UNITED STATES PATENT OFFICE.

CHARLES E. MITCHELL, OF DECATUR, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-FOURTH TO HARRY L. NIXON AND ONE-FOURTH TO C. T. PAYTON, BOTH OF ST. LOUIS, MISSOURI.

BOLT-FEEDING MACHINE.

976,483.


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To all whom it may concern:

Be it known that I, CHARLES E. MITCHELL, a citizen of the United States, residing at Decatur, Illinois, have invented certain new and useful Improvements in Bolt-Feeding Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of a bolt feeding machine of my improved construction. Fig. 2 is a plan view of the machine. Fig. 3 is a detail elevation of the means employed for imparting intermittent movement to the endless carriers forming a part of my improved machine. Fig. 4 is an elevation of a portion of one of the chains forming a part of the endless carrier of my improved machine. Fig. 5 is a detail plan view of the means employed for moving the bolts rearwardly, so that their rear ends enter the furnace.

My invention relates to a bolt feeding machine, the object of my invention being to construct a simple inexpensive machine or apparatus which feeds the rods from which the bolts are formed to the furnace for the purpose of heating said rods and then carrying said rods and feeding the same one at a time to the bolt heading machine.

A further object of my invention is to construct a bolt feeding machine which is connected to and operated by the heading machine, thus cooperating with said heading machine and delivering the bolts one at a time, which action corresponds to the movement of the heading machine when the head is formed on the end of the bolt.

To the above purposes my invention consists in certain novel features of construction and arrangement of parts hereinafter more fully described and claimed.

The frame of my improved machine is preferably made in skeleton form, and comprises suitable end supports 1 united by braces 2, and this frame occupies a position immediately to the right of the bolt heading machine (not shown), and immediately in front of the furnace 3, utilized for heating the ends of the rods which are formed into bolts.

The front wall of the furnace is provided with a horizontally disposed slot through which the ends of the lengths of rods extend while the same are being fed to the heading machine. Fixed on each end of the frame are suitable brackets 4, and journaled in the upper ends thereof are the transversely disposed shafts 5.

Fixed on the rear ends of these shafts or the ends immediately adjacent the furnace 3 are sprocket wheels 6, and connecting this pair of sprocket wheels is a sprocket chain 7, each link of which is provided with an upwardly projecting ear or wing 8.

Adjustably positioned on the shafts 5 inside the front pair of brackets 4 is a corresponding pair of sprocket wheels 9, which latter are connected by a sprocket chain 10, which is a counterpart of the sprocket chain 7. The sprocket wheels 9 are adjustable upon the shafts 5 in order that they can be moved backward or forward to accommodate various lengths of bolts.

Fixed on the left hand end of the shafts 5 immediately adjacent the sprocket wheel 6 thereon is a ratchet wheel 11. Journaling in the left hand portion of the frame of the machine immediately below the corresponding shaft 5 is a shaft 12, and fixed thereon is a vertically disposed lever 13, the upper end of this lever is provided with a weighted pawl 14 the point of which engages the teeth of the ratchet wheel 11.

Pivotedly connected to the upper portion of the lever 14 is a horizontally disposed rod or link 15 which is connected to a movable 90 part of the bolt heading machine, this rod or link 15 has a reciprocating movement and with each actuation of the bolt heading machine said rod moves in the direction indicated by the arrow in Fig. 3. Such action swings the upper end of the lever 13 toward
the right hand and the point of the pawl 14 engaging with the ratchet wheel 11 correspondingly imparts intermittent rotary motion to the shaft 5 upon which said ratchet wheel is fixed, thus it will be seen that with the mechanism just described an intermittent movement is imparted to the chains 7 and 10, which carry the bolts through the furnace and to the heading machine, which intermittent movement corresponds to the movement of the heading machine during the action of forming a head on the end of one of the rods.

A hopper 16 for holding the lengths of rods to be formed into bolts is arranged on suitable supports immediately above and to the right of the right hand end of the machine, which hopper is provided with an inclined bottom 17, and the top and front of said hopper being open.

A short vertically disposed chute 18 leads downward from the lower end of the hopper 16 to a point immediately above the right hand end of the bolt carrier, comprising the chains 7 and 10.

Agitating fingers 19 are pivotally mounted on the under side of the bottom of the hopper 16, the upper ends of which fingers project through slots 20 formed in the bottom of said hopper. These fingers are for the purpose of agitating or moving the rods in the hopper 16 to cause the same to automatically feed downward over the inclined bottom to the outlet at the lower end thereof.

Journaled on a shaft 21 in the right hand end of the frame is a bell crank 22 and pivotally connected to the outer end of the horizontal arm thereof are the lower ends of a series of rods 23, the upper ends of which are pivotally connected to the lower ends of the fingers 19. Each of these rods is made in two parts and connecting said parts is a stiff coil spring 24. These springs are for the purpose of permitting the agitating fingers 19 to yield readily when they encounter the weight of a considerable number of rods located in the hopper 16.

The lower end of the vertical arm of the bell crank 22 is pivotally connected to one end of a rod 25, the opposite end of which is pivotally connected to the lower end of the lever 13, thus it will be seen that the agitating fingers are actuated with each movement of the lever 13.

26 designates a plate or table which is suitably supported, and which occupies a position between the upper portions of the sprocket wheels 6 and 9, and the chains 7 and 10 travel over this plate or table in passing from the sprocket wheels at the right hand end of the machine to the corresponding sprocket wheels at the left hand end. This plate or table occupies the same horizontal plane with the lower portion of the horizontal slot formed in the front wall of the furnace.

Journaled in suitable bearings adjacent the right hand end of the machine, and at the front side thereof is a vertically disposed shaft 27, the upper end of which carries a 7 finger 28, the same normally occupying a position on top of and adjacent the front edge of the plate or table 26.

Fixed to the lower end of the shaft 27 is a laterally projecting arm 29, and pivotally connected to the end thereof is one end of a link 30, the opposite end of which is pivotally connected to the end of one of the arms of a horizontally disposed bell crank 31, which is fulcrummed on a bracket 32.

In the center of the frame of the machine and pivotally connected to the end of the opposite arm of this bell crank is an arm or finger 33, which projects forwardly from the connecting rod 25. The mechanism just described provides means whereby the sections of rods are moved rearward so that their rear ends enter the furnace through the slot in the front wall thereof (see Fig. 2).

The operation of my improved bolt feeding machine is as follows: The rod 15 is connected to and operated by a reciprocating part of the bolt heading machine and said rod moves forward and backward with each operation of said heading machine. As said rod 15 moves toward the right hand the pawl 14 carried by the upper end of the lever 13 engages the teeth of the ratchet wheel 11, thus moving said ratchet wheel the distance of one tooth, thereby partially rotating the shaft 5 upon which said ratchet wheel is mounted. The repeated movements of the rod 15 result in an intermittent movement of the endless carrier comprising the chains 7 and 10, and said chains are moved a distance corresponding to the length of one link of said chains. The rods of which the bolts are to be formed are cut to proper length and piled in the hopper 16 and from said hopper the rods pass downward through the chute 18, and drop between the ears or wings 8 formed on the links of the chains. As the lever 13 swings backward and forward the rod 25 connected to the lower end of said lever actuates the bell crank 22, and the rods 23 connected to said bell crank 22 actuate the fingers 19. The upper ends of these fingers project through the bottom of the hopper and as said fingers vibrate the upper ends thereof bear against the rods in the hopper and agitate the same, and as a result said rods will gradually roll down the inclined bottom of the hopper and will finally discharge through the spout 18. As the rod 25 reciprocates an intermittent rocking motion is imparted to the shaft 27 through the connec-
tions 29, 30, 31 and 32, and as a result the finger 28 is vibrated backward and forward on top of the plate 26. This operation moves the rods on the carrier rearward and the rear ends of said rods are moved through the horizontal slot in the front wall of the furnace 3. A high degree of heat is maintained within this furnace, and as the rods are intermittently moved forward over the plate 26 by the endless carrier the rear ends of said rods will become heated to a very high degree which is essential and necessary in the formation of the heads on the bolts. Upon reaching the left hand end of the machine the rods with their rear ends heated to the proper degree pass onto an inclined plate A at the lower end of which is formed a pocket, and from which pocket the rods are removed by an operator who places the heated ends between the head forming dies of the heading machine. As the movement of the endless carrier is intermittent the bolts are fed one at a time onto the plate A and consequently are fed in proper relation to the operation of the heading machine.

A bolt feeding machine of my improved construction is comparatively simple, operates with little power, occupies but little space to one side of the heading machine, and provides simple means whereby the bolts are heated and delivered to the heading machine in proper time relation with the operation of said heading machine.

It will be readily understood that minor changes in the form, size and construction of the various parts of my improved machine can be made and substituted for those herein shown and described without departing from the spirit of my invention.

I claim:

1. In a machine of the class described a table an intermittently moving endless carrier, adapted to receive sections of metal rods to be formed into bolts, and convey the same over the table to a bolt heading machine, a vibrating finger on the table for successively engaging the outer ends of the sections of rods whereby the same are moved lengthwise while on the endless carrier, and means for imparting movement to said finger.

2. In a machine of the class described, an endless conveyor, means whereby the same is intermittently actuated, a hopper at one end of the machine, which hopper receives the sections of metal rods to be formed into bolts, there being an outlet in the bottom of the hopper over one of the conveyers and means projecting through the bottom of the hopper whereby the rods are agitated while in the hopper to cause said rods to gravitate to the discharge end of the hopper.

3. In a machine of the class described an endless carrier for conveying sections of metal rods to be formed into bolts from a hopper, a vibrating finger adapted to successively engage the outer ends of the sections of rods whereby the same are moved lengthwise while on the endless carrier, and means for imparting movement to said finger.

4. In a machine of the class described, the combination with an intermittently moving endless carrier adapted to receive sections of metal rods to be formed into bolts, a vibrating finger adapted to successively engage the ends of the sections of rods for moving the same lengthwise while on the conveyor, and means for imparting movement to said finger.

5. In a machine of the class described, a table, an endless conveyor operating over said table and adapted to receive and carry sections of metal rods to be formed into bolts, a vibrating finger on said table for moving the sections of rods longitudinally while on the conveyor, and means for imparting movement to said finger.

6. In a machine of the class described, the combination with a furnace in the front wall of which is formed an opening, of an endless carrier arranged for operation in front of the opening, means whereby sections of metal rods are delivered to the carrier at one end thereof, a vibrating finger whereby said metal rods are moved lengthwise while on the carrier so that the rear ends of said rods enter the opening in the furnace, and means for imparting movement to said finger.

7. In a machine of the class described, an endless conveyor, a hopper arranged at one end thereof, there being an outlet at the lower end of said hopper, fingers projecting through the bottom of the hopper for agitating the sections of metal rods located in said hopper, and means for imparting movement to said fingers.

8. The combination with a furnace having an opening in one wall, of an endless carrier arranged for operation adjacent said opening, which endless carrier comprises a pair of chains one of which is adjustable relative to the other, means for imparting intermittent movement to the endless carrier, a hopper adapted to feed sections of metal rods onto the carrier, a vibrating finger for moving the sections of rods rearward while on the carrier so that the rear ends of said rods extend through the opening in the furnace, and means for imparting movement to said finger.

9. In a machine of the class described, the combination with a furnace having an opening in one wall, of an endless carrier, means whereby the endless carrier is intermittently driven, means whereby sections of metal rods are fed onto one end of the carrier, a
vibrating finger adapted to successively engage the sections of rods whereby said sections of rods are moved longitudinally while on the carrier so that their rear ends enter the opening in the furnace, and means for imparting movement to said finger.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this twenty-first day of March, 1910.

CHARLES E. MITCHELL.

Witnesses:

GEORGE LOWERY,

CLEMENT C. WALTERS.