

No. 846,028.

PATENTED MAR. 5, 1907.

W. HEATON.
BOOT MACHINERY.
APPLICATION FILED SEPT. 30, 1906.

2 SHEETS—SHEET 1.

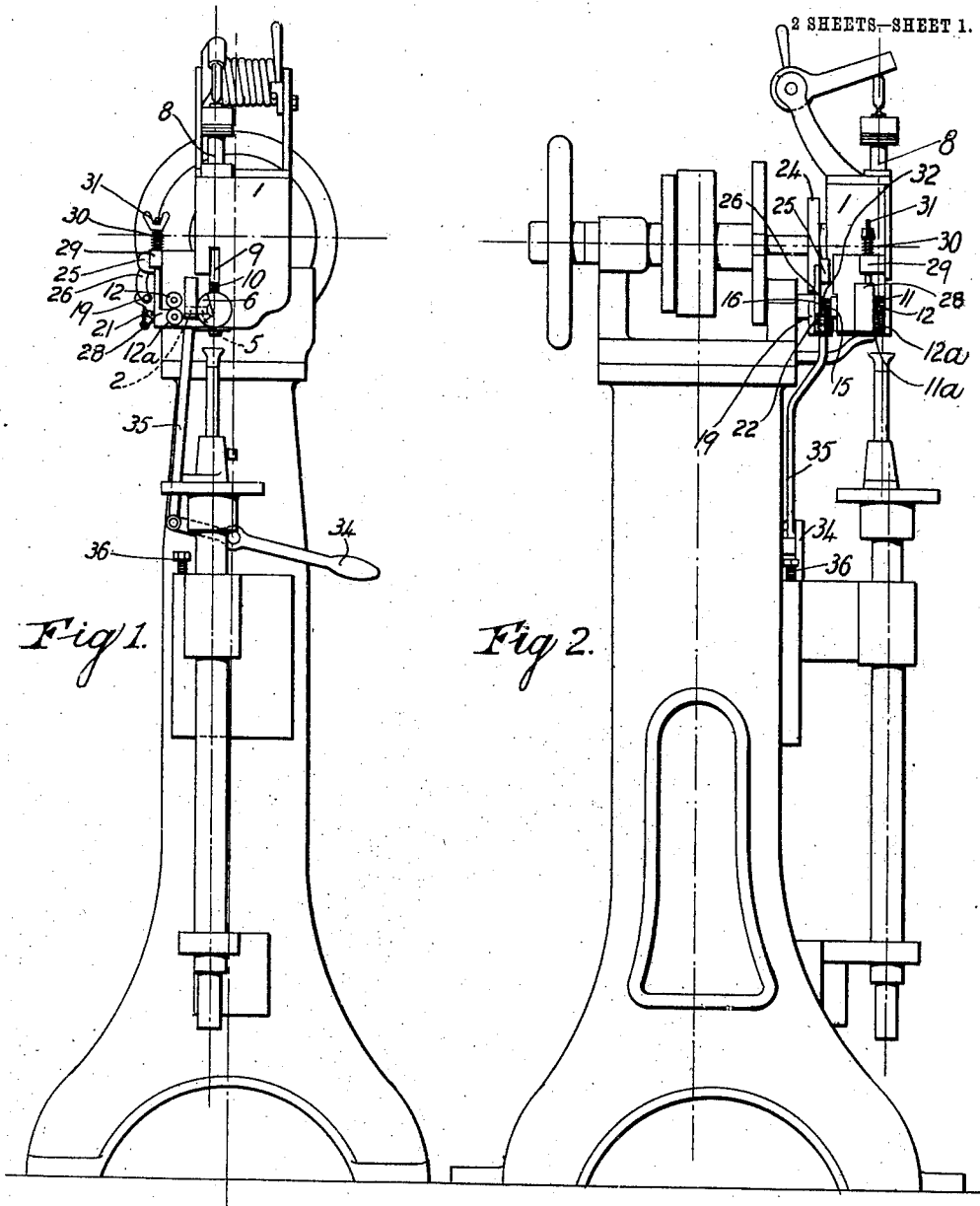
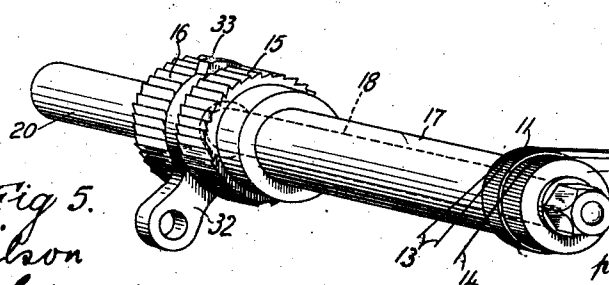


Fig. 1.

Fig. 2.



Witnesses.
Thos. Wilson
George Lester

Inventor,
William Heaton.
per. E. H. Lewis
Attorney.

W. HEATON.
BOOT MACHINERY.
APPLICATION FILED SEPT. 30, 1906.

2 SHEETS—SHEET 2.

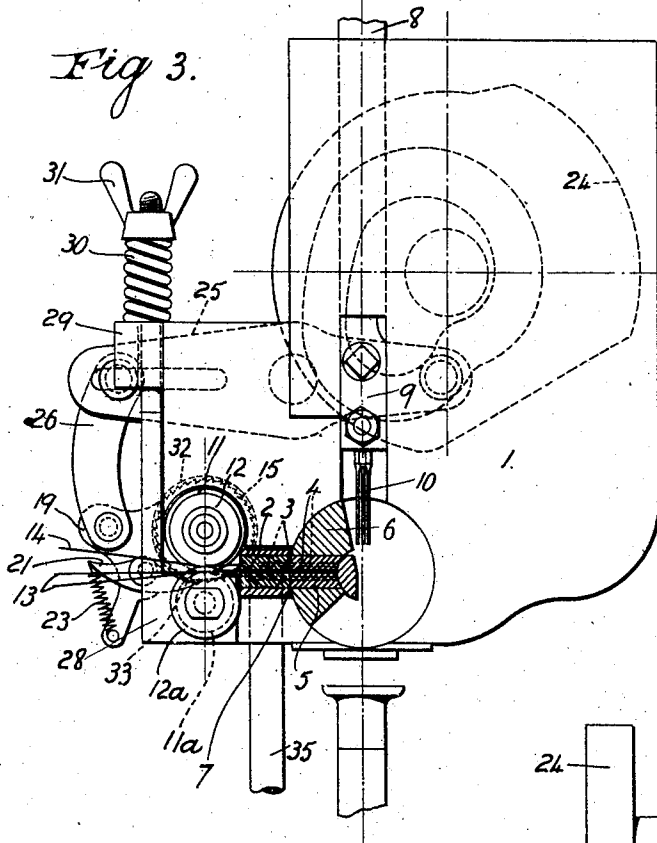


Fig. 8.

Fig. 9.

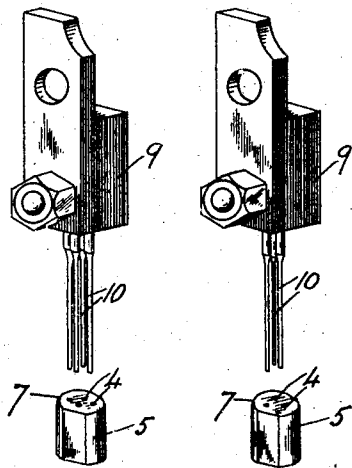


Fig. 6.

Fig. 7.

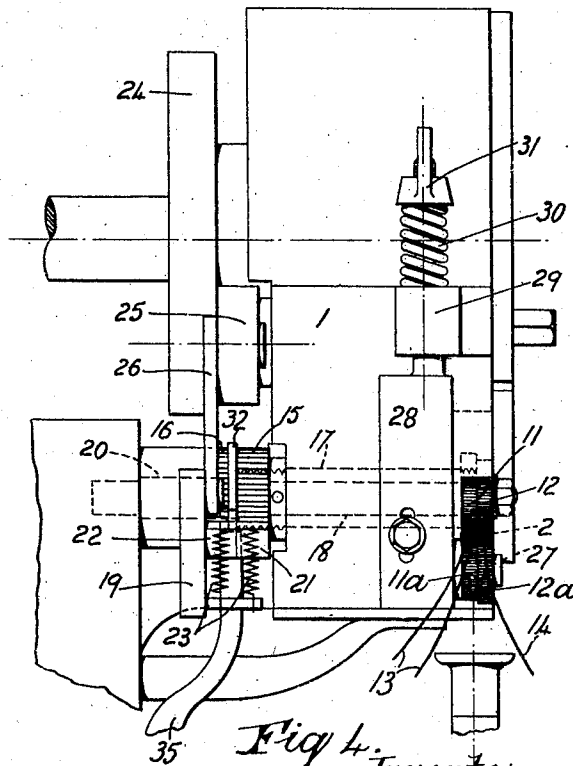


Fig. 4.

Witnesses.
Mor. Wilson
George Lester

Inventor.
William Heaton.
per. G. M. Lewis
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM HEATON, OF LEICESTER, ENGLAND.

BOOT MACHINERY.

No. 846,028.

Specification of Letters Patent.

Patented March 5, 1907.

Application filed September 30, 1905. Serial No. 280,854.

To all whom it may concern:

Be it known that I, WILLIAM HEATON, a subject of the King of Great Britain, a citizen of Leicester, England, residing at Elswin Works, Harvey Lane, Leicester, in the county of Leicester, England, have invented certain new and useful Improvements in Boot Machinery, of which the following is a specification.

10. This invention relates to nailing-machines of the character in which a short section or nail is cut off the end of a continuous length of wire and driven into the sole or heel of a boot or shoe for the purpose of either fastening it onto the latter or merely to stud it to increase the wearing-surface thereby.

Such machines are commonly known as "slugging-machines;" and the principal object of the invention is to insert in a boot sole or heel at one operation a plurality or group of slugs, hereinafter referred to as "nails," either in the same line or in parallel lines.

According to one form the nails are inserted in groups of three, two of such nails being in the same line, preferably near the outer edge of the sole or heel, hereinafter termed the "stock," and the third nail in a parallel line therewith and in a position midway between the other two nails, thus giving to the group a triangular form. It should be understood, however, that any group of nails driven into the stock at one operation may either all be in one line or different lines.

The herein-described improvements are particularly applicable to the slugging-machine described in my former United States patent, No. 755,489, March 22, 1904, and reference to the said patent will make the following description of the present improvements better understood.

For the purpose of this invention the slugging-machine is so constructed and arranged that the full complement of nails is simultaneously cut off a corresponding number of lengths of wire, after which they are simultaneously carried underneath the driver and subsequently simultaneously driven into the stock by the drivers, the number of which is equal to the number of nails to be driven into the stock.

The full complement of wire lengths may be fed through one pair of feed-rolls to a cutter which will cut off the three nails synchronously, carry them into position under the drivers, which upon forcibly descending will

drive them into the stock. The three drivers may be fixed in the same carrier-block attached to a single driver-bar, so that they are all actuated together, and the throat of the machine has also a plurality of passages therein, one for each nail, so that each nail is separately guided while it is being driven.

The feed-rolls may be arranged so that there is a separate pair of feed-rolls for each length of wire, each pair being driven by a separate pawl and ratchet-wheel, so that any one can be placed out of action when required by merely disengaging the pawl, or pawl-and-ratchet or other driving-gear of these rolls may be arranged so that a differential feed is the result—that is to say, certain of the feed-rolls may be arranged to feed a greater length of wire than the other or others. This differential feed is sometimes advisable, particularly in cases when nailing the heels of boots, as it is desirable to use longer nails on the outside row of nails than on the inner parallel row or rows of nails on the heels, the longer nails in these circumstances being employed for attaching the top piece to the body of the heel, whereas the shorter nails are intended only for studding or embedding in the top piece alone. These feed-rolls may be arranged on concentric spindles—that is, hollow spindles in the form of sleeves placed one over the other and each provided with a separate and independent feed-roll actuated by pawl-and-ratchet driving-gear having a differential movement, which results in a greater or shorter length of wire being fed into the cutter.

It will be obvious that where a number of lengths of wire require an equal feed they may be fed over the same feed-roll, and the cooperating rolls between which and the hereinbefore-described rolls the wire passes may be located on the same spindle. The pawl-and-ratchet gear may be actuated by any suitable mechanism interposed between them and a cam on the driving-shaft.

The invention will be readily understood from the following detail description, reference being made to the accompanying sheets of drawings, in which—

Figure 1 is a front elevation of a slugging-machine to which the present improvements are applied. Fig. 2 is a side elevation of the same machine. Figs. 3 and 4 are front and side elevations, respectively, of the head of the machine. Fig. 5 is a perspective view of

the feed-rolls, spindles, and ratchet-wheels. Figs. 6 and 7 are perspective views of two driver-carrying blocks and guides, while Figs. 8 and 9 illustrate the form of groupings of the said two blocks, respectively. Figs. 3 to 9 are drawn to enlarged scales, and the same reference characters are employed to designate the same parts throughout the drawings.

The type of machine to which the improvements comprising the present invention are applied will be found described and illustrated in the specification of my former United States patent, No. 755,489, of March 22, 1904, the said present improvements relating to the driver 43, bush 64, and throat 66, ratchet-wheel, clawker, and feed-roll 51, 52, and 55, respectively, of the said patent.

In order that a group of nails may be simultaneously driven into the stock, the nailing-machine is so constructed that the full complement of nails is simultaneously cut off a corresponding number of lengths of wire and carried in a guide or throat underneath the drivers, the said guide or throat and drivers being in the form of the group of nails desired.

Previous to their being cut the lengths of wire are fed (by means hereinafter described) through the steel bush or guide 2, which is suitably carried in the head 1 of the machine. (See Fig. 3.) The said guide 2 is provided with passages 3, through which the lengths of wire are fed to similar passages 4 in the steel guide or throat 5, carried in the rotary oscillating cutter-block 6. As the said cutter-block 6 is rotated it will be seen that the lengths of wire in the passages 4 will be cut off by the meeting ends 7 of the guide 2 and throat 5, the cut lengths being carried down in the said passages 4 under and into alignment with the driver-bar 8. The lower end of the said driver-bar is provided with a driver-block 9, carrying the drivers 10, which also correspond in number to the nails to be driven into the stock, and, as will be clearly seen in Figs. 6 and 7, the arrangement of the said drivers in the block 9 and the position of the passages 4 in the throat 5 are such as to give the group of nails the desired form when driven into the stock by the descending driver-bar 8. The drivers 10 and throat 5 of Fig. 6 form a group of nails, as shown in Fig. 8, and the group in Fig. 9 is formed by the drivers and throat of Fig. 7. The driver-blocks 9, throats 5, and corresponding guides 2 may be interchangeably carried in their respective parts, so that various groupings may be inserted on the same machine.

The lengths of wire are fed to the guide 2 by means of feed-rolls, and it may be arranged that a separate pair of rollers be provided for each length, or a number of lengths may be fed between the same rollers. In the machine illustrated the three lengths of wire

are fed to the guide 2 by means of two pairs of rollers 11 and 12, Figs. 3, 4, and 5, the rollers 11 feeding the two wires 13 and the other rollers 12 feeding one wire 14. The rollers 11 and 12 are operated independently by pawls working on the ratchet-wheels 15 and 16, the roller 11 and ratchet-wheel being mounted on a sleeve or hollow spindle 17 and the roller 12 and ratchet-wheel 16 being mounted on a spindle 18, carried in the sleeve 17, before mentioned. The sleeve 17 is suitably carried in the head 1 of the machine, and a rocking-lever 19, Figs. 3 and 4, carried on the extended end 20 of the spindle 18, has pivoted thereto suitable pawls 21 22, which are held in engagement with the ratchet-wheels 15 16, respectively, by springs 23. The rocking lever 19 is operated by means of a suitable cam 24, lever 25, and link 26, and as the said lever 25 and link 26 descend it will be seen that the ratchet-wheels will be racked round by the pawls 21 22, thus rotating the feed-rolls to feed forward the lengths of wire.

The edges of the feed-rolls 11 12 are milled and also the coöperating rollers 11^a 12^a, which are carried on a spindle 27 on the side of an adjustable bracket 28, and the upper end of the said bracket passes through a lug 29 on the head 1 of the machine and is provided with a spring 30 and nut 31, which can be employed to regulate the power of the spring and adjust the wire for feeding the latter forward and also for different gages of wire.

In order that a differential feed may be imparted to the length of wire 14 to shorten same, so that the nails cut off the lengths 13 will be longer, being located nearest the edge of the boot, as hereinbefore mentioned, the pawl 22 is so arranged that it may be held out of engagement with the ratchet-wheel 16 during the whole or part of its stroke, and for this means a cam-plate 32 is rotatably mounted on the spindle 18 and between the two ratchet-wheels 15 16. The said pawl 22 is sufficiently wide to overhang the cam-plate 32, (see Fig. 4,) and a projection 33 on the said plate, Fig. 5, is adapted to lift the pawl clear of the ratchet-wheel when the cam-plate is partly rotated by means of a hand-lever 34 and connecting-rod 35. As shown in Figs. 1 and 2, an adjustable stop 36 is provided on the frame of the machine in order to regulate the amount of movement of the hand-lever 34 and consequent rotation of the cam-plate 32, and it will be obvious that if the said cam-plate be rotated so that the projection 33 on same comes round under the pawl 22 and lifts the same clear of the ratchet-wheel 16 during part of its movement the rotation of the roller 12 will be less than that of the roller 11 and a consequently shorter nail will result. From the foregoing description it will be obvious that by providing different driver-blocks and cutter-guides

any desired number of nails may be driven into the stock at one time, also that the said nails may be grouped in any desired form.

What I claim, then, is—

- 5 1. In a nailing-machine for simultaneously inserting a group of nails into the stock, the combination of a plurality of drivers, a stationary guide and rotary cutter-block provided with a plurality of passages therein,
 10 pairs of feed-rollers to intermittently and independently feed a plurality of lengths of wire to the cutter-block, pawls and ratchet-wheels to independently rotate said feed-rollers, a rotatable cam-plate, and a hand-lever
 15 to partly rotate said cam-plate to vary the engagement of one of said pawls with its ratchet-wheel to vary one or more of the lengths of wire fed to the cutter-block, substantially as described.
- 20 2. A nailing-machine for inserting a plu-

rality of nails in a boot sole or heel, comprising in combination a vertically-reciprocating driver-bar, a plurality of interchangeable drivers in said bar, a rotary cutter-block, an interchangeable throat therein provided with 25 a plurality of passages, an interchangeable stationary guide having passages to correspond with said throat, pairs of feed-rollers to intermittently feed a plurality of lengths of wire to the cutter-block, pawls and ratchet- 30 wheels to rotate said feed-rollers, and a rotatable cam-plate to vary the amount of movement imparted to one pair of the feed-rollers, substantially as described.

In testimony whereof I affix my signature 35 in presence of two witnesses.

WILLIAM HEATON.

Witnesses:

E. N. LEWIS,
 GEORGE LESTER.