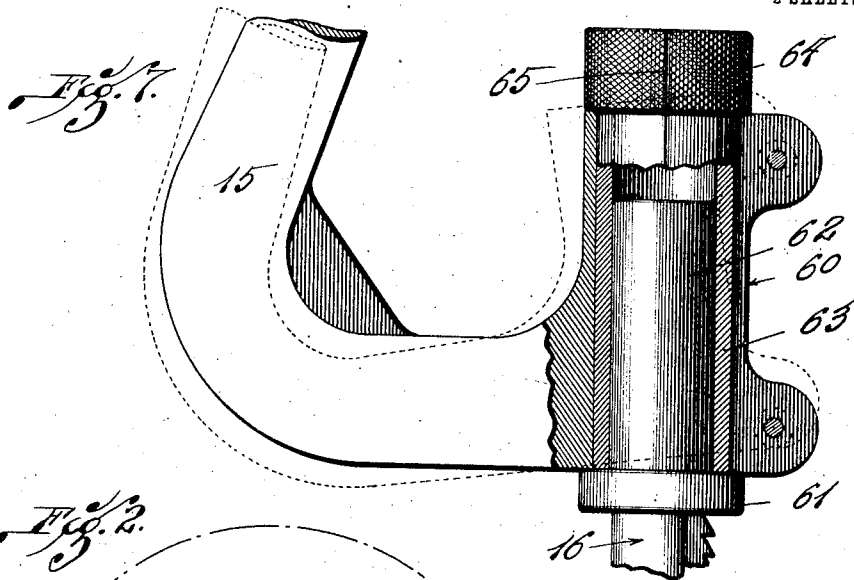
WITNESSES:
 S. M. Huntington
 Henry K. Kiesel

INVENTOR
 STEPHEN A. DOBYNE

BY John H. Brunninge

1,058,663.

·2 SHEETS—SHEET 2.



FINEST.
 F. M. Harrington.
 Henry Herkel

INVENTOR.
S. F. DOBYNE.
By John N. Brunninge atty.

UNITED STATES PATENT OFFICE.

STEPHEN A. DOBYNE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CHAMPION SHOE MACHINERY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

WORK-SUPPORT FOR NAILING-MACHINES.

1,058,663.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed March 26, 1912. Serial No. 686,422.

To all whom it may concern:

Be it known that I, STEPHEN A. DOBYNE, a citizen of the United States, and residing at St. Louis, in the State of Missouri, have
5 invented certain new and useful Improvements in Work-Supports for Nailing-Machines, of which the following is a specification.

This invention relates to work supports,
10 and more particularly to work supports for fastener inserting machines, such as nailing machines.

A fastener inserting machine, such as used in the manufacture of shoes, is usually provided with a horn for supporting the shoe while being operated upon by the fastener inserting mechanism to insert a row of fasteners, and with means for feeding the work over the horn. In such a machine, means
20 must be provided for depressing the horn to relieve the pressure on the work while this work is being fed, and the horn must be supported against depression while the fasteners are being inserted.

One of the objects of this invention therefore is to provide novel means for depressing the horn during the feed, and to provide means for positively supporting and locking the horn against downward movement while the fasteners are being inserted.
30

A fastener inserting machine for shoes is generally provided with a variety of horns, such as a curved horn used for sole attaching, etc., and a straight horn for slugging etc. This requires that the horn be removable so that a horn of a different form may be placed on the horn spindle. It is also often necessary to remove the horn for other reasons. As the horn tip is however directly below the work plate or presserfoot, and since the horn spindle is also below this presserfoot, there is not enough space between the tip of the horn and the presserfoot to permit this horn to be removed from its spindle, even if the horn is depressed to its lowest limit. It has therefore been necessary to provide a complicated construction, such as a hinged connection between the horn and its spindle constructed to permit
40 the horn to be swung laterally to allow its tip to clear the presserfoot so that the horn could be removed.

Another object of this invention therefore is to provide simple means whereby the horn
55 may be readily removed from its spindle,

which means is so arranged as to firmly support the horn against lateral movement when in position so as to firmly hold the tip in alinement with the fastener inserting mechanism at the same time permitting the horn
60 to rotate.

Further objects will appear from the detail description taken in connection with the accompanying drawings in which:

Figure 1 is a side elevation of a fastener
65 inserting machine embodying this invention, Fig. 2 is a section on the line 2—2 Figs. 1 and 3, Fig. 3 is a detail side elevation of the mechanism shown in Fig. 2, Fig. 4 is a section on the line 4—4 Fig. 2, Fig. 5 is a
70 detail rear elevation of the horn locking means, Fig. 6 is a detail side elevation of the mechanism shown in Fig. 5, and Fig. 7 is a detail side elevation partly in section showing the connection between the horn and its
75 spindle.

Referring to the accompanying drawings, 10 designates a stand or column supporting a machine head 11 which has mounted thereon a main drive shaft 12. A driver bar 13
80 operated from the shaft is supported on the head, and 14 designates a work plate or presserfoot against which the work is held. The fastener inserting mechanism may be of any suitable construction.
85

A horn 15 of usual construction is supported on a horn spindle 16 mounted for vertical movement in bearings on the stand 10, and held in raised position by means of a spring 17 (which is preferably a strong
90 spring) on the spindle bearing at one end against an adjustable nut 18 and at its other end against a bracket 18^a on the stand. The lower end of the spindle is pivoted to one end of a lever 19 mounted on the stand,
95 and the other end of this lever is connected to one end of a link 20. The other end of the link 20 is pivotally connected to the end of an arm 21 having a hub 22 mounted on a stud 22^a on the machine head 11. The arm
100 21 has an arc-shaped lug 23 thereon arranged concentric with the pivot of the lever. This lug 23 is channeled as shown in Fig. 4 to receive a rack 23^a having ratchet teeth 24 thereon. This rack is held in position by means of a dowel 25 and a bolt 26.
105 An arm 27 is mounted on the hub 22 and is provided with a cam roll 28 engaging a cam groove 29 in the cam wheel 30, rigidly connected with the shaft 12. The arm 27
110

has pivotally mounted thereon a hooked pawl 31 adapted to engage the rack 23^a and thrown in engagement therewith by means of a spring 32 engaging an extension 33 on the pawl. A pin 34 on the pawl 31 bears on a cam plate 35 secured to the head 11 and provided with a cam portion 36 and with a straight idle portion 37.

During the operation of the machine the cam wheel 30 will oscillate the arm 27 and move the pawl thereon over the rack 23^a. While the pin 34 is on the idle portion 37 of the cam plate, the pawl will be held out of engagement with the rack, but as this pin moves upwardly on the cam portion 36, the pawl will drop into engagement with the rack and further movement of the arm 37 will cause this arm to carry the arm 21 with it and depress the horn against the action of its spring 17. As the arm 37 moves back, the pin 34 will ride up on the cam portion 36 and disengage the pawl from the rack so as to allow the spring 17 to elevate the horn and permit the same to adjust itself according to the thickness of the work. It will be seen therefore that the horn is depressed a predetermined distance irrespective of the thickness of the work, and is released automatically to permit the same to adjust itself according to the varying thickness of the work. A treadle 19^a is provided for manually depressing the horn for the purpose of removing and replacing the work.

The horn depressing mechanism is so timed with relation to the fastener inserting and feeding mechanism that the horn is depressed during the feed, and released prior to the operation of the fastener inserting mechanism so as to permit the spring 17 to hold the horn and the work against the presserfoot 14. Where the spring 17 is strong enough to support the horn against the action of the fastener inserting machine, no auxiliary supporting means need be provided. In some classes of work however, where the leather is hard, it is desirable to provide additional supporting means. This will now be described.

Referring to Figs. 1, 5 and 6, 40 designates a rack secured to the horn spindle 16 and movable therewith. The stand 10 has mounted thereon a bracket which supports a pin 41 forming a pivot for a pair of pawls 42 and 43 arranged to engage the rack. The tails of the pawls are connected through a pin 44 with a block 45 mounted on a vertical link 46. The hole in the tail of the pawl 42 is of the same diameter as the pin 44, but the hole 47 in the tail of the pawl 43 is elongated as shown in Fig. 6, and a spring pressed plunger 48 normally holds the pawl 43 in such position that it is normally positioned in advance of the pawl 42 as shown in Figs. 5 and 6. A spring 45^a is mounted

on the link and bears at one end against a nut 45^b on the link and at its other end against a lug 45^c on the stand; this spring tends to elevate the link and throw the pawls 42 and 43 into engagement with the rack 40. The link 46 is connected with one end of a lever 49 mounted on the stand 10, and the other end of the lever is connected with a link 50 having a block 51 connected by a slot 52 with the pin 34 on the pawl 31. During the operation of the arm 27 and the pawl 31 connected therewith in depressing the horn, the pawls 42 and 43 will be operated in timed relation therewith to lock and release the horn. As the arm 27 moves clockwise Fig. 2 to release the pawl 31 from the rack 23^a, the block 51 will move downwardly with the pawl under the tension of the spring 45^a. The construction of the parts is such that after the pawl 31 is fully disengaged from its rack, and while the pin 34 is moving on the idle portion 37 of the cam plate 35, the pawls 42 and 43 will be thrown into engagement with the rack 40 by means of the spring 45^a. As the arm 27 moves back to engage the pawl 31 with the rack 23^a, and while the pin 34 is traveling on the idle portion 37, the pawls 42 and 43 are disengaged from the rack 40. The construction is such that the pawls 42 and 43 are fully disengaged from the rack 40 before the pawl 31 engages with the rack 23^a so that the horn will be fully unlocked before the depressing mechanism operates to depress the horn. The horn depressing and locking mechanism operate in timed relation with the fastener inserting and work feeding mechanism, so that the horn will be unlocked and depressed during the feed of the work, and elevated and locked during the fastener inserting operation. The horn is thus positively depressed during the feed and positively locked during the fastener inserting operation. The pawls 42 and 43 are of slightly different lengths as shown in Fig. 6 and are thus displaced one with respect to the other so as to provide for a fine feed. The pawl 43 is held in advance of the pawl 42 by the spring plunger 48. The pawl 43 will thus engage the rack before the pawl 42 and engage a tooth if the horn is in such a position that a tooth in the rack is in proper cooperative position with respect to the pawl 43. If however the tooth opposite the point of the pawl 43 is too high or too low, then the pawl 42 will engage the rack and the tooth thereon, the plunger 48 yielding while the pawl 42 is moved into engagement with the rack by the spring 45^a. It will be understood that the spring 45^a is stronger than the spring actuating the plunger 48. The above construction provides means for positively insuring an engagement of the proper pawl with its rack. By connecting the horn locking means with

the pawl 31, the depressing and locking means are operated by a common actuator, thereby preventing accidental failure of the unlocking means while the depressing means continues in operation. This avoids breakage and will cause wear of the actuator to effect both mechanisms equally. The channeled construction of the lug 23 and the inserted rack 23^a results in a cheap construction. It is sometimes necessary to remove the horn from its spindle. Since however the horn tip as well as the spindle are directly below the presser foot, and since it is desirable to have a long bearing connection between the horn sleeve and its spindle, this construction has required a horn having a very long depression and therefore a long spring, or a complicated connection such as a pivotal connection between the horn sleeve and its spindle, resulting in a loose connection having not the desired lateral rigidity. In accordance with this invention the connection between the horn and its spindle is made in a simple manner.

Referring to Figs. 1 and 7, 60 designates the horn sleeve which is split as shown and provided with clamping screws, and 61 designates a collar formed on the horn spindle 16 and providing a comparatively long shank 62 for connection with the horn sleeve and a shoulder therefor. The bore of the horn sleeve is made larger than the horn spindle shank 62 so that considerable space is left between this sleeve and shank. A sleeve 63 having a knurled head 64, and split longitudinally as shown at 65, is arranged to be inserted between the shank and the horn sleeve. The sleeve is split along one side only so that it can be contracted to decrease both its inside and outside diameters. The inside and outside faces of the sleeve 63 and the shank and the horn sleeve are accurately machined and preferably ground so as to provide an accurate and smooth fit between these parts, thereby supporting the horn rigidly against lateral movement but at the same time permitting it to be freely turned on its spindle. When the sleeve 63 is in position as shown in full lines in Fig. 7, the horn will be connected with its spindle through a firm and rigid joint, thereby firmly supporting the horn against lateral movement on its spindle. The split construction of the sleeve 63 furthermore permits the joint to be made as tight as desired by clamping the horn sleeve, as the horn sleeve may be clamped to clamp the sleeve 63 and this sleeve 63 is in turn contracted to clamp the horn spindle. The parts are however so constructed that the sleeve 63 may be removed and replaced by hand without requiring loosening of the clamping screws for the horn sleeve, and when in place the connection is a rigid one laterally. If the sleeve 63 is removed, the

horn can be tipped on its spindle so as to permit its tip to be moved out of alinement with the presserfoot 14 as shown in Figs. 1 and 7, thereby enabling the horn to be removed. Similarly another horn can be replaced, and when in position with the sleeve 63 in place, will be maintained rigidly laterally in operative relation with respect to the spindle and the fastener inserting mechanism, but can be rotated on its spindle. It will therefore be seen that this invention provides a very simple construction, whereby the horn can be replaced and removed at pleasure, and when in position will be firmly and rigidly supported against lateral movement so as to hold the clenching anvil on the horn tip in proper position with respect to the fastener inserting mechanism at the same time permitting free rotation of the horn as is necessary in these machines.

It is obvious that various changes may be made in details of construction without departing from the spirit of this invention, and it is therefore to be understood that this invention is not to be limited to the specific construction shown and described.

Having thus described the invention what is claimed is:

1. In a machine of the class described, a horn, a pivoted arm connected to said horn and having a rack thereon, a second pivotally mounted arm having a pawl thereon constructed to engage and disengage from said rack, means operating automatically during the operation of the machine to engage said pawl with said rack during the movement of said second arm in one direction and to disengage said pawl from said rack during the movement of said second arm in the opposite direction, and means for swinging said second arm positively in both directions.

2. In a machine of the class described, a horn, a pivoted arm connected to said horn and having a rack thereon, a second pivotally mounted arm having a pawl thereon constructed to engage said rack, means for operating said second arm, and means for automatically disengaging said pawl from said rack during each cycle of operation of the machine.

3. In a machine of the class described, a horn, a pivotally mounted arm connected to said horn and having a rack thereon concentric with the pivot of said arm, a second arm pivoted concentric with said first arm and having a pawl thereon constructed to engage said rack, means for oscillating said second arm, and means for automatically disengaging said pawl from said rack during each cycle of operation of the machine.

4. In a machine of the class described, a horn, a pivotally mounted arm connected to said horn, a channel cut in said arm concentric with the pivot of said arm, a rack se-

cured in said channel, a pawl constructed to engage said rack, and means for operating said pawl.

5 5. In a machine of the class described, a horn having a spring for raising the same, a rack connected to said horn, a lever having a pawl thereon constructed to engage said rack, means connected with said lever for locking said horn against downward movement, and means for operating said lever constructed to successively depress said horn, release the same to permit it to adjust itself to the thickness of the work thereon, and then lock the same against downward movement.

15 6. In a machine of the class described, a horn having a horn spindle, a spring on said spindle for raising said horn, a rack connected to said horn, a lever having a pawl thereon constructed to engage said rack, a rack on said spindle, a pawl constructed to engage said rack and connected with said lever, and means for operating said lever and cooperating therewith constructed to successively depress said horn, disengage the pawl on said lever from its rack to release said horn and permit it to adjust itself to the thickness of the work thereon, and then operate said second pawl to engage its rack and lock said horn against downward movement.

30 7. In a machine of the class described, a horn, a rack connected with said horn, a plurality of pawls constructed to engage said rack, one of said pawls being positioned in advance of the other, actuating means for said pawls having a yielding connection with one of said pawls, and operating means having a yielding connection with said actuating means.

40 8. In a machine of the class described, a horn, a rack connected with said horn, a plurality of pawls constructed to engage said rack, one of said pawls being positioned in advance of the other, actuating means for said pawls having a positive connection with one of said pawls and a yielding connection with another of said pawls, and operating means having a yielding connection with said actuating means.

50 9. In a machine of the class described having a presser-foot, a horn spindle, a horn having a bore larger than said spindle and constructed to permit said horn to tip sufficiently to clear the presser-foot and permit removal of the horn, and means constructed to hold said horn laterally rigid on said spindle.

60 10. In a machine of the class described having a presser-foot, a horn spindle, a horn having a bore larger than said spindle and

constructed to permit said horn to tip sufficiently to clear the presser-foot and permit removal of the horn, and means constructed to hold said horn rotatively in alinement with the presser-foot.

65 11. In a machine of the class described having a presser-foot, a horn spindle having a vertical bearing for a horn, a horn removably mounted on said bearing to rotate thereon, and means for rendering the bearing connection between said horn and bearing loose to permit said horn to tip laterally on said bearing sufficiently to clear the presser-foot.

70 12. In a machine of the class described having a presser-foot, a horn spindle having a vertical bearing for a horn, a horn removably mounted on said bearing to rotate thereon, and a member insertible between said horn and said bearing constructed when in position to hold the horn laterally rigid, and when out of position to permit said horn to tip on said bearing.

80 13. In a machine of the class described, a horn spindle, a horn having a bore larger than said spindle and means connecting said horn and spindle constructed and arranged when in operative position to hold said horn against tipping movement on said spindle, and when out of operative position to permit said horn to tip on said spindle.

90 14. In a machine of the class described, a horn spindle having a shoulder, a horn having a bore larger than said spindle and resting on said shoulder, and a removable member between said horn and spindle constructed and arranged when in operative position to hold said horn against tipping movement on said spindle, and when out of operative position to permit said horn to tip on said spindle.

100 15. In a machine of the class described, a horn spindle, a horn having a bore larger than said spindle, and a removable sleeve between said horn and spindle.

105 16. In a machine of the class described, a horn spindle, a horn having a bore larger than said spindle, and a removable split sleeve between said horn and spindle.

110 17. In a machine of the class described, a horn spindle, having a shoulder, a horn having a bore larger than said spindle and resting on said shoulder, and a removable sleeve between said horn and spindle.

In testimony whereof I affix my signature in presence of two witnesses.

STEPHEN A. DOBYNE.

Witnesses:

J. H. BRUNINGA,
ROY J. DIXON.