C. PERKINS.

MACHINE FOR USE IN THE MANUFACTURE OF NAILS.

APPLICATION FILED MAR. 30, 1915.

1,254,157.

Patented Jan. 22, 1918.

2 SHEETS—SHEET 1.

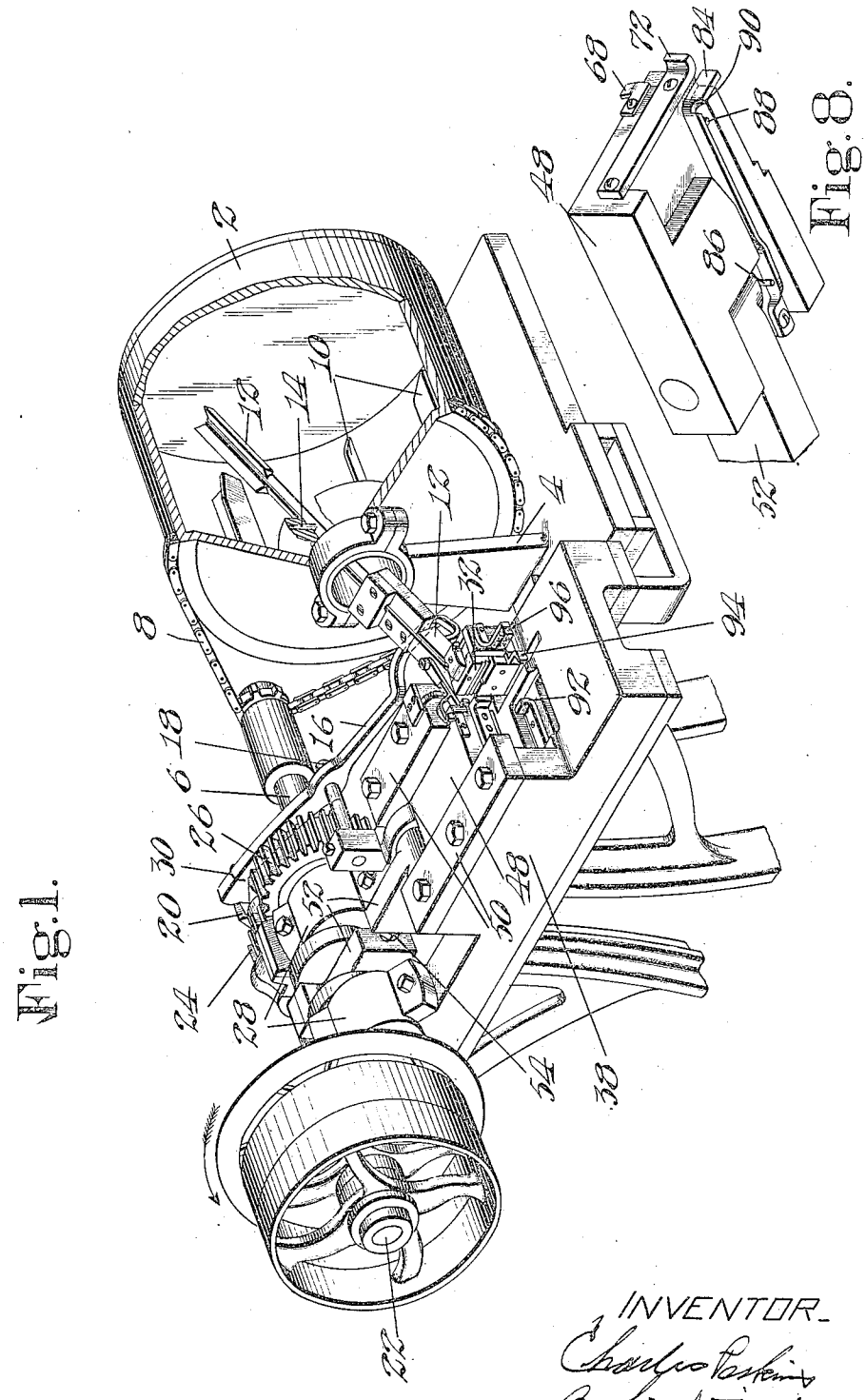

Fig. 1.

Fig. 8.

INVENTOR.

Charles Perkins

By his Attorney

Nelson H. Conrad

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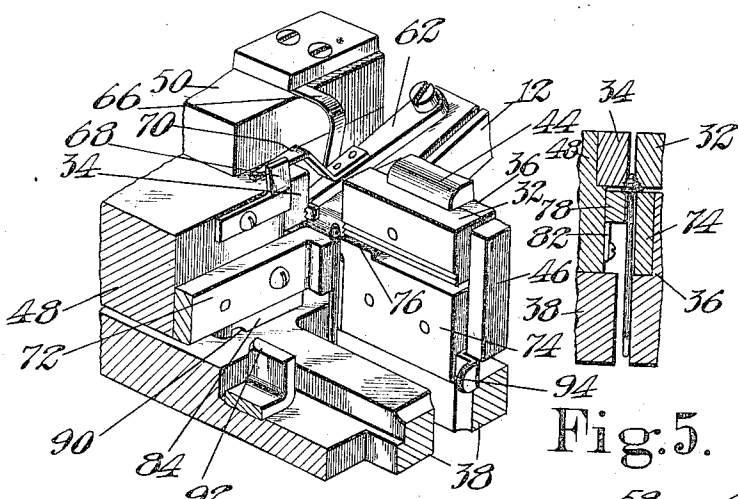

Fig. 2.

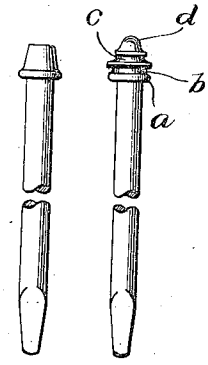

Fig. 6.

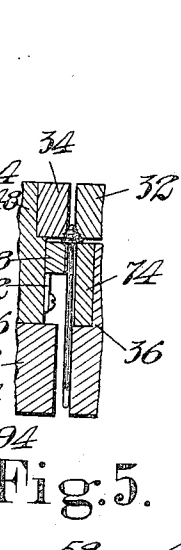

Fig. 5.

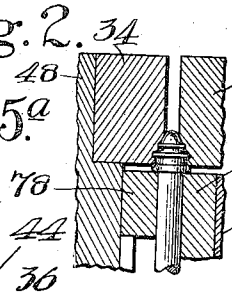

Fig. 5a

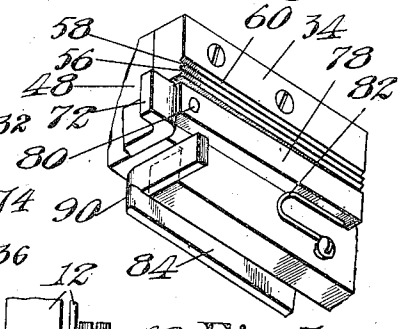

Fig. 7.

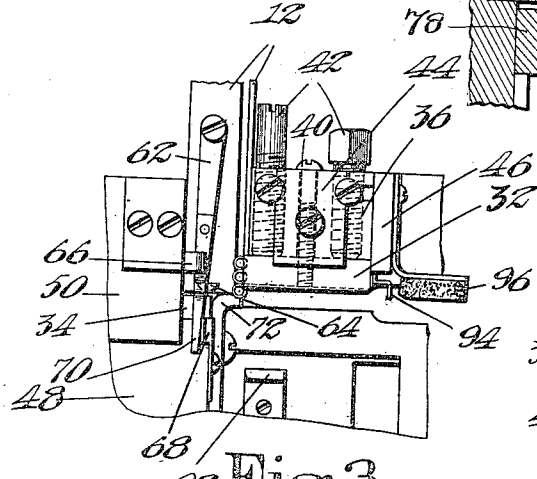

Fig. 3.

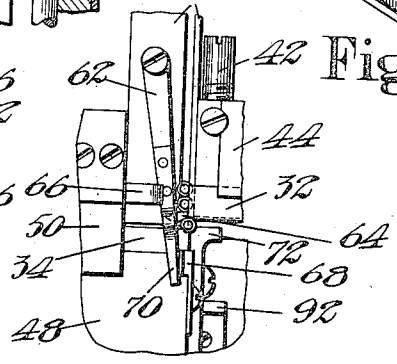

Fig. 4.

INVENTOR.

Charles Perkins

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UNITED STATES PATENT OFFICE.

CHARLES PERKINS, OF BRIDGEWATER, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR USE IN THE MANUFACTURE OF NAILS.

1,254,157. Specification of Letters Patent. Patented Jan. 22, 1918.

Application filed March 30, 1915. Serial No. 17,989.

To all whom it may concern:

Be it known that I, CHARLES PERKINS, a citizen of the United States, residing at Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain Improvements in Machines for Use in the Manufacture of Nails, 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 use in making nails or like articles of manufacture, and an object of the invention is to effect improvements in that class of machines which operate to shape or form the nails by rolling them between coöperating dies.

A more particular object of the invention is to provide an improved machine for use in the manufacture of what are known as "collar" nails. A nail of this type has a distinct enlargement in the form of a collar which encircles the nail at some point between its ends. Such nails are used extensively in the manufacture of boots and shoes for attaching the heels to the heel seat portions of the soles. As formed for such use the nail is provided with a collar at a short distance from its head end and is suitably shaped between the collar and said end for retaining the toplift of the heel which is "spanked" upon the projecting ends of the nails after the nails have been driven as far as permitted by their collars in the heel attaching operation. In order that the toplift may be securely held in place these nails usually are formed with one or more transverse corrugations above their collars. An important object of this invention accordingly is to provide improved mechanism for shaping that portion of the nail which lies between its collar and its head end.

For accomplishing the above stated objects the invention provides, as one of its features, a novel organization of mechanism comprising a pair of relatively movable dies arranged for rolling nails between them and so formed as to impart the desired shape to the nails as they are rolled, and means for presenting nails one by one at determined intervals in position to be received between the dies. As herein shown, one die is arranged to reciprocate at the side of the coöperating die so as to roll and discharge a nail at each reciprocation, and the nails to be operated upon are delivered from a raceway into position to be received between the dies, the delivery of the nails being controlled by a separator which is operated by the movement of the movable die.

A further feature of the invention consists in the combination of dies relatively movable to roll and shape the nails, and means for controlling the longitudinal position of the nails to maintain them in proper position to be operated upon by the dies while they are rolled. In the illustrated construction the dies are suitably formed to corrugate the nails transversely between their collars and their head ends, and the controlling means is constructed to support the nail by its collar. The construction provides a rigid support for the nail at the beginning of its movement and a yielding support during the remainder of its movement in order to permit endwise expansion of that portion of the nail which is operated upon by the dies.

Another feature of the invention consists in means for corrugating transversely that portion of a collar nail between its collar and its head end and means for beveling or rounding the edge of the nail at its head end. For accomplishing this object the invention provides dies suitably formed for corrugating and for beveling the respective portions of the nail, and means for maintaining the nail in proper position for effective treatment by the dies. Nails thus formed are particularly desirable for use in the attachment of heels to shoes, since the beveled or rounded edge at the end of the nail permits the toplift of the heel to be readily forced into place and the corrugated portion serves effectively to retain the toplift in position.

The above and other features of the invention, including certain details of construction and combinations of parts, will now be described with reference to the accompanying drawings and pointed out in the claims.

In the drawings:

Figure 1 is a perspective view of a machine embodying the preferred form of the invention,

Fig. 2 is an enlarged detail view of por-

tions of the dies and the nail supplying means showing a nail in position to be received and rolled between the dies,

Fig. 3 is a plan view of the portion of the machine seen in Fig. 2,

Fig. 4 is a view similar to Fig. 3 showing the parts in a different position,

Fig. 5 is a cross section through the dies and their nail supporting means illustrating the manner of treatment and control of the nail,

Fig. 5ª is an enlarged detail of a portion of Fig. 5,

Fig. 6 shows a nail before and after treatment by the machine,

Fig. 7 is a side view showing one of the dies and the yielding support for the nail below the die, and

Fig. 8 is a perspective view of the bottom portion of the movable die carrier.

The nails which are to be operated upon are contained in a cylindrical hopper 2 which is supported at its opposite ends for rotation in bearings carried by suitable standards, one of which is seen at 4, and during the operation of the machine is rotated continuously from a counter shaft 6 by means of a sprocket chain connection 8. Lips 10 on the inside of the hopper serve to elevate the nails and deposit them upon a slotted chute or raceway 12 which projects into the hopper through an opening in one of its ends within one of the supporting bearings and leads to the point at which the nails are delivered to the nail shaping mechanism. A portion of the nails delivered from the lips 10 assume an upright position in the raceway with their shanks depending through the slot and their collars supported by the walls at opposite sides of the slot, while those that fail to assume such a position return to the main supply at the bottom of the hopper. A circular brush 14 which rotates with the hopper serves to straighten the nails in the raceway and to remove from the raceway any nails which are improperly positioned thereon. In order to prevent the nails from sticking in the raceway and to insure their advance to the delivery point, the machine includes a tapper 16 pivoted at 18 on a standard on the frame and operated by a ratchet wheel 20 on the main shaft 22, this shaft carrying a gear 24 in mesh with a gear 26 on the counter shaft 6 whereby rotation of the counter shaft in its bearings 28 is effected. One end of the tapper is maintained normally in contact with the ratchet wheel 20 by means of a spring a portion of which is seen at 30, and the other end projects under the raceway 12 in position to strike the raceway during the rapid vibration of the tapper which is effected, as will be readily understood, by the coöperation of the ratchet wheel 20 and the spring 30. This jarring of the raceway insures the proper advance of the nails to the delivery point.

The illustrated machine is designed particularly for operating upon collar nails having heads of frusto-conical shape, as shown at the left in Fig. 6, in order to produce finished nails of the shape shown at the right in said figure. The finished nail, as shown, is corrugated transversely between its collar *a* and its head end, the corrugations comprising two grooves *b* and *c*, and is beveled or rounded at the edge on its head end as shown at *d*. The groove *c*, it will be observed, is nearer the center line of the nail than the groove *b*, and the diameter of that portion above the groove *c* is smaller than the diameter of the portion between the two grooves. The nail thus presents substantially a tapered form above the collar. A nail of this form is particularly useful for attaching heels to shoes in the manner previously explained, since the toplift may be readily driven into place on the tapered ends of the nails and is effectively retained in position by the corrugations in the nails.

For shaping the nails as above described the machine is provided with a pair of dies 32 and 34 which coöperate to roll the nails between their opposite working faces. The die 32 is secured in stationary position on a projection 36 on the frame portion 38 of the machine by means of a screw 40 which is threaded into the die and extends loosely through a bore in the projection. A pair of screws 42 which bear upon the rear side of the die serve to adjust the die angularly, and plates 44 and 46 determine respectively the vertical and endwise positions of the die. The die 34 is secured to one side of a carrier 48 which is mounted to reciprocate in guideways on the frame member 38 so as to move the die forward and back at the side of the stationary die 32. The die carrier 48 is retained in position by means of plates 50 and is reciprocated by a pitman 52 connected to a crank on the counter shaft 6.

The pitman is formed of two portions connected by a right and left screw 54 so as to provide for adjustment of the limits of movement of the carrier.

Each of the dies 32 and 34 has a portion of its working face scored longitudinally, the scored portion of the die comprising ridges 56 and 58 for forming respectively the grooves *b* and *c* in the nail and a beveled face 60 for beveling or rounding the edge of the nail end. The working faces of the two dies are identical in shape and the dies are so arranged that similar portions of their working faces coöperate with each other in the same horizontal plane. For operating upon tapered nail heads to form the grooves *b* and *c* as described, it will be

apparent that the ridge 56 does not project so far relatively to the plane of the face of the die as the ridge 58. In order that the dies may operate progressively to shape the nails, the die 32 is so positioned relatively to the path of movement of the die 34, through adjustment of the screws 42, that the distance between its working portion at that end of the die at which the nail is received and the corresponding working portion of the other die is but little less than the diameter of that portion of the nail which is to be operated upon, while its other end from which the nail is discharged is nearer the path of movement of the die 34. The length of the die 32 is so proportioned to the extent of movement of the other die that during the movement of the carrier 48 in one direction a nail is rolled completely across the face of the die 32 and discharged.

As will be evident from an inspection of Figs. 2, 3 and 4 the nails are delivered one by one at the receiving end of the die 32 in position to be advanced between the dies by the engagement of the die 34 with the nail. For this purpose the raceway 12 leads to the end of the die 32, and in order to prevent the nails from advancing to the end of the raceway except when it is required to deliver a nail at the receiving point the machine is provided with a pivoted separator 62 having a nail retaining finger 64 and normally held by means of a spring 66 in position to retain the column of nails in the raceway and prevent them from engaging the movable die 34. This die in its backward or idle movement passes beyond the receiving end of the die 32, as shown in Figs. 2 and 3, and the die carrier 48 is provided with a lug 68 which engages an arm 70 on the separator and swings the separator in opposition to the force of the spring 66 so as to release the column of nails when the carrier is near the limit of its backward movement. In order to limit the movement of the column of nails thus released and to retain the endmost nail in position to be received between the dies, the die carrier 48 is provided with a stop 72 which is opposite to the end of the raceway 12 when the carrier is at its backward limit of movement, as shown in Figs. 2 and 3. As the carrier moves in the opposite direction the finger 64 engages between the first and second nails before the first nail has started its rolling movement between the dies, as shown in Fig. 4. It will thus be evident that during the shaping of each nail the remainder of the nails are retained in the raceway.

In order to maintain the nails in proper position for treatment during their passage between the dies the machine is provided with means for engaging the collar on the nail to determine the longitudinal position of the nail. This means includes a plate 74 mounted below the die 32 and having a ledge 76 spaced from the lower side of the die a distance substantially equal to the thickness of the collar on the nail to serve as a guide for the nail. The end nail in the raceway is presented in position for its collar to enter between the die and the ledge, and the ledge provides a rigid support for the nail as it starts to roll between the dies, maintaining it in proper position for treatment until the corrugations have been well defined. Since the operation of corrugating the nail tends to elongate that portion which is under treatment, the ledge 76 extends for only a short distance from the receiving end of the die so as to permit downward displacement of the collar during the further treatment of the nail. By the time the nail arrives at the end of the ledge the corrugations have been sufficiently well defined to cause the nail to tend to follow its proper course along the ridges 56 and 58. Additional support for the nail throughout its movement, however, is afforded by means of a guide bar 78 pivoted on the die carrier 48 at 80 below the receiving end of the die 34 and extending the length of the die. The free end of the bar is operated upon by a spring 82 to swing it toward the die. The bar at its pivoted end is spaced below the die substantially the same distance as the ledge 76 below the die 32. It will thus be apparent that the collar of the nail at the beginning of the operation is supported in a substantially rigid manner on opposite sides of the nail, and that after the nail has passed beyond the ledge 76 it is yieldingly supported by the bar 78 throughout the remainder of its movement. The yielding support affords additional insurance that the nail shall maintain its proper relation to the dies and at the same time permits longitudinal displacement of portions of the nail through expansion.

The engagement of the movable die 34 with the head portion of the nail to carry the nail between the dies has a tendency to tilt the nail, causing its shank portion to swing in a direction opposite to the direction of movement of the die. To obviate this tendency and maintain the nail substantially perpendicular to the ridges on the dies at the beginning of its movement, the die carrier 48 is provided on its lower side with a pusher 84 comprising a bar of spring metal normally positioned by means of pins 86 and 88 to cause its forward end to engage the shank of the nail as the die carrier moves forwardly. The pusher thus tends to maintain the nail in upright position as it starts to roll. Since the die carrier moves forwardly, however, faster than the nail, it is necessary to cause the pusher to clear the

nail directly after the nail has fairly started its rolling movement. To this end the member 84 is recessed at 90 and a cam 92 is secured to the frame 38 in position to enter the recess and by engagement with the longitudinal straight side of the member 84 to withdraw its forward end portion from the path of the nail.

Beyond the delivery end of the die 32 a stop 94 is provided for directing the finished nails downwardly into a suitable chute or receptacle, not shown. A wiper 96 also is mounted at this end of the die in position to engage the face of the die 34 and remove from the scores or ridges any foreign matter that may lodge thereon.

From the preceding description it will be apparent that in the operation of the machine the column of nails in the raceway 12 is released by the separator 62 at each backward movement of the die carrier 48 so as to permit the end nail of the series to advance into engagement with the stop 72 in position to be received between the dies, as shown in Figs. 2 and 3. As the die carrier moves forwardly, the stop retains the nails in this position until the separator again assumes its normal position as shown in Fig. 4. The die 34 now engages the nail and causes it to roll between its working face and that of the die 32, the pusher 84 at this time preventing any substantial tipping of the nail and the supports 76 and 78 maintaining the nail in proper relation to the working portions of the dies in the manner previously explained. After the nail has fairly started on its course the pusher 84 is withdrawn from behind the nail by means of the cam 92. As the die 34 continues its movement the head portion of the nail is gradually compressed and shaped between the converging faces of the dies until the nail is finally discharged at the end of the die 32. During this movement the nail is at first rigidly upheld by means of the supports 76 and 78, and is subsequently supported yieldingly by the member 78 until it is discharged from the dies.

It will be apparent that the invention, in its broader aspects, is not limited in utility to the shaping of articles of the precise character herein shown, and that the details of construction of the illustrative machine, moreover, may be variously modified consistently with the scope of the claims.

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

1. A machine of the class described having, in combination, a pair of coöperating dies relatively movable to roll nails between their opposite working faces, a raceway terminating at the path of relative movement of the dies for delivering nails in position to be received between the dies, a separator for alternately releasing and withholding the nails in the raceway, and means operated by the relative movement of the dies to cause the separator to release a nail when the dies are in position to receive it.

2. A machine of the class described having, in combination, a pair of coöperating dies relatively movable to roll nails between their opposite working faces, a raceway having its delivery end portion extending in transverse relation to the path of relative movement of the dies and terminating in position to present nails in the plane between the working faces of the dies, and means for releasing the nails in the raceway intermittently to cause the nails to be immediately presented one by one successively in said plane.

3. A machine of the class described having, in combination, a pair of coöperating dies one of which is movable back and forth at the side of the other die for rolling nails between the dies, a raceway terminating in position to present nails in the plane between the working faces of the dies, a separator movable transversely of the raceway for alternately releasing and withholding the nails, and means for moving the separator to release the column of nails in the raceway at approximately the end of the movement of said movable die in one direction.

4. A machine of the class described having, in combination, a pair of coöperating dies relatively movable to roll nails between their opposite working faces, a raceway sloping downwardly and terminating at the end of one of the dies in position to cause nails to advance by gravity to the plane between the working faces of said dies, a stop movable with one of the dies into and out of position at the end of said raceway, a separator for the nails in the raceway, and means for operating said separator to release the nails when said stop is opposite to the end of the raceway.

5. A machine of the class described having, in combination, a pair of coöperating dies arranged for relative movement to roll nails between their opposite working faces, said dies having their working faces formed for corrugating the nails as they are rolled, and means for controlling the longitudinal position of the nails during their movement between the dies.

6. A machine of the class described having, in combination, a pair of coöperating dies arranged for relative movement to roll nails between their opposite working faces, said dies having their working faces formed for corrugating a portion of each nail as it is rolled, and means for controlling the longitudinal position of the nail in its movement between the dies, said controlling means being formed to leave both ends of the nail

free for longitudinal expansion during the operation of the dies on the nail.

7. A machine of the class described having, in combination, a pair of coöperating dies arranged for relative movement to roll nails between their opposite working faces, said dies having their working faces formed for corrugating the nails as they are rolled, and means for supporting the nails during their movement between the dies, said means being constructed for yielding movement to permit the nails to expand longitudinally during the operation of the dies.

8. A machine of the class described having, in combination, a pair of coöperating dies arranged for relative movement to roll nails between their opposite working faces, said dies having their working faces formed for corrugating the nails as they are rolled, and means for supporting the nails in their passage between the dies, said means being constructed to provide a rigid support for the nail at the beginning of its movement and a yielding support during the remainder of its movement between the dies.

9. A machine of the class described having, in combination, a pair of coöperating dies relatively movable to roll nails between their opposite working faces by engagement with portions of the nails adjacent to their head ends, means for presenting the nails in position to be received between the dies, and means for engaging the shank of each nail below the portion engaged by the dies to maintain the nail in predetermined angular relation to its path of movement as it starts to roll between the dies.

10. A machine of the class described having, in combination, a pair of coöperating dies arranged for relative movement to roll nails between their opposite working faces, said dies having longitudinal scores in their working faces for corrugating the nails, means for presenting the nails in position to be received between the dies, and means movable in unison with one of the dies for maintaining each nail in substantialy perpendicular relation to the scores in the dies as the nail begins to roll between the dies.

11. A machine of the class described having, in combination, a pair of coöperating dies arranged for relative movement to roll nails between their opposite working faces, said dies having longitudinal scores in their working faces for corrugating the nails, means for presenting the nails in position to be received between the dies, means below the dies for engaging the shank of each nail as the nail begins to roll between the dies to maintain the nail in substantially perpendicular relation to the scores in the dies, and means for withdrawing said engaging means from the nail after the nail has traversed a portion only of the working faces of the dies.

12. A machine of the class described having, in combination, a pair of coöperating dies one of which is stationary and the other arranged for movement back and forth at the side of the stationary die, means to cause nails to be presented one by one by gravity at the end of the stationary die in position to be advanced and rolled between the dies through engagement of the movable die with the nail, a die carrier for the movable die, and means for operating the carrier to cause the nail to traverse completely the face of one of the dies during movement of said movable die in one direction.

13. A machine of the class described having, in combination, a pair of coöperating dies one of which is stationary and the other arranged for movement back and forth at the side of the stationary die, a raceway for conducting nails to one end of the stationary die into position to be received between the dies, a separator for the nails in the raceway arranged to permit the end nail of the series to advance into position to be rolled between the dies when the movable die is in a predetermined position, and means movable with said movable die for operating the separator.

14. A machine of the class described having, in combination, a pair of coöperating dies one of which is stationary and the other arranged for movement back and forth at the side of the stationary die, a carrier for the movable die, means for operating the carrier, a raceway for conducting nails to one end of the stationary die, a separator normally positioned to retain the nails in the raceway, a stop on the die carrier arranged to assume a position opposite to the end of the raceway when the carrier is at the limit of its movement in one direction, and means on the carrier for operating the separator to permit the end nail of the series to move into engagement with the stop when the carrier is at said limit of movement.

15. A machine of the class described having, in combination, a pair of coöperating dies one of which is stationary and the other arranged for movement back and forth at the side of the stationary die, a carrier for the movable die, means for operating the carrier, a raceway for conducting nails to one end of the stationary die, a separator normally positioned to retain the nails in the raceway, a stop on the die carrier arranged beyond the end of the movable die to assume a position opposite to the end of the raceway when the carrier is at its limit of movement in one direction, said stop being so positioned with reference to the stationary die as to retain a nail in position to be advanced between the dies through movement of the movable die, means on the die carrier for operating the separator to release the end nail of the series when the stop is opposite

to the end of the raceway, and means for returning the separator to its normal position before said nail has started to roll between the dies.

16. A machine of the class described having, in combination, a pair of coöperating dies one of which is movable back and forth at the side of the other die for rolling nails between the dies, said dies having scores in their opposite working faces for corrugating the nails as they are rolled, a carrier for said movable die, means for operating the carrier, means for presenting nails one by one in position to be rolled between the dies, means on the die carrier for engaging each nail to maintain it in substantially perpendicular relation to the scores in the dies at the beginning of its rolling movement, and means for subsequently withdrawing said engaging means from the nail.

17. A machine for corrugating nails adjacent to their head ends having, in combination, a pair of coöperating dies one of which is movable back and forth at the side of the other die for rolling the nails between the dies, said dies having scores extending longitudinally on their opposite working faces for corrugating the nails, a carrier for the movable die, means for operating the carrier, means for presenting nails one by one in position to be received between the dies, means on the die carrier for engaging the shank of each nail to maintain the nail in substantially perpendicular relation to the scores in the dies, said engaging means being movable relatively to the die carrier, and a cam arranged to withdraw said means from the path of movement of the nail after the nail has traversed a portion of the working faces of the dies.

18. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to cause a nail to roll between them, said dies having their working faces formed for corrugating transversely that portion of the nail between the collar and the head end as the nail is rolled, the dies having also on their working faces means for simultaneously beveling the edge of the nail at its head end, and means for operating the dies.

19. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to cause a nail to roll between them, said dies having their working faces formed for corrugating that portion of the nail between the collar and the head end and for beveling the edge of the nail at the head end as the nail is rolled, means for operating the dies, and means for controlling the longitudinal position of the nail to maintain the nail in position for effective treatment by the dies.

20. A machine for operating upon collar nails having, in combination, means for rolling a nail to shape it between its collar and its head end, and means for engaging the collar of the nail to present the nail in proper position to be operated upon by said rolling means.

21. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to cause a nail to roll between them, said dies having in their working faces scores arranged for corrugating the nail between its collar and its head end as the nail is rolled, and means for engaging the collar of the nail to maintain the nail in proper position for treatment by the dies.

22. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to cause a nail to roll between them, said dies having working faces formed for shaping the nail between its collar and its head end as the nail is rolled, and means for engaging the collar of the nail to maintain the nail in proper position for treatment by the dies, said collar engaging means being arranged for yielding movement to permit endwise expansion of that portion of the nail which is operated upon by the dies.

23. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to roll a nail between them, said dies having in their working faces scores arranged for corrugating the nail between its collar and its head end as the nail is rolled, and means below the scores of one of the dies for engaging the collar of the nail to support the nail at the beginning of its rolling movement, said support terminating at an intermediate point in the path of movement of the nail over said die.

24. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to roll a nail between them, said dies having working faces formed for corrugating the nail between the collar and the head end as the nail is rolled, and means below the working portion of one of the dies for engaging the collar of the nail to support the nail for treatment by the dies, said supporting means being arranged to yield to the pressure of said collar during the endwise expansion of that portion of the nail which is operated upon by the dies.

25. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to roll a nail between them, said dies having working faces formed for corrugating the nail between the collar and the head end as the nail is rolled, a nail support pivoted at one end below one of said dies in spaced relation to the die to permit the collar of the nail to enter between the support and the die, and a spring

arranged to swing said support toward the die and to permit it to yield as the nail advances toward the discharge end of the die.

26. A machine of the class described having, in combination, a pair of coöperating dies arranged for relative reciprocatory movement to roll nails between their opposite working faces, said dies having scores in their working faces for corrugating the nails, and means operative at each relative reciprocation of the dies for removing foreign matter from the working portion of one of the dies.

27. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to roll a nail between them, said dies having working faces formed for shaping the nail between the collar and the head end as the nail is rolled, a bar extending longitudinally of one of the dies in position to engage the lower surface of the collar of the nail to position the nail during its rolling movement, and resilient means for positioning said bar to permit the bar to yield under longitudinal expansion of the head portion of the nail.

28. A machine for operating upon collar nails having, in combination, a pair of dies relatively movable to roll a nail between them, said dies having working faces formed for shaping the nail between the collar and the head end as the nail is rolled, and guides extending longitudinally of the dies in position to engage the lower surface of the collar on opposite sides of the nail to position the nail for the action of the dies, one of said guides terminating at an intermediate point in the length of the dies and formed to present a rigid abutment for engagement with the collar of the nail, and the other guide being mounted for yielding movement under longitudinal expansion of the head portion of the nail.

In testimony whereof I have signed my name to this specification.

CHARLES PERKINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."