

I. C. BUCKMINSTER.  
MACHINE FOR INSERTING FASTENINGS.  
APPLICATION FILED NOV. 14, 1910.

1,000,490.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.

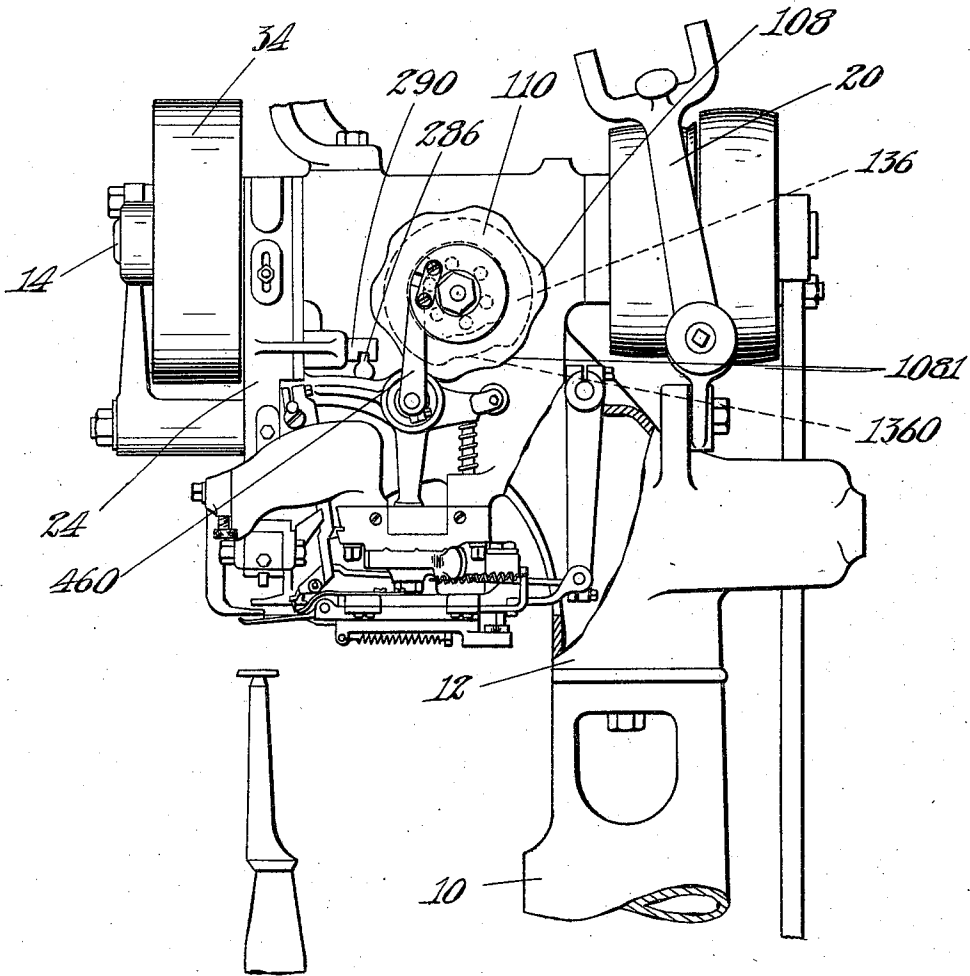


Fig. 1.

WITNESSES:

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By his Attorney,  
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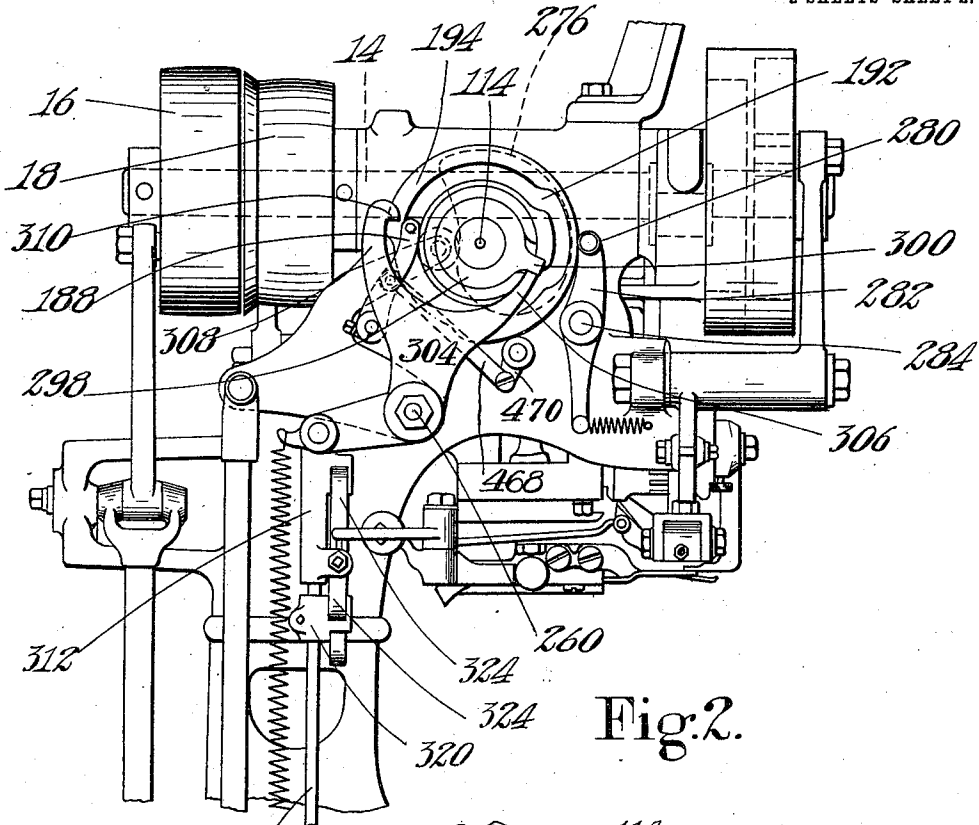


Fig. 2.

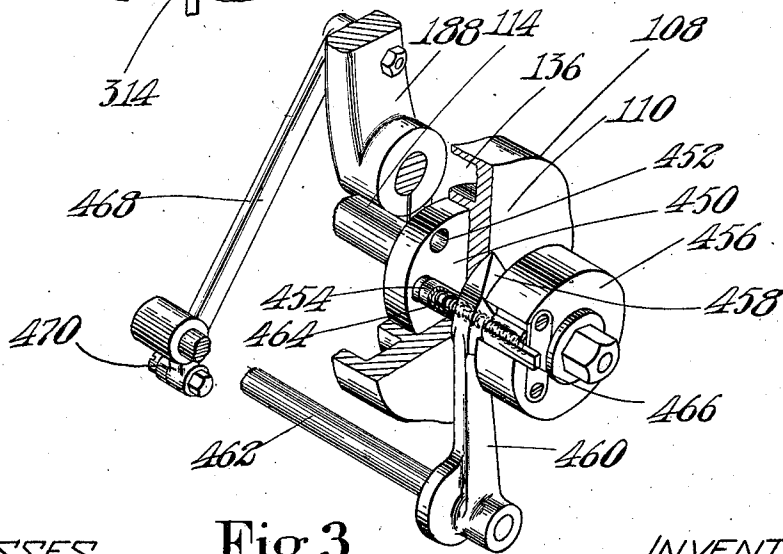


Fig. 3.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

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MACHINE FOR INSERTING FASTENINGS.

1,000,490.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed November 14, 1910. Serial No. 592,223.

*To all whom it may concern:*

Be it known that I, IRA C. BUCKMINSTER, a citizen of the United States, residing at Beverly, in the county of Essex and State 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 machines for inserting fastenings and is herein shown as embodied in a fastening inserting machine of the type disclosed in the co-pending application of Louis A. Casgrain for Letters Patent for improvements in machines for inserting fastenings, Serial No. 452,755, filed September 12, 1908.

The machine of the co-pending application comprises, among other things, fastening inserting mechanism which is driven from a continuously operated driving shaft, means for controlling the lengths of the fastenings presented to the inserting mechanism, means for selecting from a plurality of sources of fastening supply the fastenings to be presented to the inserting mechanism, and means, under the control of the operator, for rendering the inserting mechanism inoperative to insert fastenings and for causing the insertion of fastenings to be resumed without stopping said mechanism. Since the machine is designed to run at comparatively high speed, the last mentioned means has been so timed that both in rendering the mechanism operative to insert fastenings and in rendering it inoperative for this purpose a number of rotations of the driving shaft will take place after the said means has been actuated and before it completes its operation. This timing of the said means allows to the operator sufficient time to control these two operations when it is desired to insert a single fastening only. To provide such timing in the machine of the co-pending application, a second shaft is so geared to the main driving shaft that it is driven at a reduced speed. Upon this second shaft is mounted both the means for rendering the inserting mechanism operative and inoperative, and the means hereinabove referred to for controlling the lengths of the fastenings to be presented to the inserting mechanism and for controlling the selection

of the said fastenings from a plurality of sources of fastening supply.

The machine of the co-pending application is especially adapted for use in inserting fastenings in the heels or soles of boots or shoes, and particularly for use in the operation commonly known as "slugging." The fastenings commonly known as "slugs" are usually inserted in the top lifts of the heels of boots or shoes, and their principal function is to ornament the heels and to increase their wear-resisting properties. For these purposes it is not important that the slugs be driven very far into the heel, and to economize material the most of the slugs inserted in the top lift are of a length sufficient only to permit their extending a short distance through the top lift. It is desirable, however, in order that a top lift may be more firmly secured to the heel, that some of the slugs be longer than the others, and provision has been made in the machine of the co-pending application for inserting occasionally a long slug in the slugging operation. To secure the greatest advantage from these long slugs, it is desirable that at least one of them be located near the breast corner of the top lift. It is therefore desirable that the first slug inserted be a long slug, since the insertion of slugs begins usually near the breast corner. Provision has been made in the machine of the co-pending application for presenting the slugs or other fastenings to the inserting mechanism in such succession as to lengths that the first slug or fastening inserted will be a long one, and to insure such succession as to lengths, in the presentation of the fastenings or slugs, the means for controlling the starting and stopping of the insertion of fastenings in the machine of the co-pending application is so controlled by the fastening length controlling means, which is continuously operated, that the insertion of fastenings will not be started until the fastening length controlling means is in such position that it will present a long fastening to the inserting mechanism for the first fastening inserting operation. This construction has proved successful in operation, but is open to the objection that when the second shaft, upon which the fastening length controlling means is mounted, is so geared to the main shaft, which operates the fastening inserting mechanism, that the second shaft

is driven at a speed much slower than the main shaft, as, for example, in the machine of the co-pending application, in which the ratio of speeds is 6 to 1, a number of rotations of the main shaft may take place after the operator has depressed the treadle to render the inserting mechanism operative before such depression of the treadle will have any effect upon the means for rendering said inserting mechanism operative.

A particular object of the present invention, therefore, is to improve the construction of the machine of the co-pending application in this respect, and to provide means for so correlating the starting and stopping of the insertion of fastenings with the operations of the fastening length controlling means that no ineffective operations of the driving shaft will intervene between the manipulation of the treadle, or other manually controlled means for rendering the machine operative, and the actuation of the means which controls the starting and stopping of the insertion of fastenings. In order that the slugs or other fastenings which are used to secure the top lift more firmly upon the heel may form as efficient holding means as possible, it is desirable, where convenient, that these slugs or fastenings be roughened or corrugated on their sides. Preferably, therefore, the machine of the co-pending application is so constructed and timed that the long fastenings shall be taken from a predetermined source of fastening supply which can be provided, if desired, with corrugated or other suitably roughened fastening material.

Another object of the invention, therefore, is not only to so correlate the fastening length controlling means and the fastening selecting means that the long fastening shall be taken from a predetermined source of fastening supply, but to so correlate the operations of both of said means with the starting and stopping of the insertion of fastenings that the first fastening inserted shall be a long fastening from a predetermined source of fastening supply, and that no ineffective operations of the driving shaft shall intervene between the manipulation of the treadle, or other manually controlled means for rendering the machine operative, and the actuation of the means which controls the starting and stopping of the insertion of fastenings.

In the foregoing statements, emphasis has been placed on the purposes and advantages of this invention as employed with the machine of the co-pending application, but it will be understood that many of the features of the invention can be embodied to advantage in other machines of the same general type, or in other types of machines, and that the invention as a whole is susceptible of quite general application.

Other features and objects of the invention will be apparent from the following description and claims, when considered in connection with the accompanying drawings, in which,—

Figure 1 is a left-hand side elevation of the upper part of the machine of the co-pending application showing the present invention embodied therein; Fig. 2 is an elevation of the machine viewed from the opposite side; and Fig. 3 is a perspective detail partly in section of the means for connecting the fastening length and design cam to the constantly rotating shaft, or disconnecting it therefrom.

Referring to the drawings, a base or standard 10 supports a head 12 in which is carried the main driving shaft 14. Upon the shaft 14 are mounted fast and loose pulleys 16 and 18, a belt shifter 20 serving to shift the belt from the loose pulley 18 to the fast pulley 16 when it is desired to connect the machine to the source of power. As hereinabove suggested, such connection is preferably constantly maintained when the machine is in use.

The fastening inserting mechanism is mounted in a swinging frame 24 at the forward end of the head 12, this swinging frame being carried by a sleeve surrounding the shaft 14 and having its bearings in the head 12, as fully described and illustrated in the co-pending application above referred to. The frame 24 receives its swinging motion from a cam in a cam disk 34 attached to the front end of the main shaft 14. The fastening inserting mechanism receives its movement from the cam disk 34 and from an eccentric upon the main shaft 14 within the swinging frame 24, as more fully shown and described in the co-pending application, and is preferably constantly operated together with the main shaft 14.

When it is desired to interrupt the insertion of fastenings and to lower the work support into work receiving position, a cam disk 194 is clutched to a cross-shaft 114 geared to the main shaft 14 to be driven constantly therefrom, the ratio of speeds of the two shafts in the machine herein illustrated being 1 to 6, that is, the cross-shaft 114 rotates once for each six rotations of the main shaft 14. The cam disk 194 has a cam groove 192 which controls the movement of the awl into and out of operative relation to the fastening inserting mechanism through suitable connections comprising a lever arm 188, a cam 276 which controls the movement of the work support between work receiving and operative work supporting positions, an edge cam which engages a cam roll 280 upon an arm 282 connected to the rock-shaft 284 which, through a second arm or finger 286 and a sliding bolt 290, controls the locking of the fastening strip re-

tainer to the reciprocating cutter carrier head and the unlocking of said retainer from said head, and thereby controls the stopping and the starting of the fastening inserting operation,—all as more fully described in the co-pending application above referred to.

The clutching of the cam disk 194 to the cross-shaft 114 is controlled by connections with a treadle or other manually controlled means comprising a lever 304 pivoted at 260 upon the machine head, one arm of said lever being forked and the other arm being connected by a socketed member 312, toggle links 324 and 324 and a bar 320 to a rod 314 having suitable connection at its lower end to said treadle in the machine base.

When the machine is at rest, as shown in the drawings, the fork member 306 of the lever 304 engages an arm 300 upon one member of the clutch through which the cam disk 194 is clutched to the shaft 114, and holds said clutch out of operation. When the treadle is depressed to start the machine, the forked arm of the lever 304 is swung in a clockwise direction, in Fig. 2, and the fork member 306 is moved out of unclutching relation to the arm 300, whereupon the cam disk 194 is clutched to the shaft 114 and the disk 194 and the arm 300 begin to turn with said shaft. The cams upon the disk 194 are so shaped that the various elements of the machine controlled by said cams are brought into operative relation to each other when the cams have turned through an angle of substantially 180°. When, therefore, it is desired to insert several fastenings in succession, the disk 194 is unclutched from the shaft 114 after it has turned through an angle sufficient to place the various elements in operative relation to each other, such unclutching being effected, in the illustrated construction, by the engagement of a hook 310 upon the fork member 308 with the arm 300 of the clutch member 298, this hook being swung into the path of movement of the arm 300 as the fork member 306 is swung out of operative relation to said arm.

In the machine of the co-pending application, means has been provided to prevent the clutching of the disk 194 to the shaft 114 when the fork member 306 is moved out of clutch tripping relation to the arm 300, if the fastening length controlling cam disk 110 be not in such position that the number of rotations of the main shaft required to render the inserting mechanism operative to insert fastenings will turn said cam to such position that the length of the first fastening will be controlled by that one of the cam members or enlargements 108 which causes the inserting mechanism to insert a long fastening.

It will be seen from the foregoing de-

scription that the number of rotations of the main shaft 14 essential to bring the parts into operative relation to each other for the fastening inserting operation is substantially three, and that, therefore, if the cam disk 110 is provided with only one cam member or enlargement 108 which will furnish a long fastening and this member or enlargement has just passed the position in which it permits the clutching of the cam disk 194 to the shaft 114, a large number of ineffective operations of the main shaft 14 might intervene between the manipulation of the treadle, or other manually controlled means for moving the lever 304, and the clutching of the disk 194 to the shaft 114 to render the machine operative to insert fastenings. To avoid this disadvantage in the construction of the co-pending application, the present invention contemplates the provision of means for so correlating the movements of the cam disk 110 to the cam disk 194 that, whenever the lever 304 is moved to permit the cam disk 194 to be clutched to the shaft 114, the cam disk 110 will be in such position that such clutching will be effected at once, the position of the cam disk 110 being such that the first fastening inserted will be a long fastening.

As in the machine of the co-pending application, the cam groove 136 which controls the operation of the fastening presenter and determines the selection of the fastenings from the different sources of supply is preferably formed in the same cam disk 110 which carries the fastening length controlling cams or enlargements 108. It will therefore be seen that the fastenings of selected lengths will always be taken from the same selected sources of fastening supply so long as the fastening length cams 108 bear the same fixed relation to the cam groove 136.

As hereinabove suggested, it is desirable that the long fastening be taken from a source of supply other than the source, or sources, from which the short fastenings are taken, and that this source of supply be provided with roughened or corrugated fastening material. In the illustrated construction the cam groove 136 is shown to be of such a shape that all of the short fastenings will be taken from one source of supply while the long fastening, controlled by the cam or enlargement 1081, will be taken from another source of supply, the cam groove 136 changing its direction at 1360 to move the fastening presenter into a different relation to the cutters, which grip and insert the end of the fastening strip, just before the cam or enlargement 1081 comes into controlling position.

In the embodiment of the invention herein illustrated, the correlation of the movements of the cam disk 110 with the movements of

the cam disk 194 is effected by providing means for unclutching the cam disk 110 from the shaft 114 when the machine is rendered inoperative to insert fastenings, and when the cam disk 110 has come into a predetermined relation to the normal position of rest of the cam disk 194. The illustrated clutch for the cam disk 110 comprises a disk 450 rigidly attached to the shaft 114 and normally turning therewith, said disk being provided with a number of openings 452 which is equal to the ratio of speeds between the shaft 14 and the shaft 114.

The disk 450 constitutes one member of the clutch, the other member of the clutch being constituted by the pin 454 guided in an opening in the cam disk 110 and also in the disk 456 connected to the disk 110 but spaced therefrom a distance sufficient to permit the entrance of a clutch controlling wedge 458 upon an arm 460 attached to a rock-shaft 462 extending through the machine head. The pin 454 is normally pressed toward the disk 450 by the spring 464 socketed in said pin and bearing against the end of a guide for said pin in the disk 456.

A shouldered extension 466 on the pin 454 is engaged by the wedge 458 to unclutch the disk 110 from the disk 450. The operation of the wedge 458 is controlled by connections between theawl controlling lever arm 188 and the rock-shaft 462 comprising a link 468 connected at one end to the lever arm 188 and at its other end to an arm 470 upon the rock-shaft 462. The pin receiving openings 452 in the disk 450 are so located about the axis of rotation of the shaft 114 and are so related to the clutching points by which the cam disk 194 is clutched to the shaft 114, that when the pin 454 enters one of these holes to clutch the disk 110 to the shaft 114 the disk 110 and the disk 194 will be in predetermined relation to each other, and the fastening presenter cam 136 and fastening length controlling cams 108 upon the disk 110 will be brought into a predetermined controlling position for the first fastening inserting operation. This controlling position will be the same every time the machine is started.

When the lever arm 188 is moved in a clockwise direction, in Fig. 2, as the disk 194, which has been clutched to the shaft 114 to stop the insertion of fastenings begins to turn with said shaft, the arm 460 upon the rock-shaft 462 will be turned in a direction to bring the wedge 458 into clutch releasing relation to the pin 454 and the cam disk 110 will be unclutched from the shaft 114 when said disk is turned to bring the shouldered extension 466 into engagement with the wedge member 458. The number of rotations of the main shaft 14 which precede the unclutching of the cam

disk 110 from the shaft 114 after the cam disk 194 has been clutched to the shaft 114 to stop the insertion of fastenings may be more than that required to bring the cam disk 194 into its normal position of rest, since the cam disk 194 is clutched to the shaft 114 substantially as soon as the lever 304 is moved to release the arm 300, and only three rotations of the main shaft are required to bring the cam disk 194 into its second position of rest, while the cam disk 110 makes one rotation for six rotations of the main shaft 14, and has only one unclutching position, which is a position in which it bears a predetermined relation to the normal position of rest of the cam disk 194. It will be obvious, however, that no disadvantage arises from the lack of simultaneous operation of the two clutches since no effective operation is performed by the cams upon the cam disk 110 after the inserting mechanism has been rendered inoperative to insert fastenings.

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

1. In a machine for inserting fastenings, the combination with fastening-inserting mechanism and means for controlling the lengths of the fastenings presented to said inserting mechanism constructed to cause fastenings of varying predetermined lengths to be presented to the inserting mechanism in predetermined succession as to lengths, of means for rendering said mechanism inoperative to insert fastenings without stopping said mechanism constructed to stop said controlling means in predetermined controlling relation to said mechanism.

2. In a machine for inserting fastenings, the combination with fastening inserting mechanism a plurality of sources of fastening supply, and means for automatically controlling the selection of fastenings from said sources of supply constructed to cause fastenings from different sources of supply to be inserted in succession, of means for rendering said mechanism inoperative to insert fastenings without stopping said mechanism constructed to stop said controlling means in predetermined fastening selecting relation to said sources of supply and to said inserting mechanism.

3. In a machine for inserting fastenings, the combination with fastening inserting mechanism and means comprising a rotatable cam for presenting to said mechanism fastenings of varying predetermined lengths in predetermined succession as to lengths, of means for rendering said mechanism inoperative to insert fastenings, without stopping said mechanism, constructed to stop said cam at a predetermined point in its rotation.

4. In a machine for inserting fastenings, the combination with fastening inserting

mechanism, and means, comprising a cam arranged to rotate once for several operations of said inserting mechanism, for presenting to said mechanism fastenings of varying  
 5 predetermined lengths in predetermined succession as to lengths, of means for rendering said mechanism inoperative to insert fastenings, without stopping said mechanism, constructed to stop said cam at a pre-  
 10 determined angle of its rotation.

5. In a machine for inserting fastenings, the combination with fastening inserting mechanism and a continuously operating driving shaft from which said inserting  
 15 mechanism is driven, of means for starting and stopping the insertion of fastenings arranged to be connected to said driving shaft at the will of the operator when it is desired to render the inserting mechanism ope-  
 20 rative or inoperative for this purpose and to be automatically disconnected from said shaft when said mechanism has been rendered operative or inoperative, means for controlling the lengths of the fastenings presented to the inserting mechanism also  
 25 connected to said shaft and operated therefrom, and means for disconnecting said means from said shaft when the insertion of fastenings has been stopped and when said  
 30 means has come into a predetermined relation to said inserting mechanism.

6. In a machine for inserting fastenings, the combination with fastening inserting mechanism and a continuously operating driving shaft from which said inserting  
 35 mechanism is driven, of means for starting and stopping the insertion of fastenings arranged to be connected to said driving shaft at the will of the operator when it is desired to render the inserting mechanism operative  
 40 or inoperative for this purpose and to be automatically disconnected from said shaft when said mechanism has been rendered operative or inoperative, means for controlling the lengths of the fastenings presented to the inserting mechanism also connected to  
 45 said shaft and operated therefrom, and means associated with said starting and stopping means for disconnecting said fastening length controlling means from said shaft when the insertion of fastenings has been stopped and when said controlling  
 50 means has come into a predetermined relation to said starting and stopping means.

7. In a machine for inserting fastenings, the combination with fastening inserting mechanism and a continuously operating driving shaft from which said inserting  
 55 mechanism is driven, of means for starting and stopping the insertion of fastenings while said inserting mechanism continues in operation arranged to be connected to said driving shaft at the will of the operator when it is desired to render the inserting  
 60 mechanism operative or inoperative to insert

fastenings and to be automatically disconnected from said shaft when said mechanism has been rendered operative or inoperative, a plurality of sources of fastening supply,  
 70 means for automatically controlling the selection of fastenings from said plurality of sources of supply connected to said driving shaft and operated therefrom, and means for disconnecting said controlling means from  
 75 said shaft when the insertion of fastenings has been stopped and when said means has come into a predetermined relation to said inserting mechanism.

8. In a machine for inserting fastenings, fastening inserting mechanism, a plurality  
 80 of sources of fastening supply, a continuously operating driving shaft from which said inserting mechanism is driven, means connected to said shaft for controlling the selection of the fastenings from the different  
 85 sources of supply, means connected to said shaft for controlling the lengths of the fastenings inserted, and means for interrupting the insertion of fastenings constructed to disconnect said controlling means from  
 90 said shaft when in predetermined relation to each other whereby the first fastening to be inserted when the insertion of fastenings is resumed will be of a predetermined length and will be taken from a predetermined  
 95 source of supply.

9. In a machine of the class described, fastening inserting mechanism, a plurality of sources of fastening supply, a continuously operating driving shaft with which said  
 100 mechanism is connected, means connected to said shaft for controlling the lengths of the fastenings inserted, means connected to said shaft for controlling the selection of the fastenings from the different sources of supply,  
 105 and means for interrupting the insertion of fastenings without stopping the inserting mechanism constructed to disconnect said controlling means from said shaft when in predetermined relation to said inserting mechanism and to each other, said means being also constructed to restore said connections only when said parts are again in the same relation to each other.

10. In a machine for inserting fastenings, the combination with fastening inserting mechanism and a continuously operating driving shaft from which said mechanism is driven, of fastening length controlling means also driven from said shaft, means  
 115 for stopping the insertion of fastenings without stopping the inserting mechanism, and means for disconnecting said controlling means from said shaft when the insertion of fastenings is stopped constructed to permit  
 120 said controlling means to be again connected to said shaft only when said means and inserting mechanism are in a predetermined relation to each other.

11. In a machine of the class described, 130

the combination with fastening inserting mechanism and a continuously operating driving shaft from which said mechanism is driven, of fastening length controlling means also driven from said shaft, means for stopping the insertion of fastenings without stopping said mechanism, and means for disconnecting said controlling means from said shaft constructed to stop said controlling means in a predetermined position and to permit the connection with said shaft to be restored only when said inserting mechanism and said controlling means are in a predetermined relation to each other.

12. In a machine for inserting fastenings, the combination with mechanism for successively inserting fastenings and a continuously operating driving shaft from which said mechanism is driven, of means for controlling the lengths of the fastenings presented to the inserting mechanism constructed to cause fastenings of different lengths to be presented to the inserting mechanism in such succession that the row of successively inserted fastenings will comprise a series of fastenings made up of like groups, each group having the fastenings of different lengths arranged in predetermined order as to lengths, means for stopping the insertion of fastenings without stopping the inserting mechanism, and means for disconnecting said controlling means from said shaft when the insertion of fastenings is stopped

constructed to stop said controlling means in such position that the first fastening inserted when the insertion of fastenings is resumed and the connection is restored will be a selected member of one of the aforementioned like groups.

13. In a machine of the class described, the combination with fastening inserting mechanism and a continuously operating driving shaft from which said mechanism is driven, of a plurality of sources of fastening supply, means also driven from said shaft for selecting from said sources of supply the kind, or kinds, of fastenings to be presented to the inserting mechanism, means for stopping the insertion of fastenings without stopping the inserting mechanism, and means for disconnecting said selecting means from said shaft when the insertion of fastenings is stopped constructed to stop said selecting means in such position that the first fastening inserted when the insertion of fastenings is resumed and the connection is restored will be taken from a predetermined source of supply.

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

IRA C. BUCKMINSTER.

Witnesses:

H. DORSEY SPENCER,  
EMILE H. TARDIVAL.