Nov. 28, 1933. W. H. JOHNSON 1,936,940

NAIL STRIP FEEDER

Filed Aug. 24, 1931 2 Sheets-Sheet 1

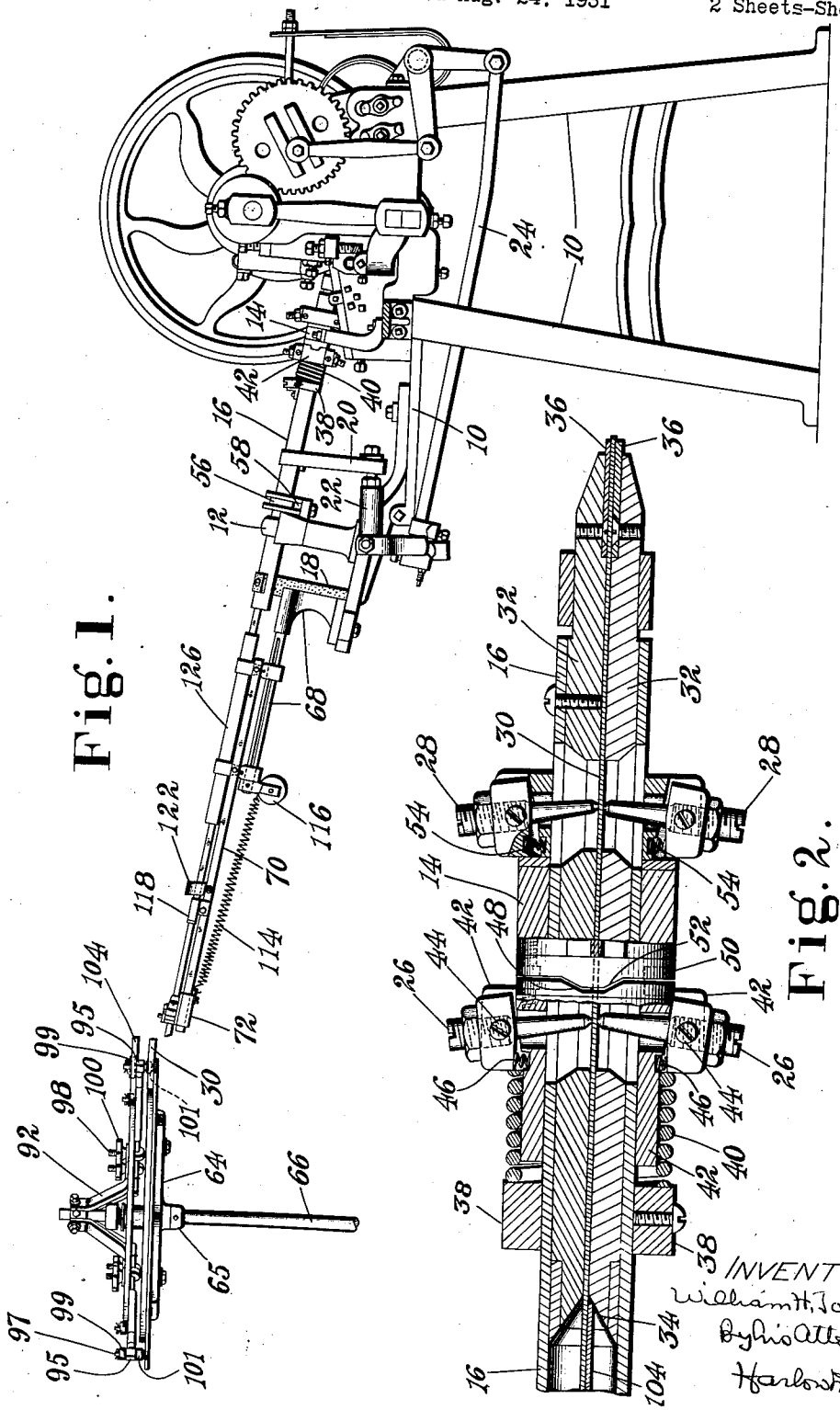


Fig. 1.

Fig. 2.

INVENTOR-
William H. Johnson
By his Attorney,
Harlow M. Davis

Nov. 28, 1933. W. H. JOHNSON 1,936,940

NAIL STRIP FEEDER

Filed Aug. 24, 1931 2 Sheets-Sheet 2

Fig. 3.

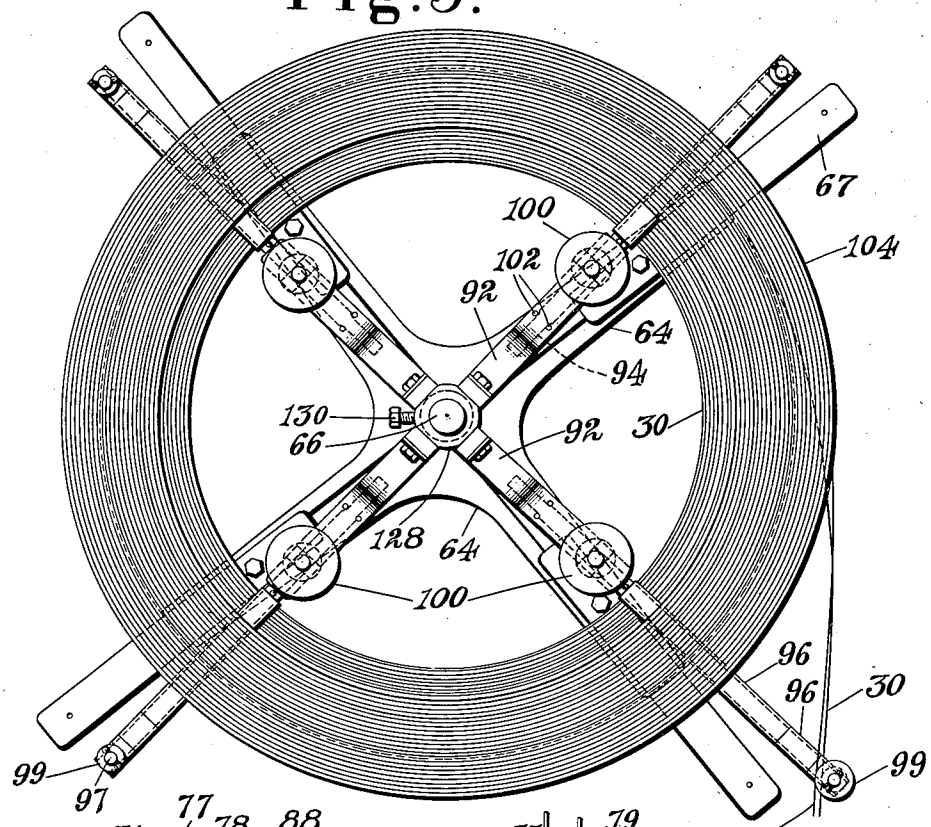
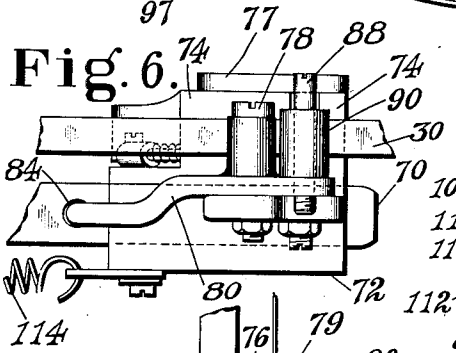
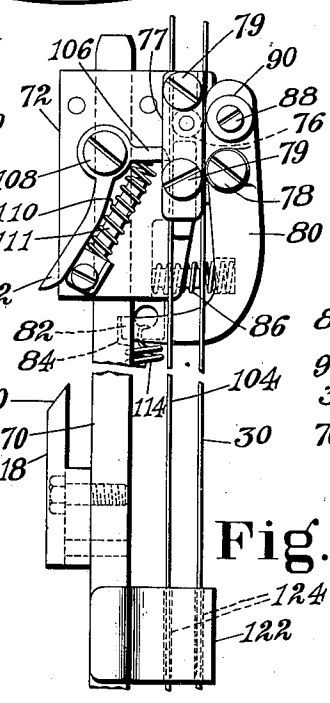


Fig. 6.





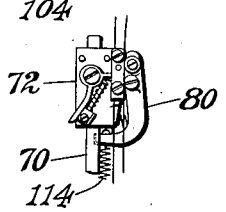


Fig. 7.

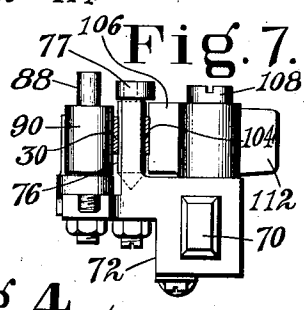


Fig. 5.

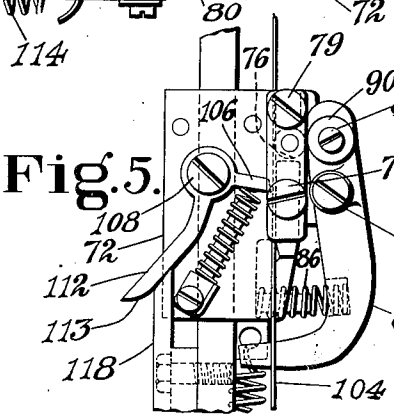


Fig. 4.

INVENTOR-
William H. Johnson
By his Attorney
Hawkins & Dana

Patented Nov. 28, 1933 1,936,940

UNITED STATES PATENT OFFICE

1,936,940

NAIL STRIP FEEDER

William H. Johnson, Arlington, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application August 24, 1931. Serial No. 558,946

20 Claims. (Cl. 10—177)

This invention relates to devices for feeding strip material and is illustrated herein as embodied in a mechanism for advancing nail strips to the operative instrumentalities of a nail-making machine.

Cut nails are commonly formed from nail blanks cut from strips of sheet metal of a width approxmately the same as, or very slightly greater than, the length of the nails. The nail strip material is ordinarily formed in lengths of a few feet and must be fed step-by-step to the cutting dies of the machine. As each strip is used up it is necessary to introduce another strip in its place. This has been done manually to a large extent, though there are in present use large numbers of machines which automatically introduce successive strips into the strip-feeding mechanism when the strip already there has been nearly exhausted.

Nail strips of considerable length and in the form of coils are preferred, by some manufacturers, to the relatively short strips above referred to. Strips of relatively great length in the form of coils are easy to handle, and they present the advantage of not having to be replenished frequently. Furthermore, the use of such long strips greatly reduces the number of irregularly formed nails and pieces of scrap material which result when the butt end of a strip is introduced to the operative instrumentalities of the machine. Regardless of the length of the strip, however, the problem of supplying an additional strip to the machine when the strip being operated upon is used up still remains. Unless some mechanism is provided for automatically supplying an additional strip to the machine as soon as the previous strip is exhausted, the machine must either be stopped or permitted to run idly until the additional strip can be supplied to it. When a large number of machines are in the care of a single operator, as is usually the case, considerable time may elapse before the operator is able to supply an additional nail strip to any particular machine.

It is an object of the present invention to provide mechanism for supplying an additional nail strip to a nail-making machine, which mechanism is adapted to operate upon a coiled nail strip of considerable length as well as upon a relatively short strip. In accordance with this object, a feature of the invention consists in the provision of a support for a reserve coil of nail strip, in combination with a tension spring constructed and arranged to advance the free end portion of the strip to a feeding mechanism with which the nail-making machine is provided. Inasmuch as the strip being operated upon may also be supplied in coiled form, an additional support may be provided for that coil of nail strip. Where, as in the illustrated machine, the feeding mechanism of the machine is constructed and arranged to operate upon a single strip at a time, there may be provided means responsive to the passage of the strip being fed for causing the material of the reserve coil to be advanced to the feeding mechanism in following relation to the strip which is being fed. As herein illustrated, the means for advancing the free end of the reserve coil may comprise mechanism actuated by a feeler which engages the strip being fed. Where, as in the illustrated machine, a guide member is associated with the means for presenting a nail strip to the operative instrumentalities of the machine, this guide member having a passageway of sufficient cross-section to receive the nail strip while preventing the entrance of a second or reserve nail strip in overlapping relation to the first nail strip and being also constructed and arranged to direct the leading end of the nail strip into the passageway, the means for advancing the reserve or second nail strip operates to urge the free end of the coil of reserve nail strip as far as possible toward the presenting means and, as soon as the trailing end of the first nail strip clears the entrance of the passageway, to cause the leading end of the second nail strip to follow the trailing end of the first nail strip far enough into the passageway for the second nail strip to be acted upon by the presenting means.

In accordance with a further feature the reserve nail strip is gripped at a locality between its ends by means carried by a head which is slidably mounted upon a guideway, the head being operable, in response to the passage of the first nail strip, to advance the reserve nail strip toward the nail making machine. Additional means are provided for releasing the reserve nail strip from the gripping means after the head has advanced a predetermined distance. In the illustrated device the head is latched to the guideway until the trailing end of the nail strip which is being operated upon passes the head whereupon the head is unlatched and is moved forwardly by the urging means thereby to advance the reserve nail strip.

These and other features of the invention will be described as embodied in an illustrative machine and pointed out in the appended claims.

Referring now to the accompanying drawings, Fig. 1 is a side elevational view of a nail-mak-

ing machine equipped with the improved device;

Fig. 2 is a vertical longitudinal section of a feed mechanism associated with the machine shown in Fig. 1;

Fig. 3 is a plan view of a support for coils of nail strip;

Fig. 4 is a plan view of a portion of the mechanism shown in Fig. 1;

Fig. 5 is a view similar to Fig. 4, showing certain portions in a different position;

Fig. 6 is a side elevational view of a portion of the mechanism shown in Fig. 4; and

Fig. 7 is a view in end elevation of a portion of the mechanism shown in Fig. 4.

The nail-making machine in connection with which the invention is herein disclosed is of the well-known Perkins type having a frame 10 upon which is supported the usual cutting and heading dies together with their operating mechanism. Supported on the frame 10 are bearing members 12 and 14 in which is mounted a tube or barrel 16 through which the nail strip passes as it is fed to the operating instrumentalities of the nail-making machine. The barrel 16 is oscillated back and forth through an angle of 180° by means of flexible straps 18 and 20 each connected at one end to the tube 16 and at the other end to an arm of one of a pair of bell-crank levers 22. The bell-crank levers 22 are fulcrumed to the frame 10 and are oscillated by means of a connecting rod 24 which is reciprocated by the usual mechanism with which nail-making machines of this type are provided. The tube 16 is thus given one complete oscillation for each rotation of the main shaft of the nail-making machine to the end that the nail strip being operated upon is alternately reversed in its relation to the usual oblique cutting edges of the cutting dies to produce the usual tapered nail blanks.

A mechanism for feeding the nail strip to the cutting dies is shown in Fig. 2. This mechanism comprises a pair of feed pawls 26 and a pair of holding pawls 28 arranged to engage opposite sides of a nail strip 30 which is supported diametrically of the feed barrel 16 by means of suitable blocks 32 arranged to form a passage large enough to permit the strip 30 to be fed therethrough. The blocks 32 are shaped to form at the end into which the strip 30 is introduced a funnel-shaped opening 34 while at their opposite ends they are provided with removable wear plates 36 which form a nozzle to present the strip to the cutting dies of the machine. Clamped to the barrel 16 is a collar 38 forming an abutment for one end of a coil compression spring 40 the other end of which engages against a collar 42 slidably mounted for lengthwise movement upon the barrel 16 and to which are trunnioned as at 44 the feed pawls 26. Small coil compression springs 46 bear against the pawls 26 to maintain the latter in engagement with the nail strip. The forward face of the collar 42 is provided with a plurality of diametrically opposite depressions 48 one of which is shown in Fig. 2. Secured to the bearing 14 is a cam 50 having a pair of diametrically opposite rises 52 complemental in form and located opposite the depressions 48. Thus, as the barrel 16 oscillates, the collar 42 will be reciprocated through a short path, its rearward or idle movement being positive and its forward or feeding movement being under the action of the spring 40. During the feeding movement of the collar 42 the pawls 26 will act to grip and feed the nail strip 30, the holding pawls 28 yielding slightly to permit the passage of the strip while during the rearward movement of the collar 42 the holding pawls 28 will grip and hold the strip while the feed pawls 26 will be dragged backward over the opposite surface of the strip. The holding pawls 28 are maintained in engagement with the strip by means of small coil springs 54.

In order to relieve the pressure of the end of the nail strip against the cutting dies of the nail-making machine during the rotation of the barrel 16, the latter is provided with a cam track 56 (Fig. 1) cooperating with a stationary roll 58, the form of the cam track 56 being such that the barrel 16 is slightly retracted at the commencement of its oscillation and is moved forward the same amount at the conclusion of its oscillation.

The above-described feeding mechanism is disclosed and claimed in United States Letters Patent No. 1,776,260, granted September 23, 1930 upon an application filed in my name.

The nail strip 30, instead of being supplied to the machine in the form of the usual short lengths of strip, may conveniently be supplied in the form of a coil which is carried upon a reel 64 supported for rotation by a collar 65 upon a standard 66. Each arm of the reel 64 is provided with an adjustable extension 67 to enable the reel to accommodate coils of greater or less diameter.

Extending forwardly of the frame 10 is a bracket 68 upon which is mounted a forwardly extending rod 70 which constitutes a guideway or slide for a head 72. Positioned between a pair of upstanding lugs 74 upon the head 72 is a roll 76. A plate 77 bridges the upper ends of the lugs 74 and is secured to each lug 74 by a screw 79. The upper end of the roll 76 is journaled in the plate 79 while the lower end is journaled in the body portion of the head 72. Fulcrumed upon a pin 78 mounted in the head 72 is a bent lever 80 having a reduced end portion 82 constructed and arranged to enter a recess 84 in the slide rod 70 whereby the lever 80 functions to latch the head 72 in fixed relation to the slide rod 70. A coil compression spring 86 interposed between the lever 80 and the head 72 urges the lever 80 into unlatched position. Upon the end of the lever 80 opposite the end 72 is an upstanding pin 88 upon which is mounted a roll 90. The nail strip 30 in its passage to the nail-making machine passes between the rolls 76 and 90 and thus serves to maintain the latching end of the lever 80 in latching engagement with the recess 84. When, however, the greater portion of the strip 30 has been used up and the end of the strip 30 advances from between the rolls 76 and 90, the lever 80 will be free to move to an unlatching position and will immediately be so moved by the compression spring 86, leaving the head 72 free to slide upon the rod 70. The roll 90 is thus responsive to the presence or absence of the strip 30, functioning as a feeler.

Mounted upon the standard 66 and in fixed relation thereto are a plurality of radially extending arms 92. Clamped to the arms 92 and constituting, in effect, extensions of these arms are bearing pins 94 upon each of which are mounted a plurality of rollers 96. The outer end portion of each pin 94 is enlarged to form a head 95 (Fig. 1) to retain the rollers 96. Extending through each of the heads 95 is a pin 97 upon which are mounted upper and lower rolls 99 and 101 respectively. The inner end portions of the

bearing pins 94 are received loosely through the eyes of clamping bolts 98 upon the threaded shanks of which are tightening nuts 100 whereby the pins 94 may be clamped against the under surfaces of the arms 92. In order to maintain the pins 94 in alinement with the arms 92, each arm is provided with a pair of depending pins 102 between which passes the reduced inner end of the pin 94. The fixed arms 92 in the illustrated machine are mounted above the reel 64 and their purpose is to support an additional coil of nail strip 104. The rollers 96 enable the strip 104 as it is advanced to the nail-making machine to uncoil, the coil being allowed to rotate at varying linear speeds at varying distances from its center. It is apparent that at any time after the coil of nail strip 30 has been exhausted the clamping bolts 100 may be loosened and the pins 94 together with their rollers 96 may be removed from the arms 92, thereby permitting the coil of nail strip 104 to drop upon the arms of the reel 64. The pins 94 together with their rollers may then be replaced and a new coil of nail strip to take the place of the coil 104 may be replaced upon the rollers 96.

The leading end of the reserve nail strip 104 is introduced manually into the barrel 16 as far as it will go. The funnel-shaped opening 34 above referred to converges toward the entrance of the passageway for the nail strip 30 which is provided between the two blocks 32. This passageway is wide enough to accommodate only one nail strip at a time so that the reserve nail strip 104 is prevented from entering the passageway until the trailing end of the nail strip 30 has entered the passageway whereupon the funnel-shaped opening 34 serves to guide the leading end of the reserve nail strip 104 into the passageway in following relation to the trailing end of the nail strip 30. The blocks 32 thus function as a guide member for the nail strips, the funnel-shaped opening 34 constituting the receiving portion of the guide member. The nail strip 104 is clamped to the head 72 by means of a pawl 106 pivoted upon a pin 108 carried by the head 72. The pawl 76 is urged toward clamping position by means of a compression spring 110 whereby the pawl 106 clamps the nail strip 104 against one of the upstanding lugs 74. The spring 110 surrounds and is thus supported by a bar 111. The pawl 106 is provided with a tail 112 having a beveled end 113 for a purpose presently to be described.

A coil tension spring 114 (Fig. 1) is interposed between the head 72 and the forward end of the bracket 68, tending thus to advance the head 72 along the rod 70 toward the nail-making machine. As an alternative to the spring 114 a pulley 116 may be mounted upon the forward end of the bracket 68 to accommodate a cable one end of which may be attached to the head 72 and the other end of which may carry a weight.

Secured to the slide 70 is a block 118 (Figs. 1, 4 and 5) having an inclined cam face 120 positioned in the path of the tail 112 of the pawl 106 as the block 72 is advanced along the slide. As the beveled end 113 of the tail 112 of the pawl engages the inclined surface 120, the pawl will be rotated in a clockwise direction, as viewed in Fig. 5, and the clamping pressure against the reserve nail strip 104 will be released. The advancing movement of the block 72 will also be stopped positively by the engagement of the pawl 106 with the end of the bar 111, the spring 110 serving as a cushion.

A guide bock 122 is also mounted upon the slide 70 and is provided with a pair of slots 124 through which pass the nail strips 30 and 104, respectively. The portions of the nail strips which engage the blocks 32 of the feed mechanism will partake of the oscillatory movement of the feed mechanism. The slots 124 serve to prevent this oscillatory movement of the nail strips from manifesting any effect between the guide block 122 and the coils. It will be noted that the nail strips have no oscillatory movement at the point where they engage the various instrumentalities carried by the head 72. Between the guide block 122 and the feed barrel 16 is a stationary tube 126 which is mounted upon a bracket 68. The tube 126 houses a portion of the nail strips which is subject to oscillatory movement and serves to prevent damage to the operator by accidental contact with this portion of the nail strips. It also serves as a guide in introducing nail strips into the barrel 16.

As shown in Fig. 3, the arms 92 are all secured upon a ring 128 which may be locked to the standard 66 in any desired position of rotary adjustment by means of a set screw 130. Such provision for rotary adjustment renders it convenient, in setting up the standard 66, to position one of the arms 92 so that the rolls 99 and 101 carried upon the extremity of the pin 94 of that arm will serve as guides for the nail strips 104 and 30 as they leave their respective coils in passing to the nail-making machine. The nail strips 104 and 30 are thus prevented from bowing outwardly and loosening their respective coils. If necessary for the proper positioning of these rolls 99 and 101, the pin 94 which carries them may be adjusted radially by loosening its clamping nut 100, moving the pin 94 in or out the desired distance, and tightening the clamping nut. The roll 99 of that particular arm 92 is preferably of a larger diameter than the other rolls 99 and than the rolls 101. The other rolls 99 serve to retain the coil of the strip 104 from outward radial movement off the rollers 96, while the other rolls 101 serve similarly to retain the coil of the strip 30 from outward radial movement.

The standard 66 of the illustrated machine is shown in Fig. 1 as substantially vertical. This standard may, however, if desired, be so inclined as to tilt the two coils of nail strip, causing them to slope in the direction of the feed barrel 16 to avoid a sudden change in direction as each strip leaves its coil.

The operation of the above-mentioned instrumentalities will now be described. Assuming that the nail-making machine is running and that coils of nail strip 30 and 104 have been deposited upon the reel 64 and the rollers 96, respectively, the operator takes the leading end of the nail strip 30 and threads it between the roll 90 and the roll 76. In order to do this, it is necessary for him to press the latching end 82 of the lever 80 into the recess 84. The leading end of the nail strip 30 is then threaded into the outer guide slot 124 through the tube 126 and into the feed barrel 16. The leading end of the nail strip 30 will be guided by the funnel-shaped surfaces 34 of the passageway between the blocks 32 until it has advanced past the feed pawls 26 and the holding pawls 28. The nail strip 30 will thereafter be advanced by the automatic mechanism to the operative instrumentalities of the nail-making machine. The operator then proceeds to thread the reserve nail strip 104 between the pawl 106 and one of the

upstanding lugs 74 (the left-hand one as viewed in Fig. 6), then through the inner guide slot 124, through the guide tube 126, and into the feed barrel 16 as far as it will go. The operator then releases the pawl 106 whereupon the spring 110 causes the pawl to clamp the nail strip 104 against the lug 74. It will be noted that as long as the nail strip 30 is between the rolls 76 and 90, the latching end 82 of the lever 80 will be maintained within the recess 84, and the head 72 will thus be latched to the slide 70. As the trailing end of the nail strip 30 passes from between the rolls 76 and 90, the latch lever 80 will be urged by the spring 86 in a counter-clockwise direction, as viewed in Fig. 4, and the head 72 will thereby become unlatched from the slide 70. The spring 114 will then become operative to urge the head 72 and with it the nail strip 104 toward the machine. The leading end of the strip 104, however, will be unable to enter the passageway between the blocks 32 until the trailing end of the nail strip 30 has entered this passageway whereupon the funnel-shaped walls 34 will guide the leading end of the nail strip 104 into following relationship with the trailing end of the nail strip 30 into the passageway between the blocks 32, and the spring 114 will advance the nail strip 104 as rapidly as permitted by the advance of the nail strip 30 until the nail strip 104 is engaged by the automatic feed mechanism. As the block 72 continues to advance, the tail 112 of the pawl 106 will be engaged by the inclined surface 120 of the block 118, and the nail strip 104 will be released from the clamping members of the head 72. The stopping of the travel of the head 72 will therefore not interfere with the feed of the nail strip 104. The operator now has ample time, in going his rounds in attending a number of these machines, to replenish the nail strip 104 with a new nail strip. He does this by releasing the clamping bolts 100 and withdrawing the pins 94 together with their rollers 96, thereby permitting the strip 104 to drop upon the reel 64. He then replaces the pins 94 together with their rollers upon the spider arms 92 and deposits the new strip upon the rollers 96. Next he returns the head 72 toward its normal or latched position, holding the pawl 106 out of clamping engagement with the nail strip 104. Then he holds the latch 80 in latching position with its end 82 within the recess 84, raises the nail strip 104 from between the pawl 106 and the lug 74 and inserts it between the roll 90 and the roll 76. As soon as he raises the nail strip 104, he may release the pawl 106. In order to facilitate insertion of the nail strip between the two rolls above mentioned, the roll 90 may be slipped upwardly off its spindle 88 and after the nail strip has been lowered into position against the roll 76 the roll 90 may again be placed upon its spindle 88. The presence of the nail strip 104 between rolls 76 and 90 serves to hold the latch 80 in its latching position. The operator then proceeds to thread the additional reserve nail strip to the various instrumentalities leading to the automatic feed device in the same manner as has already been described with reference to the nail strip 104.

It is evident that the mechanism herein disclosed may also be employed for replenishing straight nail strips of relatively short length. For such use the standard 66 and the members supported by it will not be necessary. Since the pawl 106 and the upstanding lug 74 grip the strip at a locality between the ends of the strip, the position of the end of the strip beyond the clamping device, and hence the length of the strip is immaterial to the functioning of the replenishing mechanism.

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

1. In combination with a machine for operating upon coiled metallic nail strip, a support for two coils of nail strip, said support being constructed and arranged to enable the coils to unwind as the strips are advanced to the operating instrumentalities of the machine, means for feeding the strip from one of the coils on said support to the operating instrumentalities of the machine, a guide constructed and arranged to admit a single strip and to prevent more than a single strip at a time from passing to said feeding means, and means responsive to the passage of the strip being fed for causing the strip from the other coil on said support to be advanced through said guide to said feeding means in following relation to the strip which is first presented to said feeding means.

2. In combination with a nail-making machine, a support for a coil of nail strip, means for supporting a second coil of nail strip, said support and said supporting means being constructed and arranged to enable the coils to unwind as the nail strips are advanced to the operating instrumentalities of the machine, means for feeding the first-mentioned nail strip to the operating instrumentalities of the machine, and means actuated by the first-mentioned nail strip in its passage to the operating instrumentalities of the machine for advancing the second-mentioned nail strip, with the leading end of the second-mentioned nail strip following the trailing end of the first-mentioned nail strip, into the control of said feeding means.

3. In combination with a nail-making machine provided with mechanism for feeding a nail strip to the operating instrumentalities of the machine, a support for two coils of nail strip, said support being constructed and arranged to enable the coils to unwind as the nail strips are fed to the operating instrumentalities of the machine, and means for causing the leading end of the nail strip of one of said coils to follow the trailing end of the nail strip of the other coil into position to be acted upon by the feeding mechanism of the machine.

4. In combination with a nail-making machine provided with mechanism for feeding a nail strip to the operating instrumentalities of the machine, a support for two coils of nail strip, said support being constructed and arranged to enable the coils to unwind as the nail strips are fed to the operating instrumentalities of the machine, and means for advancing the nail strip of one of said coils into position to be acted upon by said feeding means after the nail strip of the other coil has passed said feeding means.

5. In combination with a nail-making machine having an automatic feed mechanism and having a member constructed and arranged to guide only one nail strip at a time to said feed mechanism and at the same time to direct the leading end of a reserve nail strip into position to follow the trailing end of a prior nail strip already under control of said feed mechanism, a support for a coil of reserve nail strip, means constructed and arranged to urge the free end

portion of the reserve nail strip while overlapped by the trailing end of the prior nail strip as far toward said automatic feed mechanism as permitted by said guide member and by the prior strip and thereafter to cause the reserve strip to follow the prior strip to said automatic feed mechanism.

6. In a nail-making machine, means for operating on a nail strip, means for presenting a nail strip to the operating means, a guide member associated with said presenting means and having a passageway of sufficient cross-sectional area to receive a nail strip while preventing the entrance of a second nail strip in overlapping relation to the first nail strip, said guide member being constructed and arranged to direct the leading end of a nail strip into said passageway, a support for a coil which constitutes a second or reserve nail strip, and means for urging the free end portion of the coil of reserve nail strip as far as possible toward said presenting means and operable as soon as the trailing end of the first nail strip clears the entrance of the passageway to cause the leading end of the reserve nail strip to follow the trailing end of the first nail strip far enough into said passageway for the reserve nail strip to be acted upon by said presenting means.

7. In a nail-making machine, means for operating on a nail strip, means for presenting a nail strip to the operating means, a guide member associated with said presenting means, said guide member having a passageway of sufficient cross-sectional area to accommodate only one nail strip at a time and having a receiving portion formed to direct the leading end of a nail strip into said passageway, a support for a coil which constitutes a second or reserve nail strip, and means for urging the free end portion of the coil of reserve nail strip into the receiving portion of said guide member as far as permitted by a prior nail strip which already occupies said passageway and the trailing end of which overlaps the leading end of the reserve strip, said urging means being operable to cause the leading end of the reserve strip to follow the trailing end of the prior strip into said passageway far enough for the reserve strip to be acted upon by the presenting means.

8. In a nail-making machine, means for operating on a nail strip, means for presenting a nail strip to the operating means, a guide member associated with said presenting means and having a passageway of sufficient cross-sectional area to receive a nail strip while preventing the entrance of a second nail strip in overlapping relation to the first nail strip, said guide member having a portion which converges toward the entrance of said passageway to direct the leading end of a nail strip into said passageway, a support for a coil which constitutes a second or reserve nail strip, and means for urging the free end portion of the coil of second nail strip as far into said converging portion as permitted by the overlapping trailing end of the first nail strip, said urging means being effective to cause the leading end of the second nail strip to follow the trailing end of the first nail strip far enough into said passageway to be acted upon by said presenting means.

9. In a nail-making machine, means for operating on a nail strip, means for presenting and progressively feeding a nail strip to the operating means, a support for a coil which constitutes a second or reserve nail strip, means for urging the free end portion of the coil of second nail strip toward said presenting and feeding means, and a member constructed and arranged by engagement with the second nail strip to hold back the second nail strip against the force of said urging means until the trailing end of the first nail strip has advanced beyond a predetermined point and then to guide the leading end of the second nail strip to said presenting and feeding means.

10. A device for supplying a reserve nail strip to a nail-making machine, comprising a guideway, a head slidably mounted on said guideway, a gripper on said head for holding a reserve nail strip between the ends of the reserve nail strip, means for urging said head along said guideway to advance the reserve nail strip toward the machine, means for normally restraining said head from movement along said guideway, and means actuated by the passage of a strip being operated upon by the machine to release said urging means from said restraining means.

11. A device for supplying a coiled reserve nail strip to a nail-making machine, comprising a guideway, a head slidably mounted on said guideway, a support for a coil of reserve nail strip, a gripper on said head for holding the reserve nail strip at a locality between the free end of the reserve nail strip and the coil, means for urging said head along said guideway to advance the reserve nail strip toward the machine, means for normally restraining said head from movement along said guideway, means actuated by the passage of a strip being operated upon by the machine to release said urging means from said restraining means, and means actuated by the advancing movement of said head to release the reserve nail strip from said gripper after said head has been advanced a predetermined distance by said urging means.

12. A device for supplying a reserve nail strip to a nail-making machine, comprising a guideway, a head slidably mounted on said guideway, means on said head for gripping a reserve nail strip, means for urging said head along said guideway to advance the reserve nail strip, means for restraining said head from such movement along said guideway, and a feeler on said head engageable with another nail strip and constructed and arranged when passed by the trailing end of said other nail strip to release said head from said restraining means, thereby enabling said urging means to advance said reserve nail strip.

13. A device for supplying a coiled reserve nail strip to a nail-making machine, comprising a guideway, a head slidably mounted on said guideway, a support for a coil of reserve nail strip, a spring-pressed pawl on said head for gripping a reserve nail strip at a locality between the free end of the reserve nail strip and the coil, a spring for urging said head along said guideway to advance the reserve nail strip, a latch for restraining said head from advancing along said guideway, and means responsive to the passage of another nail strip for unlatching said latch, thereby enabling said spring to advance said reserve nail strip.

14. A device for supplying a reserve nail strip to a nail-making machine, comprising a guideway, a head slidably mounted on said guideway, means on said head for gripping a reserve nail strip, means for urging said head along said guideway to advance the reserve nail strip, a latch for holding said head to said guideway, and means on said head engageable with another nail strip and constructed and arranged when the

trailing end of said other nail strip passes said head to unlatch said latch, thereby enabling said urging means to advance said reserve nail strip.

15. A device for supplying a reserve nail strip to a nail-making machine, comprising a guideway, a head slidably mounted on said guideway, means on said head for gripping a reserve nail strip, means for urging said head along said guideway to advance the reserve nail strip, means for latching said head to said guideway, means on said head engageable with another nail strip and constructed and arranged when the trailing end of said other nail strip passes said head to unlatch said latching means, thereby enabling said urging means to advance said reserve nail strip, and means operable after said head has been urged a predetermined distance along said guideway to release the grip of said gripping means upon said reserve nail strip.

16. In combination with a nail-making machine having an oscillatory feed device, means engageable with a nail strip being fed to the machine and responsive to the passage of that strip to supply a reserve nail strip to the feed device, and means positioned between the feed device and said supplying device to prevent the oscillatory movement of the first-mentioned nail strip from extending to said supplying device.

17. In combination with a nail-making machine having an oscillatory feed device, a feeler engageable with a nail strip being fed to the machine, mechanism actuated by said feeler upon the passage of the trailing end of the nail strip past said feeler to supply a second nail strip to the feed device, and means interposed between the feed device and said feeler to prevent the oscillatory movement of the first-mentioned nail strip from extending to said feeler.

18. In combination with a nail-making machine having mechanism for feeding a nail strip to the operating instrumentalities of the machine, a support for a coil of nail strip, means for gripping the nail strip, and a tension spring secured to said gripping means and constructed and arranged to advance the free end portion of the coil of nail strip on said support to the feeding mechanism of the nail-making machine.

19. In combination with a nail-making machine having mechanism for feeding a nail strip to the operating instrumentalities of the machine, a support for a coil constituting a reserve nail strip, and means responsive to the passage of a strip being operated upon to advance the free end of the coil of reserve strip to the feeding mechanism in following relation to the strip being operated upon.

20. In combination with a nail-making machine having an automatic mechanism for feeding a nail strip to the operating instrumentalities of the machine, a support for a coil constituting a reserve nail strip, a feeler engageable with a nail strip which is being fed by said feeding mechanism, and means actuated by said feeler upon the exhaustion of the strip being fed to present the free end portion of the coil of reserve strip on said support to the feeding mechanism.

WILLIAM H. JOHNSON.