W. O. WHEELER.

MACHINE FOR INSERTING FASTENINGS.

APPLICATION FILED FEB. 23, 1907.

959,666.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

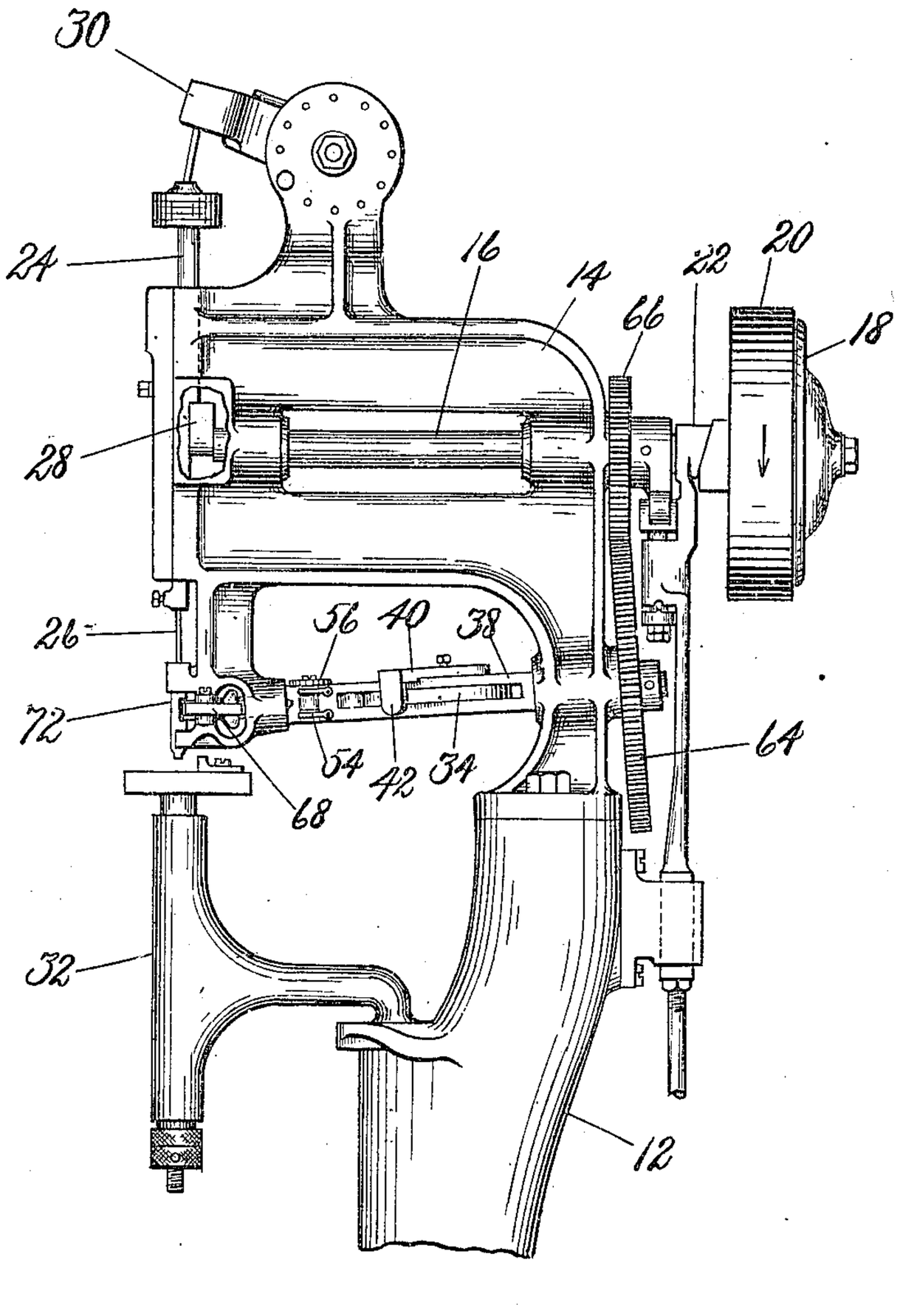

Fig. 1.

WITNESSES.

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2 SHEETS—SHEET 2.

Fig. 2

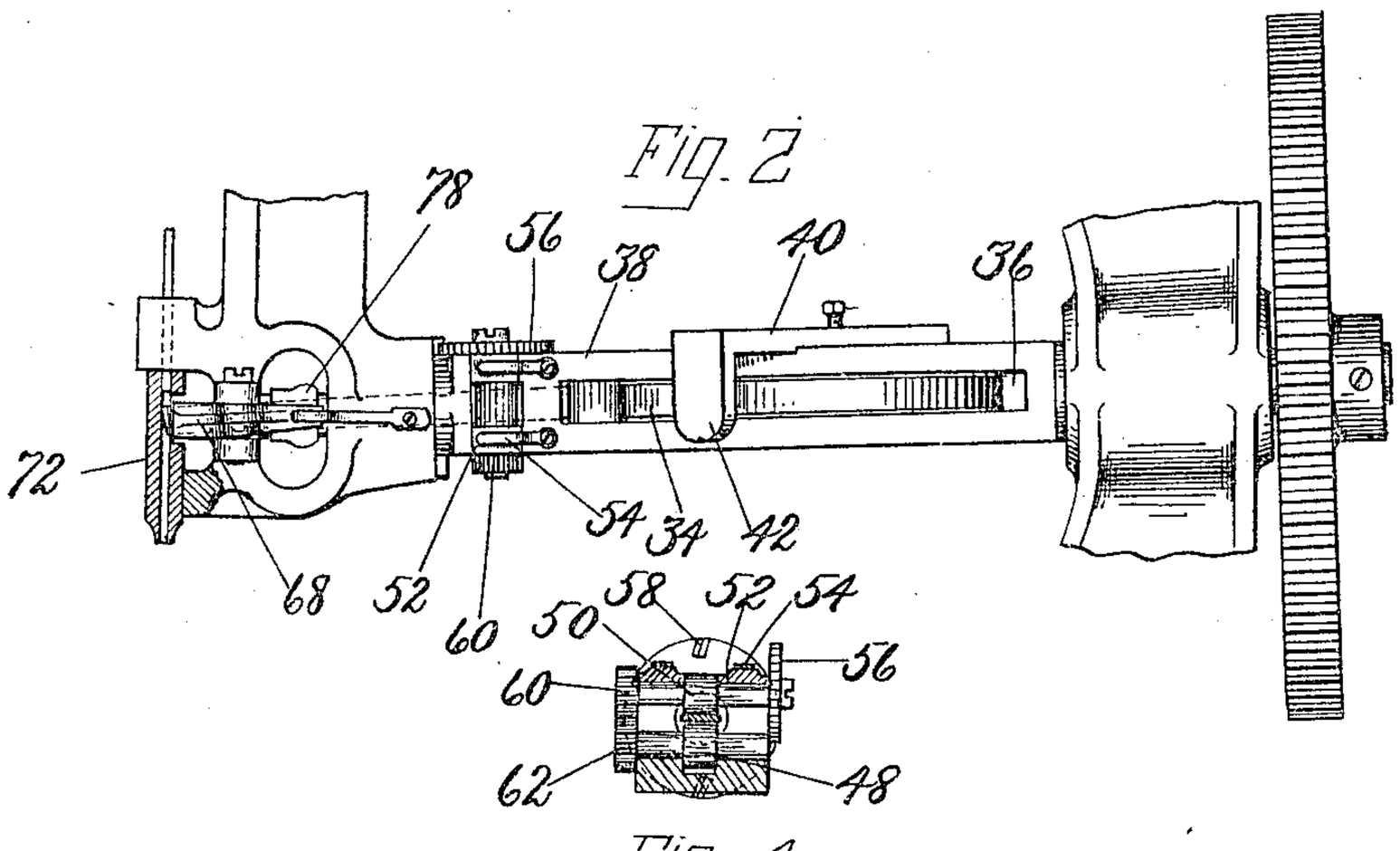

Fig. 4

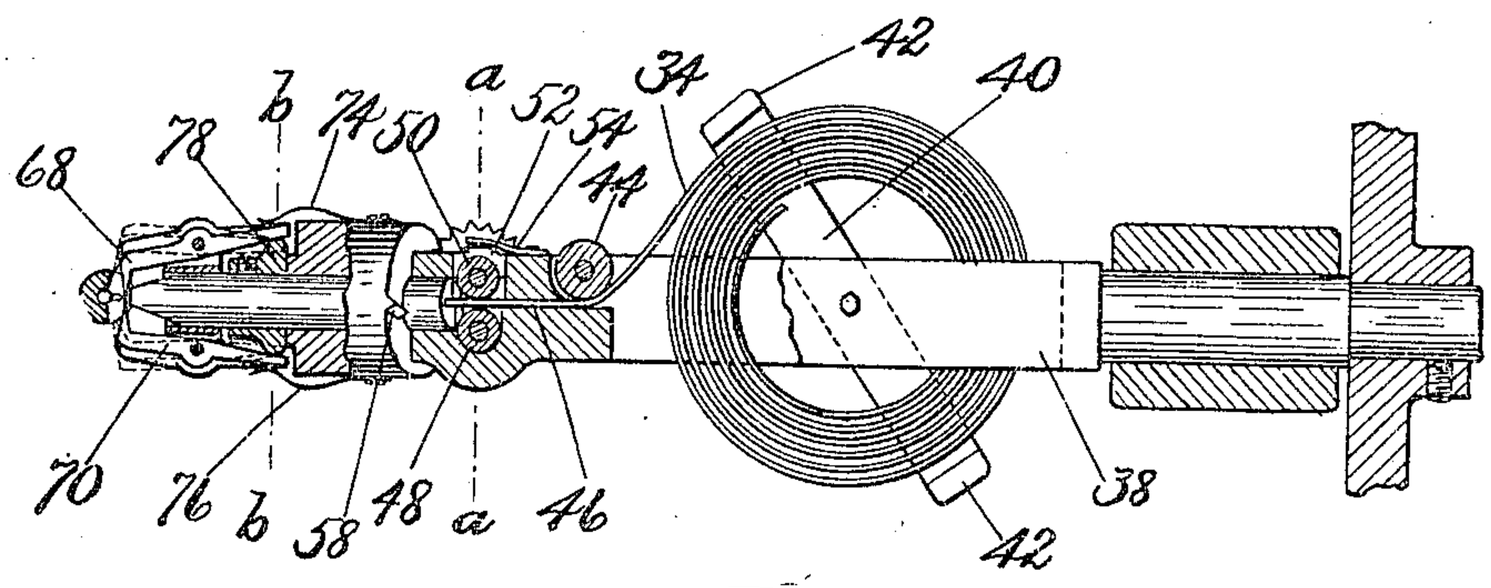

Fig. 3.

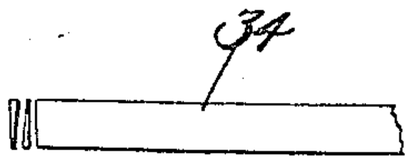

Fig. 6.

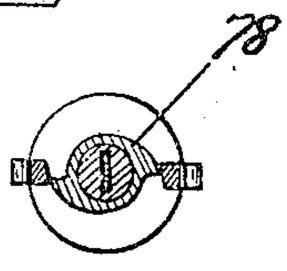

Fig. 5.

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UNITED STATES PATENT OFFICE.

WALTER O. WHEELER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR INSERTING FASTENINGS.

959,666. Specification of Letters Patent. **Patented May 31, 1910.**

Original application filed August 7, 1901, Serial No. 71,182. Divided and this application filed February 23, 1907. Serial No. 359,017.

To all whom it may concern:

Be it known that I, WALTER O. WHEELER, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented certain Improvements in Machines for Inserting Fastenings, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to fastening-inserting machines of the type in which the fastenings are formed in the machine from a metal strip or ribbon by severing the projecting end of the strip, the severed end forming a fastening, the inserting axis of which was positioned before the severing operation transversely of the length of the strip. These fastenings are usually formed with one or both sides inclined to the inserting axis, and, to provide for this where the fastenings are formed from a strip or ribbon having straight parallel sides, the strip is usually oscillated or rotated in such manner that the portion of the end of the strip from which the point of the fastening is to be formed lies next to the portion from which the head of the next fastening is to be formed. This is usually effected by rotating the strip through an arc of 180°, after each fastening is severed.

The general purpose of the present invention is to simplify the construction of machines of this type, preferably by multiplying the functions of various elements of the machine, thus permitting a reduction in the number of the elements. With the reduction in the number of elements the complexity of the construction is lessened and its compactness correspondingly increased.

A particular object of the invention is to provide a simple and effective strip feed that is actuated by the rotation of the strip carrier to feed the strip forward into the severing mechanism.

A further object of the invention is to provide a severing mechanism which is also actuated by the rotation of the strip carrier, after the strip has been fed forward by the feeding mechanism, to sever the projecting end of the strip to form a fastening.

In machines of this type, as usually constructed, the strip coil from which the fastening strip is drawn is carried by some stationary part of the machine. It is therefore requisite, in order to avoid twisting the strip, that the strip carrier be oscillated from one fastening-severing position to the other and back. To provide for this oscillating movement requires the intervention of more or less complicated mechanism between the continuously rotating driving shaft and the strip carrier. In the embodiment of the invention illustrated, the strip coil is shown as mounted upon the strip carrier to rotate therewith, so that the strip carrier may be rotated in one direction only through connection with the driving shaft.

Another object of the invention therefore is to provide an improved and compact strip and coil carrier. The strip carrier may be connected to the driving shaft, directly or indirectly, through transmitting mechanism which imparts to it a uniform speed of rotation, or, through any of the well-known speed varying mechanisms it may be so connected that its speed of rotation varies in different parts of its rotative movement.

In the drawings, which illustrate the fastening-inserting mechanism disclosed in the application of Walter O. Wheeler, Serial No. 71,182, filed August 7, 1901, of which application the present application constitutes a division, Figure 1 is a side elevation of the upper part of a fastening-inserting machine embodying the invention; Fig. 2 is a view similar to Fig. 1, but on a larger scale, of the strip carrier and of the feeding and the severing mechanisms; Fig. 3 is a bottom plan view partially in section, of the part shown in Fig. 2; Fig. 4 is a sectional view on the line *a*—*a* of Fig. 3 looking toward the left in that figure, the strip carrier being shown as rotated a quarter of a revolution from its position in Fig. 3; Fig. 5 is a sectional view on the line *b*—*b*, Fig. 3, viewed from the same direction as Fig. 4, parts being shown in the same position as in Fig. 3; Fig. 6 is a view of a portion of the fastening strip with two successively severed fastenings, the fastenings being shown in the relative position to each other and to the strip which they occupied before severing.

Like reference characters designate corresponding parts in the several views.

A standard 12 supports a head 14 on which is mounted the main driving shaft

16, carrying fast and loose pulleys 18 and 20 respectively, of any usual or preferred construction. A forked wedge member 22, connected to a treadle (not shown) is adapted, when it is depressed, to force the loose or driven pulley 20 into frictional engagement with the fixed pulley 18 and thus impart motion to the shaft 16. A driver bar 24 carrying a driver 26 is raised and released at each revolution of shaft 16 by a cam 28 of well-known construction, and is positively depressed to drive the fastening by a spring-actuated arm 30. A work support 32 pivoted upon the standard 12 is provided to support the work into which the fastenings are to be inserted. The metal strip 34, from which the fastenings are to be formed, is taken from a coil which is confined in a slot 36 in the rotatable strip carrier or shaft 38 by a member 40 which extends across the carrier 38 and has downwardly projecting lugs 42 at its opposite ends, the said lugs 42 embracing the coil between them. The strip 34, drawn from the coil, passes over a guide roller 44 and through a central opening in the carrier 38, the opening being approximately of the size and shape of the strip. Feed rolls 48 and 50 engage the strip on opposite sides in the passage 46, the feed roll 48 being fixedly mounted in carrier 38 and feed roll 50 being carried by a block or frame 52, spring-pressed toward roll 48 by springs 54, whereby the rolls engage the strip with a yielding pressure. The roll 50 is actuated through a toothed wheel 56, connected to rotate with it. Located upon the frame are two teeth or lugs 58, which are so positioned that each engages the toothed wheel and rotates it one step at each rotation of the carrier or shaft 38. As the teeth 58 are 180° apart, the toothed wheel is rotated one step at each half rotation of the carrier 38. Through gears 60, 62, the roll 48 is rotated with roll 50 so that the strip 34 is advanced at each half rotation of carrier 38. Carrier 38 is rotated through gear wheel 64 which meshes with the gear wheel 66 on the shaft 16. The gear wheels 64, 66 may be either circular to give a uniform speed of rotation to carrier 38, or elliptical to vary the speed at the time the fastening is severed. The fastening-severing mechanism comprises cutter levers 68, 70 pivoted upon the machine frame upon opposite sides of the forward end of the strip carrier or shaft 38. The cutting ends of said levers are adapted to enter a cut-away portion in the side of the driver tube 72 and the strip 34 is fed forward so that its end projects over the driver passage in said tube, whereby the fastening, as it is severed, is caused to fall into the driver passage into position to be driven. To aid in guiding the fastening into the driver passage, the forward ends of the cutter levers are beveled so that when closed together their forward edges form portions of the side walls of the driver passage.

The cutting ends of levers 68, 70 are kept normally separated by springs 74, 76, pressing upon their other arms. Twice during each rotation of the carrier or shaft 38 the cutter levers are actuated to sever a fastening through the action of a cam 78 on carrier 38 having two cam projections which simultaneously engage the rear arms of levers 68 and 70 respectively and force them apart against the action of springs 74, 76, thus forcing together the cutting ends. The cam projections on cam 78 have abrupt drop-off portions, so that as soon as the fastening has been severed from the strip the rear arms of levers 68 and 70 are released and the cutters are at once separated by the action of springs 74, 76. In order that the sides of the fastenings may be tapered, the carrier or shaft 38 is inclined to the cutting edges of cutter levers 68 and 70. As the carrier 38 is rotated through an angle of 180° after each fastening is severed before the next fastening is severed and the inclination of carrier 38 to cutter levers 68, 70 remains the same, it will be seen, as shown in Fig. 6, that the broad portion or head of one fastening is situated in the strip, before severing, adjacent the narrow portion or point of the next fastening.

The operation of the machine is as follows: The loose pulley 20 being brought into engagement with the fixed pulley 18 upon shaft 16 through the action of the wedge member 22, the shaft 16 is actuated, and through gears 66, 64, rotates the strip carrier 38. At each half rotation of the strip carrier 38, the toothed wheel 56 engages one of the stationary teeth 58 and is moved thereby one step, thus actuating the rolls 50, 48 to feed forward the strip 34 between the cutters 68 and 70 a distance sufficient to form a single fastening. Upon further rotation of the strip carrier 38, approximately one-quarter of the complete rotation, the cam projections upon the cam 78 engage the rear ends of the cutter levers 68, 70 simultaneously and force the cutting ends together to sever the fastening. The fastening drops into the driver tube 72 and immediately thereafter the driver descends to drive it into the work. It will be noted that two fastenings are severed and driven for each rotation of the carrier 38 and that the lines of severing of the two fastenings are inclined in different directions from the same edge of the strip.

The various parts are preferably so timed that the strip is fed forward while the cutters are in their extreme separated positions, and after the driver has returned to its upper position from driving the previously formed fastening. This will require ap-

proximately a quarter rotation of shaft 38 to intervene between the actuation of the cutters and the actuation of the feeding device. The cutters do not then interfere with the feeding of the strip and the strip does not interfere with the action of the driver.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. The combination with a shaft constructed to carry a ribbon of fastening material and means for imparting to said shaft an angular movement, of means for intermittingly feeding forward a section of said ribbon, means for severing said ribbon after it has been fed forward, and connections between both of said means and said shaft whereby they are controlled by the movement of said shaft.

2. In a machine for inserting fastenings, the combination with the frame of the machine, of a rotatable shaft mounted in said frame and constructed to carry a ribbon of fastening material, fastening-severing mechanism carried by the frame, ribbon feeding mechanism carried by the shaft, means carried by the shaft for actuating the severing mechanism, and means carried by the frame for actuating the feeding mechanism.

3. The combination with a shaft constructed to carry a ribbon of fastening material and means for imparting to said shaft an angular movement, of means for intermittingly feeding forward a section of said ribbon, cutters for severing said ribbon after it has been fed forward, and means carried by said shaft for actuating said cutters.

4. The combination with a shaft carrying a ribbon of fastening material, and means for imparting to said shaft an angular movement, of feed rolls carried by the shaft for engaging said ribbon, operating means for said rolls comprising a rotatable member attached to one of the rolls and having a plurality of engaging projections and a stationary member adapted to engage these projections successively upon successive rotations of the shaft.

5. In a machine of the class described the combination with a frame a shaft mounted therein constructed to carry a ribbon of fastening material and means for rotating said shaft, of cutters mounted upon the frame, between which cutters the fastening material is fed, and means upon the shaft for actuating the cutters to sever the portion of fastening material fed between them.

6. In a fastening inserting machine, in combination, a rotatable shaft, constructed to support a metallic ribbon, feed devices carried by said shaft, stops arranged to be engaged by said feed devices whereby the feed devices, in passing, are caused to move for feeding the metallic ribbon step-by-step, at each half rotation of said shaft, cutter devices, and a cam on said shaft to operate the cutter devices for cutting a section from the metallic ribbon, said section constituting the fastening.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER O. WHEELER.

Witnesses:

H. DORSEY SPENCER,

ARTHUR L. RUSSELL.

Corrections in Letters Patent No. 959,666.

It is hereby certified that in Letters Patent No. 959,666, granted May 31, 1910, upon the application of Walter O. Wheeler, for an improvement in "Machines for Inserting Fastenings," errors appear in the printed specification requiring correction as follows: Page 3, line 38, the word "carrying" should be stricken out and the words *constructed to carry* inserted instead; same page, line 42, the word "operating" should be stricken out, and same line after the word "for" the words *intermittently turning* should be inserted; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of July, A. D., 1910.

[SEAL.]

F. A. TENNANT,

Acting Commissioner of Patents.