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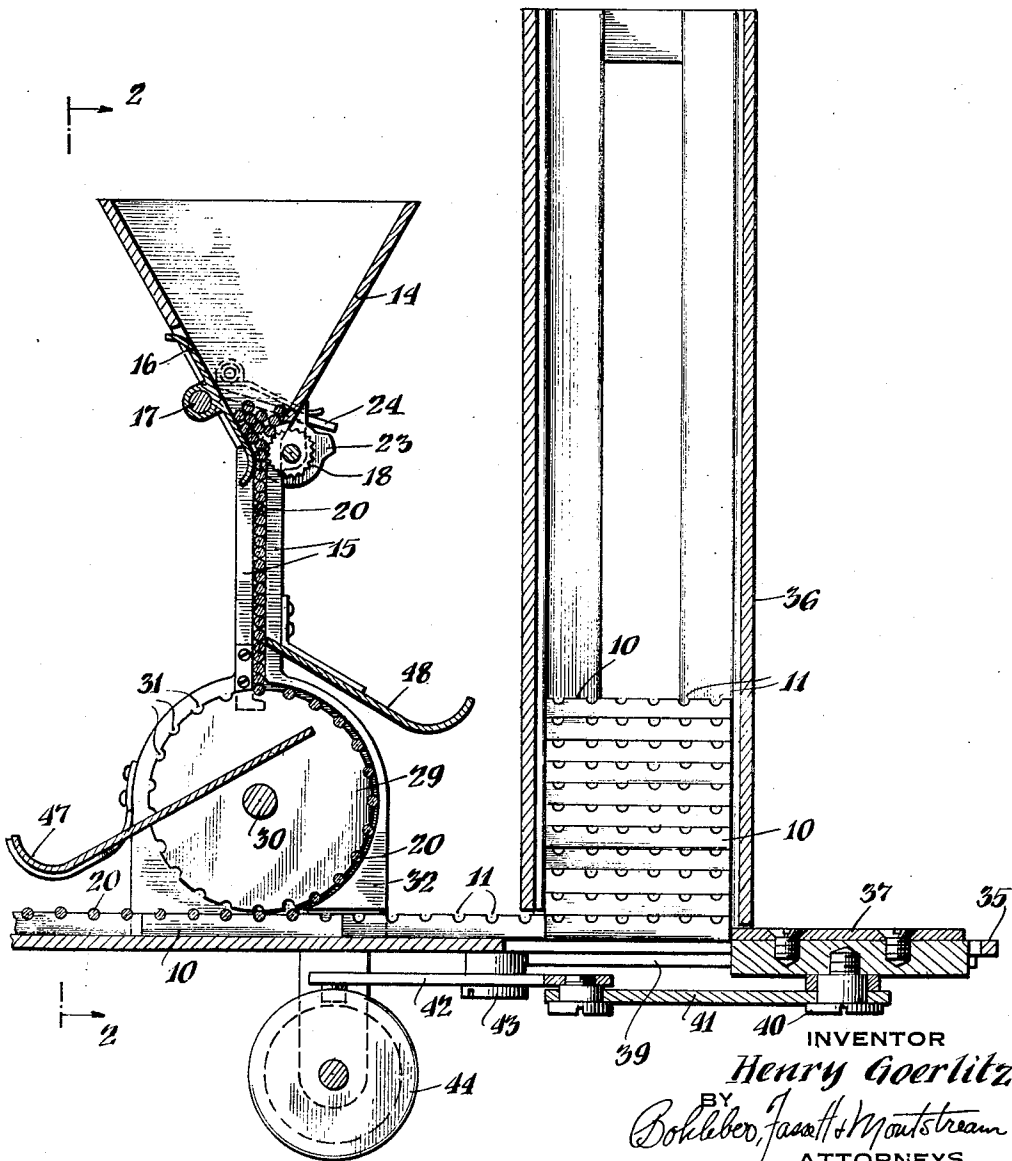
2,613,861

ROD FEEDING MACHINE WITH ROD RECEIVING GROOVED
MEMBER MOVABLE TO ACTUATE ROD FEEDING MEANS

Filed April 6, 1946

3 Sheets-Sheet 1

Fig. 1



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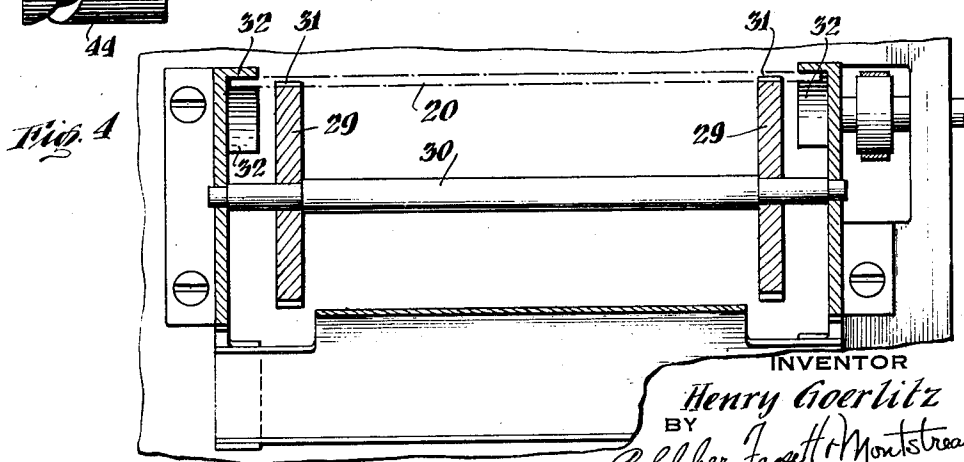
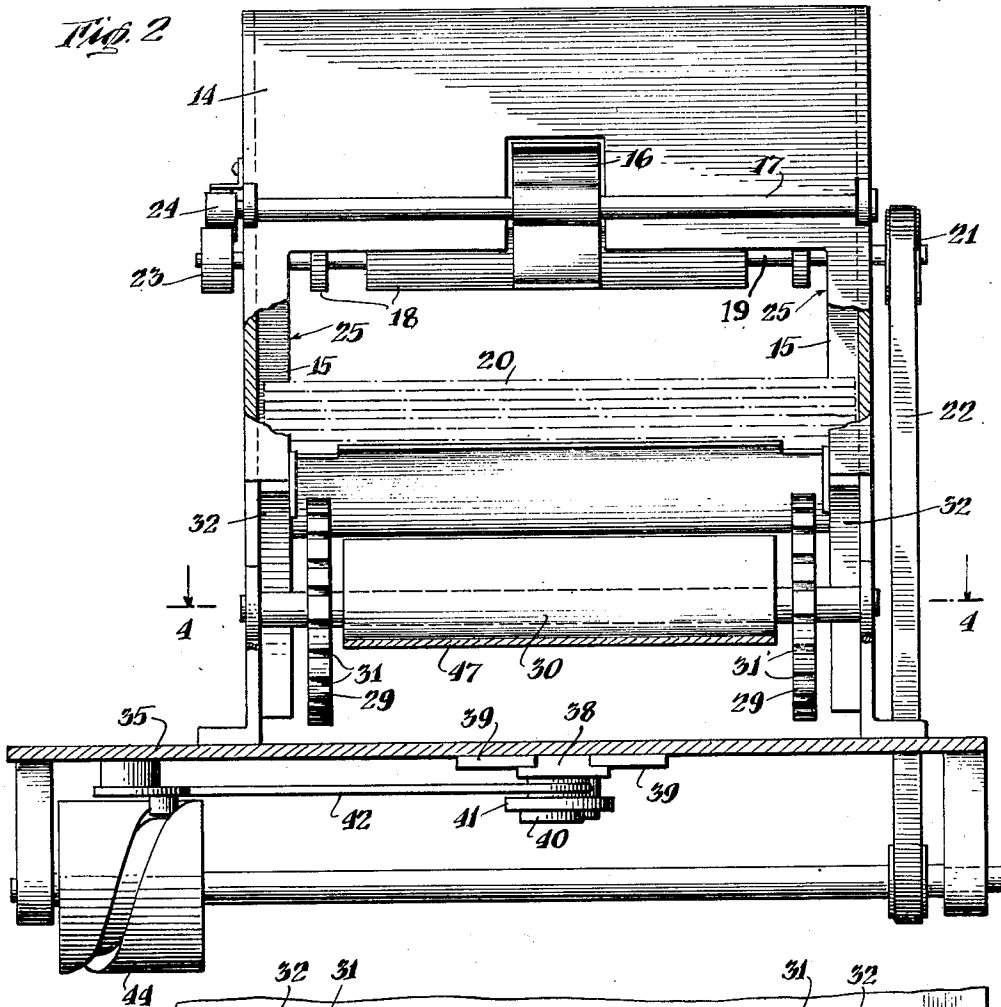
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 3

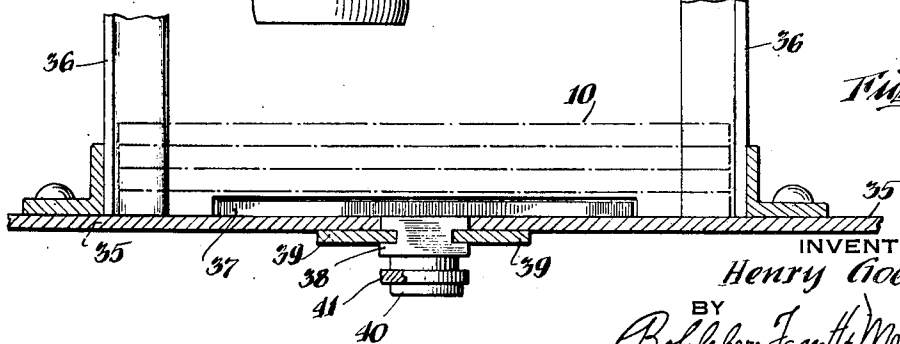
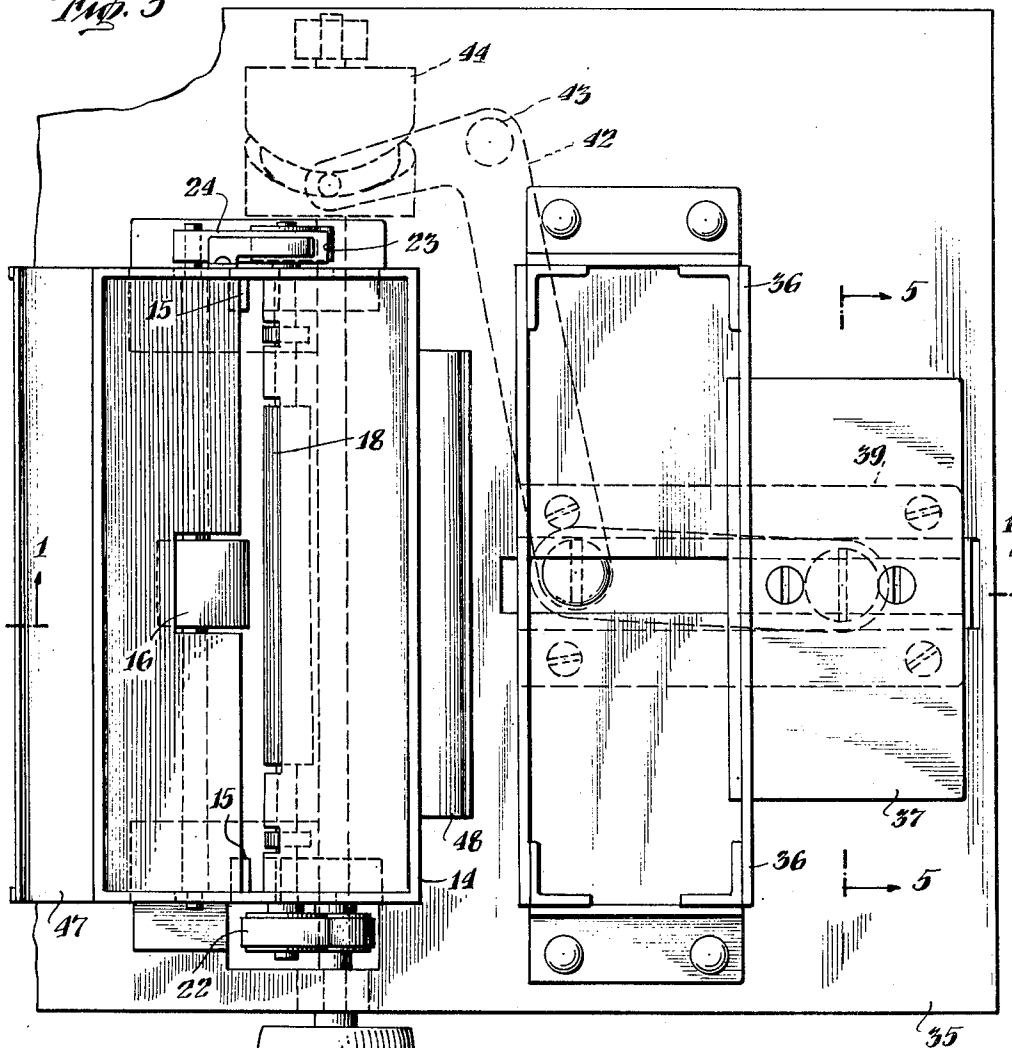


Fig. 5

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ROD FEEDING MACHINE WITH ROD RECEIVING GROOVED MEMBER MOVABLE TO ACTUATE ROD FEEDING MEANS

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14 Claims. (Cl. 226—2)

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The invention relates to a machine for feeding rods into spaced grooves in a part to receive the same. The machine relates particularly to the feeding of lead rods for pencils into the spaced grooves in slats which lead loaded slats are assembled and glued with a like slat to form pencil blanks.

In the making of pencils wood slats are made with spaced parallel grooves therein to receive lead rods. A pencil lead rod is fed into each groove of the slat, after which a like grooved slat having its grooved face coated with glue is positioned thereover and clamped together until the glue is dried. The slats may vary in width and carry anywhere from three to nine grooves although the number of grooves is immaterial and depends only upon the slat width. The glued blanks are then slit lengthwise and shaped to form separate pencils, each with a lead rod in the center thereof. The separated pencils may then be painted or otherwise finished as a saleable article.

It is an object of the invention to construct a new and novel rod feeding machine for feeding rods to a member having spaced grooves in the surface thereof.

Another object of the invention is to construct a rod feeding means for laying a rod in each spaced groove carried by a grooved member or slat in which the grooved members are fed into the rod feeding machine and a driving connection between the rod feeding means and the grooved member is established by the rod itself.

A still further object of the invention is to provide a method of feeding rods into spaced grooves in another member such as a slat or the like in which the rod feeding means is freely rotatable and a driving connection between the grooved member or slat and the freely rotatable feeding means is established through the rod itself engaging within a groove of the feeding means and a groove of the moving member.

Other objects of the invention will be apparent from the following description when taken in connection with the accompanying drawings illustrating the construction in which:

Figure 1 is a sectional view through the feeding machine.

Figure 2 is a front view partly in section through the machine taken on line 2—2 of Figure 1.

Figure 3 is a plan view of the machine.

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

Figure 5 is a sectional view taken on line 5—5 of Figure 3.

The machine to be described herein is designed particularly to feed lead rods to slats 10, having spaced grooves 11 therein each of which slats is glued to a corresponding slat to form a pencil

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blank. The blanks are thereafter slit apart and shaped to form individual pencils. The machine however, is suitable for feeding rods of any form to grooved members or parts and is not limited to lead pencil rods and pencil slats.

The machine includes a hopper 14 having guideways 15 extending from the bottom thereof. The hopper may have an oscillating plate 16 mounted upon a shaft 17 for oscillating the plate. On the opposite side of the guideway or hopper from the oscillating plate 16 is a roller 18 mounted upon a shaft 19 which is rotated in a direction tending to move the lead rods upwardly. The mechanism described is intended to feed lead rods 20 into the guideway one at a time.

A suitable driving connection may be used to rotate the roller 18 and to oscillate the oscillating plate 16. The means particularly shown includes a pulley 21 carried by the shaft 19, which pulley is driven from a belt 22. The oscillated plate 16 may be oscillated by a cam 23 carried upon the shaft 19, which cam engages a lever 24 connected with a shaft 17 to oscillate the shaft for the oscillating plate. The guideway 15 has a large opening or window 25 so that broken lead rods are removed from or fall out of the guideway. The hopper, guideway and associated mechanism provide means to lay or feed rods in the grooves of the grooved feeding means or wheel.

At the end or bottom of the guideway 15 is a grooved rod feeding or loading means which spaces the rods and feeds them to the grooved members or slats. Preferably the rod feeding means comprises a pair of spaced wheels 29 mounted in horizontal position upon a shaft 30. The spaced wheels 29 are in effect one feeding wheel. The wheels 29 have uniformly spaced grooves 31 in the periphery thereof and spaced apart a distance approximating, or the same as, the spacing of the grooves 11 in the slats. The rod grooves are less than the diameter or cross sectional dimension of the rod so that the latter projects above the periphery of the rod feeding means or wheels. The rod feeding wheels 29 are freely rotatable in that there is no driving connection between the same and the rest of the mechanism. The feeding wheels are turned or rotated in a manner which will be described hereinafter. Means are provided to retain the lead rods 20 in the grooves upon the periphery of the wheels 29. This means may be a guide 32 extending around a semi-circumference of the rod feeding wheels. The grooved wheels, therefore, provide means for feeding the lead rods in spaced relation to the slats or grooved members.

The slats 10 are fed adjacent to the rod feeding means or wheels 29 and preferably underneath the wheels and upon a table or plate 35. Any suitable means may be used to feed the slats

to the feeding wheels the slat feeding means shown being a reciprocating type. The slats are loaded in a slat hopper 36 and are fed from the bottom thereof by a pusher plate 37 which carries a slide plate 38 having grooves within which are received the slideways or guides 39. The slide plate 38 carries a pivot pin 40 which receives a connecting link 41, the end of which is connected with a bell crank lever 42 pivoted upon a pin 43. The end of the bell crank lever is oscillated by a cam 44 which is connected with suitable drive means so that the bell crank 42 oscillates and thereby reciprocates the pusher plate 37. At the remote or retracted position of the pusher plate, a slat drops down in front thereof from the slat hopper and the pusher plate engages a side face thereof to eject the same from the hopper. Each slat engages the side edge of the preceding slat so that the slats are fed underneath the rod feeding means in succession. It is clear that a continuous slat feeding means may be used if desired, however, with the rod feeding means being controlled or driven from the slats themselves, a reciprocating slat feeding means with its discontinuous feeding of the slats, may be used.

The machine is operated in a manner now to be described. The rod hopper is filled with lead rods 20 which drop down through the guideway 15 until they contact the feeding wheels 29. The feeding wheels are initially rotated by hand, and a lead rod drops into each groove 31 as it passes beneath the guideway until a lead is ready to drop from the end of the guide 32. Slat is now fed underneath the feeding wheels and a lead drops into the first groove 11 in the slat. The lead rod is therefore engaging both in the groove in the slat and the peripheral groove 31 in the feeding wheel. The slats are projected to the left as viewed in Figure 1 by the slat feeding means so that the lead rod forms in effect a gear tooth or driving connection between the slat and the rod feeding means to move the same to the next rod feeding position or groove, the movement for feeding wheels being rotation of the latter. This interengagement of the lead rod between the slat or grooved member and the feeding wheels rotate the latter far enough so that a second lead rod drops into the next slat groove 11 so that this lead rod takes up the driving interengagement and continues the rotation of the feeding wheel means. Preferably the diameter of the feeding wheels is such that a driving connection effected by the lead rod occurs for a distance approximating the spacing between grooves, that is, when a lead rod drops into a groove in the slat at or adjacent the end of the guide 32, driving interengagement is established and continues until, the leading edge of the groove 31 rises above the lead rod because of the rising groove in the periphery of the rotating wheel means.

The advantage of rotating the feeding wheel by the lead rods themselves will be pointed out. The grooves 11 in each slat are uniformly spaced with respect to each other. The spacing between the grooves at each edge and the edge of the slat is greater however than one half the spacing between adjacent grooves in each slat. This increased spacing at the edges is provided so that the edge may be cleaned off and smoothed in the slitting operation upon the pencil blanks. If the feeding wheels 29 had a positive driving mechanism it would be imperative therefore that the grooves on the periphery of the feeding

wheels be spaced corresponding to the increased spacing between grooves on adjacent slats and also means that the feed wheel must be driven in synchronism with the feeding of the slats. Since accurate slat dimensions are difficult to secure in production manufacturing, any variation in the groove to groove dimension between the last groove of one slat and the first groove of the next slat would introduce complications from unequal groove spacing between the slats and the rod feeding means.

With the construction described herein in which the feeding wheels are freely rotatable and are driven from the slats themselves through the agency of the lead rods engaging in the groove on the slat and on the periphery of the feeding wheels, the latter automatically adjusts itself to any unequal spacing between the end grooves of adjacent slats. In other words, when an unequally spaced groove approaches the loading point the lead rod balances on the corner for a moment and then drops into the groove. Apparently as one groove passes diametrical center of the feeding wheel the forward point of the wheel groove drops back relatively to the point of contact with the lead since this point moves upwardly on the circumference of the rod. This automatically adjusts for the different slat groove spacing and the lead drops into its groove. Also if a lead rod happens not to be in a groove, the driving of the wheel continues nevertheless because the driving relation exists for the space of or approximately for the space of two leads. The diameter of the feeding wheel determines the period of engagement between the rods and the feeding wheel.

This construction simplifies materially the machine required to feed lead rods into grooves in the slats, assures proper lead feeding irrespective of varying slat dimensions, and permits reciprocating or discontinuous feeding of the slats. Since no drive mechanism need be provided for the feeding wheels, the grooves in the peripheral feeding wheels do not have to be carefully spaced from each other in order to provide for the greater spacing between end or edge grooves of adjacent slats.

Sometimes a lead rod will break in the guideway and does not fall out of the window 25. In such case the rod falls out at the bottom of the guideway. A guard 47 is therefore provided which extends between the feeding wheels 29 which catches such broken lead rods from the guideway and from the feeding wheels and prevents them from falling upon the moving slats 10. A similar guard 48 may be provided for leads which may fall out of the window 25 in the guideway.

The slats with the lead rods in the grooves are glued to a like slat to form the pencil blanks. These blanks are then cut or slit lengthwise to divide each pencil from the blank.

The invention is presented to fill a need for improvement in a rod feeding machine. It is understood that various modifications in structure, as well as changes in mode of operation, assembly, and manner of use, may and often do occur to those skilled in the art, especially after benefiting from the teachings of an invention. Hence, it will be understood that this disclosure is illustrative of preferred means of embodying the invention in useful form by explaining the construction, operation and advantages thereof.

What is claimed is:

1. A loading machine to feed rods into spaced

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grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising grooved feeding means having spaced grooves each of which is adapted to receive a rod, means mounting the grooved feeding means for free movement and the sole driving connection for the grooved feeding means being a rod in a groove of a grooved member interengaging a groove in the grooved feeding means, means to retain the rods in the grooves as the grooved feeding means moves, means to place rods in the grooves in the grooved feeding means, and means to feed grooved members in the direction of movement of the grooved feeding means and adjacent to the grooved feeding means with the grooved face of the grooved member having a spacing from the grooved feeding means less than the projecting portion of the rod, each of said members being adapted to receive a rod in a groove therein and the freely movable grooved feeding means being moved from a groove in the grooved members as the latter are moved adjacent to the grooved feeding means.

2. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member comprising feeding means having spaced grooves each of which receives a rod and has a depth to retain the same above the face of the feeding means, means mounting the feeding means for free movement, means to retain the rods in the grooves as the feeding means moves, means to feed rods to the grooves in the feeding means, means to feed grooved members in the direction of movement of the feeding means and adjacent to the feeding means, and a rod moving into each groove in the member forming a driving connection between the grooved member and the feeding means to move the freely movable feeding means by the grooved members as they are moved adjacent thereto.

3. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising loading wheel means having spaced grooves in the periphery thereof each of which is adapted to receive a rod, means mounting the loading wheel means for free rotation and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, means to retain the rods in the grooves as the loading wheel means rotates, means to feed rods to the grooves in the loading wheel means, and means to feed grooved slats in the direction of rotation of the loading wheel means and adjacent to the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each of said slats being adapted to receive a rod into each groove therein to form a driving connection between the freely rotatable loading wheel means and the moving slats as they are moved adjacent to the loading wheel means.

4. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising horizontal loading wheel means having grooves in the periphery thereof uniformly spaced apart a distance corresponding to the

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spacing of the grooves in the slats, each groove is adapted to receive a rod, extending above the periphery of the loading wheel means, means mounting the loading wheel means so that it is freely rotatable and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, means extending to a point adjacent the bottom of the loading wheel means to retain the rods in the grooves as the loading wheel means rotates, means to place rods in the grooves in the loading wheel means, and means to feed grooved slats underneath the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each grooved slat being adapted to receive a rod into each groove therein to form a driving connection between the freely rotatable loading wheel means and the moving slats as they are pushed under the loading wheel means.

5. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising loading wheel means having spaced grooves in the periphery thereof, each groove adapted to receive a rod, means mounting the loading wheel means so that it is freely rotatable and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, means extending to a point adjacent the bottom of the loading wheel means to retain the rods in the grooves as the loading wheel means rotates, means to feed rods to the grooves in the loading wheel means, a slat hopper adjacent the loading wheel means, and reciprocating means to feed grooved slats from the slat hopper underneath and adjacent to the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each grooved slat being adapted to receive a rod into each groove therein to form a driving connection between the freely rotatable loading wheel means and the moving slats as they are pushed under the wheel means.

6. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising loading wheel means including a pair of relatively narrow spaced wheels having grooves in the periphery thereof each of which is adapted to receive a rod and has a depth to retain the rod above the periphery of the loading wheel means, means mounting the loading wheel means so that it is freely rotatable and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, a guard means positioned between the spaced wheels, means extending to a point adjacent the bottom of the loading wheel means to retain the rods in the grooves as the loading wheel means rotates, means to feed rods to the grooves in the loading wheel means, and means to feed grooved slats underneath the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each grooved slat being adapted to receive a rod into each groove therein to form a driving connection to turn the freely rotatable loading wheel means

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by the moving slats as they are pushed under the loading wheel means.

7. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising loading wheel means having uniformly spaced grooves in the periphery thereof each of which is adapted to receive a rod, means mounting the loading wheel means for free rotation and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, means extending to a point adjacent the bottom of the loading wheel means to retain the rods in the grooves as the wheel means rotates, means to feed rods to the grooves in the loading wheel means, means to feed grooved slats underneath the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each grooved slat being adapted to receive a rod into each groove therein to form a driving connection between the freely rotatable loading wheel means and the moving slats as they are pushed under the loading wheel means, and the loading wheel means having a diameter in relation to the spaced grooves and the cross-section of a rod to turn the loading wheel means a distance approximating the spacing between the grooves.

8. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member comprising loading wheel means having uniformly spaced grooves in the periphery thereof each of which is adapted to receive a rod and has a depth to retain the rod above the periphery of the loading wheel means, means mounting the loading wheel means for free rotation and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, means extending to a point adjacent the bottom of the loading wheel means to retain the rods in the grooves as the loading wheel means rotates, means to feed rods to the grooves in the loading wheel means, and reciprocating means to feed grooved slats underneath the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each grooved slat being adapted to receive a rod into each groove therein to form a driving connection between the freely rotatable loading wheel means and the moving slats as they are pushed under the loading wheel means.

9. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising loading wheel means having uniformly spaced grooves in the periphery thereof each of which is adapted to receive a rod and has a depth to retain the rod above the periphery of the loading wheel means, means mounting the loading wheel means for free rotation and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, means extending to a point adjacent the bottom of the loading wheel means to retain the rods in the grooves as the loading wheel means rotates, means to feed rods to the grooves in the loading

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wheel means, a slat hopper in front of the loading wheel means, and reciprocating means to feed grooved slats from the bottom of the hopper underneath the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each grooved slat being adapted to receive a rod into each groove therein to form a driving connection between the freely rotatable loading wheel means and the moving slats as they are pushed under the loading wheel means.

10. A loading machine to feed rods into spaced grooves in a member such as a slat or the like in which the spaced grooves have a depth to retain a rod projecting above the face of the member, comprising loading wheel means having uniformly spaced grooves in the periphery thereof each of which is adapted to receive a rod and has a depth to retain the rod above the periphery of the loading wheel means, means mounting the loading wheel means so that it is freely rotatable and the sole driving connection with the loading wheel means being a rod in a groove of the grooved member interengaging a groove of the loading wheel means, means extending to a point adjacent the bottom of the loading wheel means to retain the rods in the grooves as the loading wheel means rotates, and means to feed rods to the grooves in the loading wheel means including spaced guides having a substantial opening therebetween to permit broken rods to drop out thereof, means to feed grooved slats underneath the loading wheel means with the grooved face of the grooved member having a spacing from the loading wheel means less than the projecting portion of the rod, each grooved slat being adapted to receive a rod into each groove therein to form a driving connection between the freely rotatable loading wheel means and the moving slats as they are pushed under the loading wheel means.

11. A loading machine to feed rods into spaced grooves in a member such as a slat or the like, comprising grooved feeding means having spaced grooves each of which receives a rod and retains the same projecting above the face of the grooved feeding means, means mounting the grooved feeding means for free movement, means to retain the rods in the grooves as the grooved feeding means moves, means to place rods in the grooves in the grooved feeding means, at least one grooved member having at least one groove in the surface thereof of a depth to retain the rod projecting above the surface and adapted to have a rod placed in each groove, means to feed the grooved member adjacent to the grooved feeding means, and a rod moving into each groove in the member forming a driving connection between the grooved member and the grooved feeding means to move the freely movable grooved feeding means by the grooved members as they are moved adjacent thereto.

12. A method of feeding rods into spaced grooves in slats or the like comprising moving the slats in side by side relation, feeding the rods to the spaced grooves in the slats, and driving the rod feeding means by the movement of the slats and the interengagement between the latter and the rod feeding means effected by the rod engaging in a groove in the slat and the rod engaging the rod feeding means.

13. A method of feeding rods into spaced grooves in slats or the like comprising moving the slats in side by side relation, spacing the rods

in grooves spaced corresponding to the spaced grooves in the slat, feeding the rods into the grooves of the slats, and driving the rod feeding means by the movement of the slats and the interengagement between the latter and the rod feeding means effected by a rod engaging in a groove in the slat and a groove in the rod feeding means.

14. A method of feeding rods into spaced grooves in slats or the like comprising moving the slats in side by side relation, spacing the rods in grooves spaced corresponding to the spaced grooves in the slats, feeding the rods into the grooves of the slats, driving the rod feeding means by the movement of the slats and the interengagement between the latter and the rod feeding means effected by the rod engaging in

a groove in the slat and the rod feeding means, and separating the driving interengagement of each rod between the slat and rod driving means after engagement for a distance approximating that of the groove spacing.

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