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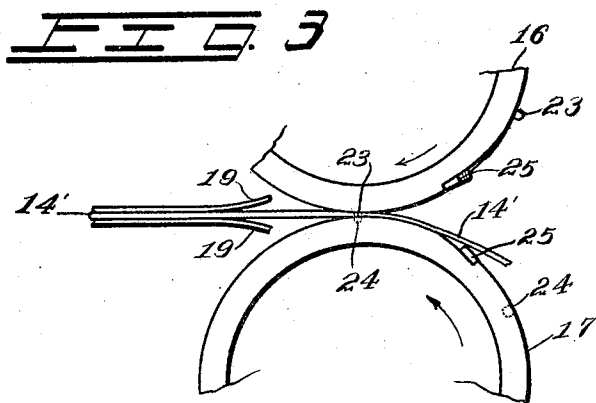
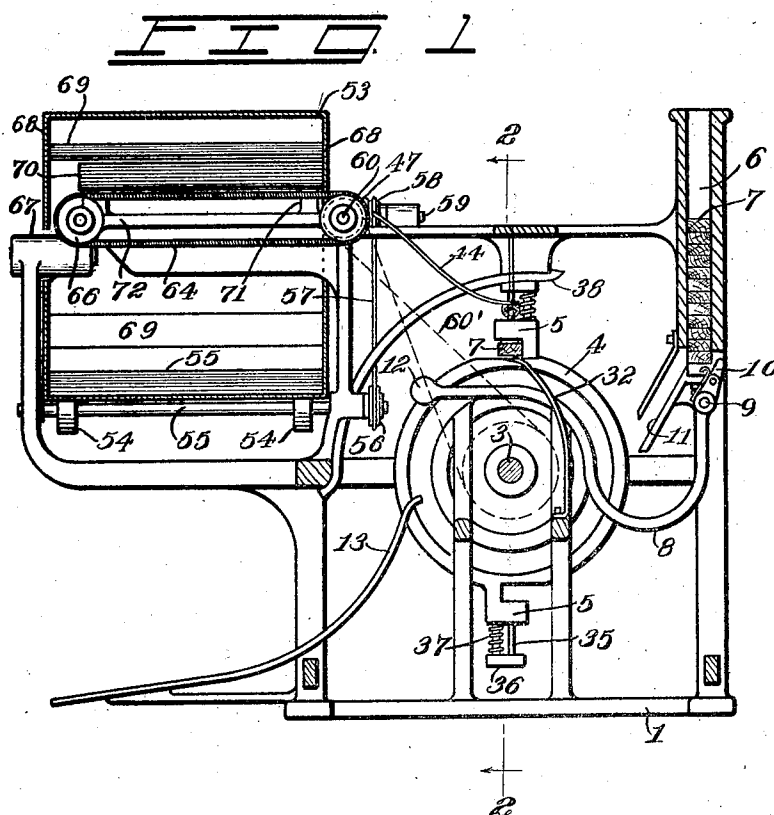
G. PARKS

1,484,150

MACHINE FOR NAILING METAL STRAPS TO WOODEN SLATS

Filed July 29, 1922

2 Sheets-Sheet 1



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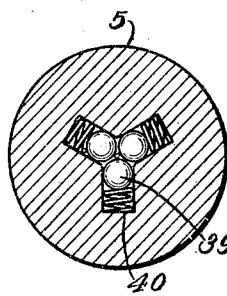
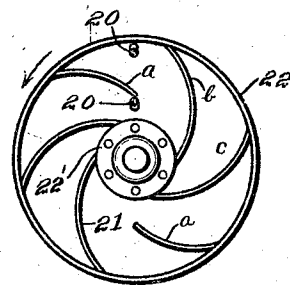
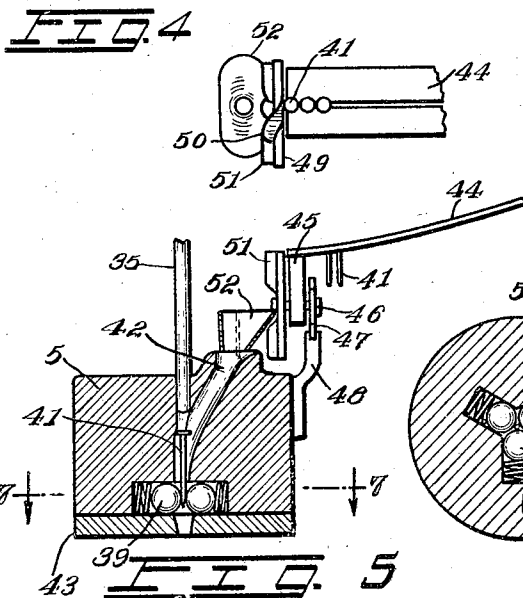
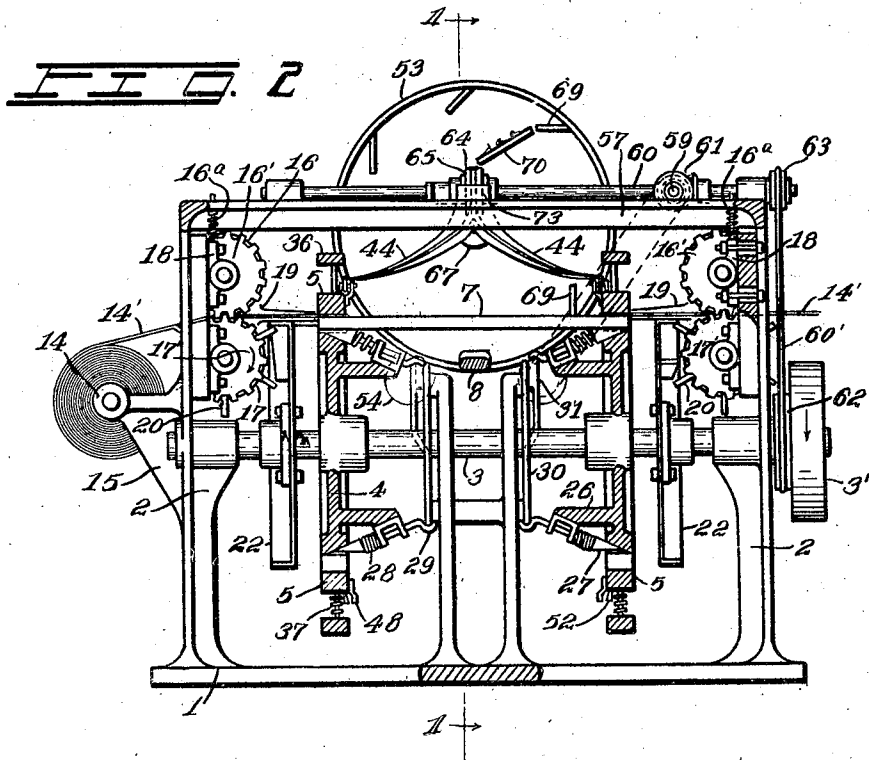


**FIG. 6**

**FIG. 7**

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## UNITED STATES PATENT OFFICE.

GLEN PARKS, OF SEATTLE, WASHINGTON, ASSIGNOR OF ONE-HALF TO HOBART FLYNN, OF SEATTLE, WASHINGTON.

## MACHINE FOR NAILING METAL STRAPS TO WOODEN SLATS.

Application filed July 29, 1922. Serial No. 578,413.

*To all whom it may concern:*

Be it known that I, GLEN PARKS, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Machines for Nailing Metal Straps to Wooden Slats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for nailing metal straps to wooden slats, and particularly to a machine for nailing a short section of strap metal to each end of a wooden slat, to be used in fastening together bunches or roof shingles.

In ordinary commercial handling of house shingles, they are packed into bunches of approximately two hundred and fifty each, and held together by wooden slats and straps. In so packing the shingles, one of the slats is provided before-hand with metal straps. The shingles are then packed over the said slat and then the other slat is laid across the top side of the bunch and the free ends of the metal straps nailed to the top slat.

It is an object of this invention to provide a machine for providing one of the said slats with metal straps.

A further object is to provide a machine in which the feeding of the wooden slats through the machine, the feeding of the metal straps to the ends of the slat, the feeding of nails to the ends of the slats, and the driving of the nails through the metal straps and ends of the slats shall occur automatically.

The above and other objects of the invention will appear from the detailed description of the invention taken in connection with the accompanying drawings forming part of the specification, the novel combination of parts being set forth in the appended claims.

In the drawings—

Figure 1 is an irregular vertical section taken substantially along line 1—1 of Fig. 2;

Fig. 2 is an irregular vertical section taken substantially along line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary detail of the rollers for feeding the metal strap or ribbon and for performing other functions;

Fig. 4 is a fragmentary plan view showing how nails are fed to the nailing apparatus;

Fig. 5 is an enlarged sectional view through a jaw which mounts the nailing mechanism;

Fig. 6 is a side elevation of a cam wheel constituting one of the elements of the machine, and

Fig. 7 is a section on line 7—7 of Fig. 5.

In the drawings, 1 is a frame having standards 2 in which is mounted a horizontally disposed shaft 3 having at one end a pulley 3' by which the shaft may be rotated from a suitable source of power. Fixed to the shaft and arranged in spaced relation thereon are annular slat-carriers 4. Each carrier has a hook-like jaw 5 so disposed that a slat may be supported across said carriers parallel to the shaft 3. A pair of jaws 5 is provided on each carrier.

6 indicates a magazine into which slats 7 are horizontally disposed. These slats are adapted to be fed into the carrier-jaws 5 at appropriate times by mechanism comprising a lever 8 disposed midway said carriers and pivoted as at 9 below the magazine or receptacle 6, the lever having a finger 10 which is adapted to engage behind the bottom slat to push it out of the receptacle, the slat then sliding down the inclined way 11 into position to be picked up by the jaws 5 as the carriers turn. The other end of the lever 8 has a knob 12 which is adapted to be wiped by the slat already in place on the carriers as the slat is being carried along to discharge position. 13 indicates the way down which the slat moves as it is discharged from the carrier jaws. It will now be understood that wiping of the knob 12 causes the lever to be rocked on its pivot 9 and hence the finger 10 will engage a slat to dislodge it from the slat receptacle. When a slat has been carried to upright position as

shown in Figs. 1 and 2, metal ribbons or straps are secured to the ends thereof by mechanism now to be described.

The metal ribbon is contained on a spool, there being a pair of spools which are so disposed as to feed the ribbon toward the ends of the slat. In Fig. 2 is shown one of such spools 14 supported on a bracket 15 projecting from the frame, the leads from the spool being identified as 14' at both sides of the machine. These leads are drawn from their spools by rollers 16, 17 (Fig. 3) which are geared together by gears 16' and 17' at their adjacent ends. The upper roller 16 is yieldingly held to the lower roller 17 as by springs 16", it being understood that the shaft of said roller 16 is mounted in movable bearing blocks 18 on which said springs act. As the ribbon is drawn through its rollers it enters a guideway 19 from whence it discharges across the slat-carrying jaw 5 over the end of the slat therein, (see Fig. 2) ready to be nailed thereto by mechanism hereinafter described.

The means for driving the ribbon-feeding rollers 16, 17 will now be described. Extending radially from the lower roller is a plurality of fingers 20 (six in the present instance) which are adapted to be wiped by a plurality of cam elements 21 secured to the side of a disk 22 affixed to the shaft 3. These cam elements are curved members which extend from the periphery toward the hub 22' of the wheel 22. By reference to Fig. 6, it will be seen that six cam elements are provided. Two of these cams, namely, elements *a* terminate short of the hub 22' and consequently the contacting finger 20 of roller 17 is not carried down as far as the case when wiped by cams *b* or *c* for example. This arrangement provides a period of rest of the rollers which lasts until the next finger is engaged by the next cam *b* (see Fig. 2). During said period of rest the ribbon is stationary and is being nailed to the slat 7. There are two periods of rest during one revolution of the shaft 3 corresponding to the two jaws 5 on the carriers 4.

Inasmuch as the ribbon is a continuous member, suitable lengths of ribbon must be severed from the spool. This is effected by cutting means on the feed rollers 16 and 17, see Fig. 3. Means for punching nail holes in the ribbon is also provided and will be first described. The upper roller 16 carries a radial punch 23 which is adapted to enter a socket 24 on the roller 17. The punch therefore, passes through the ribbon, thus providing a nail hole. A pair of spaced punches are provided and between them is located means for severing the ribbon. It follows, therefore, that both ends of the severed ribbon or strap, as it may conveniently be called, is perforated at both

ends, i. e., not only the end which is nailed to the slat by the machine, but also the other end of the strap which is not so nailed. The ribbon is severed by cooperating shear blades 25 on the rollers, one on each roller. In the present instance, the blades are disposed at an angle to permit the severed ends of the ribbon to be held until further movement of the rollers release the severed portion.

Means are provided for securely holding the slat in position on the carriers 4 during the nailing operation. Projecting laterally from one side of the carrier is a pair of brackets 26, one adjacent each jaw 5. Each bracket mounts a sliding wedge 27. A spring 28 tends to force the wedge into the pocket or jaw 5. The wedge has a stem which terminates in a hook 29. This hook engages with an endless guide or cam 30 disposed around the shaft 3. This guide is dish-shaped as at 31 toward the adjacent carrier 4 above the shaft 3. The construction of the guide is therefore such as to hold the wedge away from the jaw 5 except when the jaw is substantially over the shaft or, in other words, during the operation of nailing the strap to the slat, and for a period following such operation or until the slat has been carried to discharge position. The wedge face has a fluted or dish-shaped face (not shown) to deflect the nails passing through the slot and consequently to clinch the nails. Prior to the wedges passing under the ends of the slat, the latter is lifted by a spring arm 32 disposed adjacent each carrier.

The means for driving the nails through the slat and ribbon will next be described. Each jaw 5 carries a plunger rod 35 having a shoe 36 at its outer end. A guide rod and spring 37 serve to maintain the plunger away from the pocket of the jaw. The plunger is moved toward or into the jaw pocket to perform the nailing operation by a cam bar 38 suitably secured to the frame 1, the cam gradually forcing the plunger toward the pocket as the carrier rotates, and thus gradually forcing the nail through the slat.

By reference to Figs. 5 and 7, it will be seen that the jaw 5 is provided with three balls 39 which are pressed toward each other by springs 40. These spring-pressed balls serve to center the nails 41 as they are received by the conduit 42 in the jaw 5. The plunger 35 pressing on the nail causes the latter to force aside the balls as does the plunger in its movement in forcing the nail home. In Fig. 5, the jaw 5 is shown as provided with a plate 43 behind which the balls 39 are confined.

The means for feeding the nails to the jaws 5 will next be described. 44 indicates a chute down which nails slide from a

container hereinafter described. This chute terminates adjacent the path of the jaw 5 at its upper limit of movement and is provided with means for allowing a nail to drop into the conduit 42 at appropriate times. The chute comprises a slotted member of a width to support the heads of the nails which consequently are pendant from said chute. The lower end of the chute has a depending member 45 in which is journaled a shaft 46 having at one end a four-pointed star wheel 47 which is adapted to be contacted by a striker 48 affixed to one side of the jaw 5. The other end of the shaft carries a disk 49 which serves as a nail distributor. One face of this disk is provided with appropriate slots 50 into which a nail is received from the chute 44 as the slot passes the slit in said chute. After a nail has been thus received it slides down a guideway 51 in the disk and drops into a funnel 52 which is carried by the jaw 5. It will be understood that after a nail has been received into the slot 50 in the distributor, further discharge of nails from the chute 44 is prevented by the flat face of the disk cutting off such discharge.

Nails are supplied to the chutes 44 in the following manner. 53 is a drum into which nails are deposited. The drum is supported in any suitable manner as on rollers 54 on a shaft 55. On one end of this shaft is a pulley 56 over which passes a belt 57 which also passes over a pulley 58 fixed on a stub shaft 59 extending transversely to the main shaft 3. Shaft 59 is driven by a shaft 60 through bevel gears 61, said shaft 60 extending across one end of the drum 53 and parallel to the main shaft 3. Shaft 60 is driven from shaft 3 by a crossed belt 60' looped over pulleys 62 and 63 on shafts 3 and 60, respectively.

Extending through drum 53 from end to end thereof is a slit nail-conveying belt 64. This belt is looped over a pulley 65 on shaft 60 and over an idler 66 at the other end of the drum, said idler being supported on a standard 67 which extends into the drum. 68 indicates radial flanges at each end of the drum to prevent the nails from falling out.

Affixed to the drum is a series of inwardly extending shelves 69 which are adapted to pick up nails and dump them on a fixed inclined plate 70 supported within the drum as by standards 71 rising from a horizontal bar 72 supported at one end on standard 67 at the end of the drum. The lower edge of the plate 70 is disposed over the travelling belt 64 so that a nail sliding down said plate may fall on the belt. Inasmuch as the belt is slit some of the nails will be caught and held in a pendant position by their heads. The belt conveys the nails to a receiver 73 which transfers the nails to the chutes 44 (see Fig. 2) down which the nails slide by gravity as will be understood.

The operation of the machine may be briefly described as follows. Assuming that the shaft 3 is being rotated from any suitable source of power and that a slat extends between the two carriers 4 as shown in Figs. 1 and 2, continued rotation of the carriers will cause the slat 7 to wipe the knob 12 on lever 8 causing the same to dislodge the bottom slat 7 in the magazine 6 at the front of the machine, the slat being deposited adjacent the rims of the carriers in position to be picked up by the jaws 5 as the carriers are rotated. The slat, while being acted upon by the nailing mechanism, is held in close relation with the overhang of the jaw 5 by the wedge 27. As the slat is carried along to discharge position, the wedges are withdrawn from engagement with the bottom of the slat by reason of the hooks 29 of the wedges being drawn outwardly by the cam rings 30, thereby leaving the slats free to drop out of the jaws 5 and onto the discharge ways 13. After a slat has been picked up by the rising jaws 5 and has been carried to a position directly above shaft 3 or as shown in Figs. 1 and 2, the metal ribbon 14' is fed or moved beneath the overhang of the jaw 5 and over the slat prior to the movement of the wedge 27 beneath the slat. Before the wedge has come into action the slat has been lifted upwardly against the overhang of the jaw 5 by the spring bar 32 after which the wedge shoots into place by reason of the abrupt dish or lateral step 54 in the cam guide 30. When the jaw 5 is at the top as said the nail distributor 49 is actuated by the striker 48 attached to said jaw to feed a nail into the conduit 42 in said jaw beneath the nailing plunger 35. Continued rotation of the carrier will cause the cam bar 38 to act on the shoe 36 at the outer extremity of the nailing plunger 35 and gradually depress the latter thus causing the plunger to press the nail through the metal strap and slat. The plunger is held in depressed position for substantially a quarter revolution or until the slat is in position to be dropped onto the discharge way 13. The ribbon or strap is perforated as it passes between the feed rollers 16 and 17 and is severed from the spool by the shear blades 25 on said rollers as will be recalled. The feeding of the ribbon or strap toward the carriers is practically continuous until the strap has been projected sufficiently far over the ends of the slat preparatory to being nailed thereto, feeding of the strap being momentarily discontinued while the strap is being nailed to the slat, it being recalled that the cam wheel 22 is designed to permit a pause in the feeding of the ribbon or strap. During rotation of the shaft 3, the drum 53 is continually rotating to elevate nails therein and to discharge the same onto the inclined plate 70 from whence they fall on the upper run of the nail-carrying belt 64, said belt discharging nails into a

receiver 73 from which the nail-carrying chutes 44 diverge toward their respective carriers.

The above described machine enables  
5 straps to be nailed onto the ends of the slats quickly and economically and the operation of the machine is automatic throughout.

What I claim is:

1. In combination, a shaft, a pair of  
10 disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting carriers for slats, means for feeding slats to said carriers, and means carried by said disks for nailing straps fed to the slats.

15 2. In combination, a shaft, a pair of disks affixed thereto, means supported by said disks for receiving and holding slats, means for feeding slats to said holding means, means for feeding straps to slats within said  
20 holding means, and means carried by said disks for nailing the straps to the slats.

3. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting  
25 carriers for slats, means for feeding slats to said carriers, means for feeding straps beneath said jaws, and means for nailing said straps to the slats.

4. The combination as in claim 3, and  
30 means for firmly holding said slats during the nailing operation.

5. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting  
35 carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, means adjacent said disks for feeding metal ribbons over the ends of said slats, nailing means carried  
40 by said jaws, means for feeding nails to said nailing means, and means for operating said nailing means as the carriers rotate.

6. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting  
45 carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, means for feeding metal straps over the ends of said slats, means forcing the ends of said slats and  
50 overlying straps against the jaws, a plunger carried by each jaw, means for feeding nails beneath said plungers, and means for moving said plungers toward the slats to force  
55 the nails through said straps and slats.

7. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting  
60 carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, brackets projecting from said disks adjacent said jaws, sliding wedges carried by said brackets, means normally maintaining said wedges away  
65 from the pockets of said jaws, and means

permitting said wedges to move into said pockets after a slat is in place therein.

8. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting  
70 carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, brackets carried by said disks adjacent said jaws, wedges carried by said brackets, means to project said  
75 wedges into the pockets formed by said jaws, an annular cam guide, and means on said wedges in engagement with said cam guide, said cam guides having an abrupt  
80 step at one portion thereof to permit said wedges to shoot into said pockets under the action of the projecting means.

9. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting  
85 carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, a slat magazine at one side of said shaft, and means for ejecting a  
90 slat from the bottom of said magazine in position to be picked up by said jaws, said means being operated by a slat already in the carrier prior to the discharge of said  
slat therefrom.

10. In combination, a shaft, a pair of  
95 disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, a cam  
100 wheel adjacent each disk, and ribbon feeding mechanisms actuated by said cam wheels.

11. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery  
105 of said disks, said disks and jaws constituting carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, a cam wheel adjacent each disk, a pair of vertically  
110 disposed rollers adapted to receive metal ribbon between them adjacent each disk, and means on one of said pair of rollers operated upon by each of said cam wheels for causing said  
rollers to rotate.

12. In combination, a shaft, a pair of  
115 disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, a ribbon guid-  
120 ing member at one side of the path of each of said jaws, means for feeding ribbons into said guides and into the pockets of said jaws over the slat contained therein, and means interrupting the feeding of said  
125 ribbons after the ends of the same have been disposed over said slat.

13. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery  
130 of said disks, said disks and jaws constitut-

ing carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, a ribbon guiding member at one side of the path of each of said jaws, a pair of vertically disposed rollers adjacent one end of each of said ribbon guiding members, a spool of ribbon at one side of each of said rollers, cam wheels affixed to said shaft adjacent each of said disks, and fingers projecting from one of said pair of rollers, said fingers adapted to be wiped by said cam wheels to rotate said rollers, whereby to feed said ribbons into said ribbon guiding members.

14. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, a nail feeding means including chutes terminating adjacent the path of movement of said jaws, a conduit in each of said jaws, means operated by the passage of said jaws past the terminals of said chutes for allowing nails to pass from said chutes to said conduits, plungers carried by said jaws, and means for forcing said plungers against the nails received in said conduits to drive said nails through the ends of the slat held by said jaws.

15. In combination, a horizontally disposed drum for holding nails, a pair of chutes from said drum down which said nails slide by gravity, a shaft disposed transversely below said drum, a pair of

disks affixed to said shaft, jaws on the periphery of said disks, said chutes terminating at one side of the path of said jaws, a nail-receiving conduit in each of said jaws, means operated by the passage of said jaws past the terminal of said chutes to transfer nails from said chutes to said conduits, and means for forcing said nails out of said conduits.

16. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, a slat receptacle at one side of said shaft, and a lever pivoted below said receptacle, one arm of said lever being disposed at one side of the bottom of said receptacle, the other arm of said lever extending over the shaft and beyond the periphery of said disks whereby said last mentioned arm is wiped by a slat carried by said disks.

17. In combination, a shaft, a pair of disks affixed thereto, jaws on the periphery of said disks, said disks and jaws constituting carriers for slats, said slats being adapted to be disposed across said carriers in parallel relation to said shaft, and a spring arm disposed adjacent each of said disks, said arm extending to the periphery of said disks, whereby as a slat is carried up by said jaws it will contact with said spring arm and be moved outwardly against one face of said jaw.

In testimony whereof I affix my signature.

GLEN PARKS.