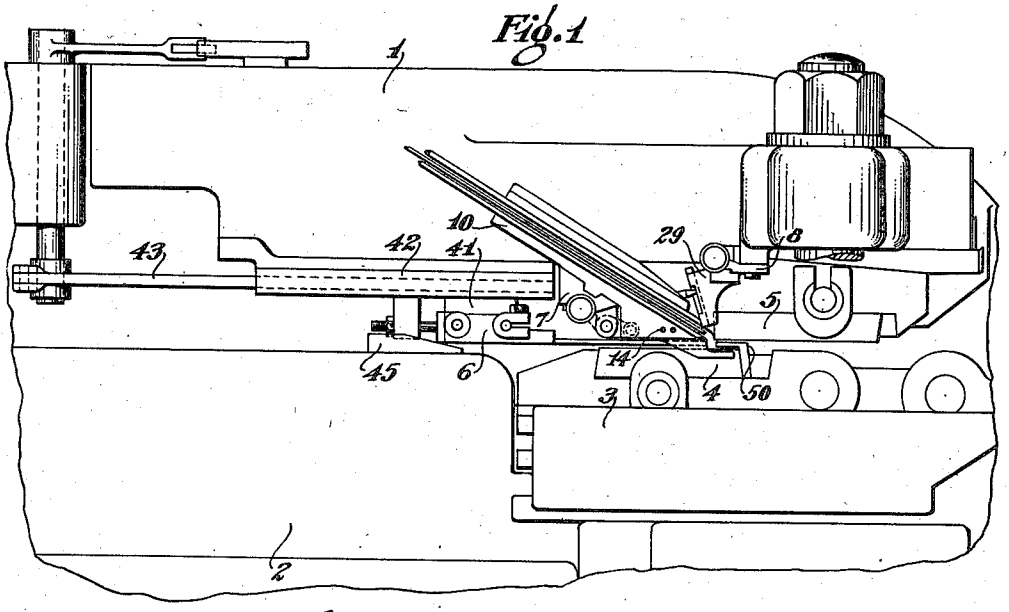
March 1, 1938. J. H. FRIEDMAN 2,109,918

MACHINE FOR MAKING BOLTS AND THE LIKE

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Fig. 1



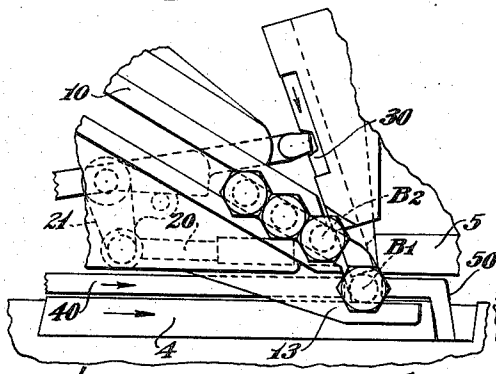


Fig. 5

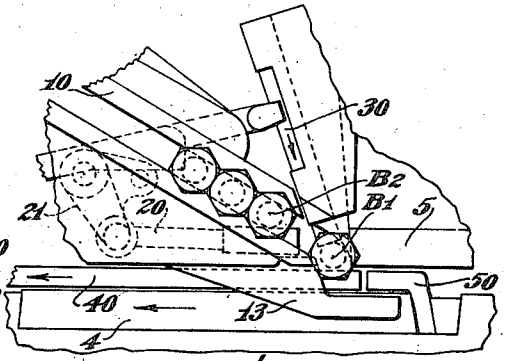


Fig. 4

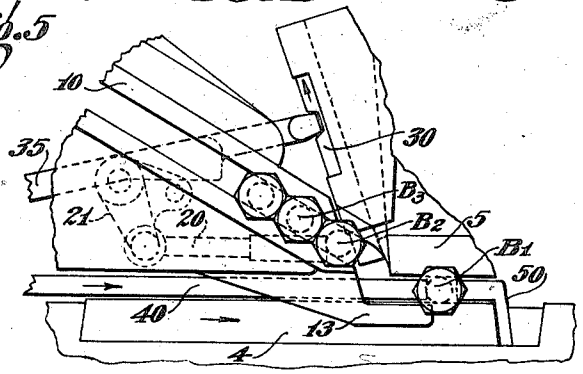


Fig. 6

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MACHINE FOR MAKING BOLTS AND THE LIKE

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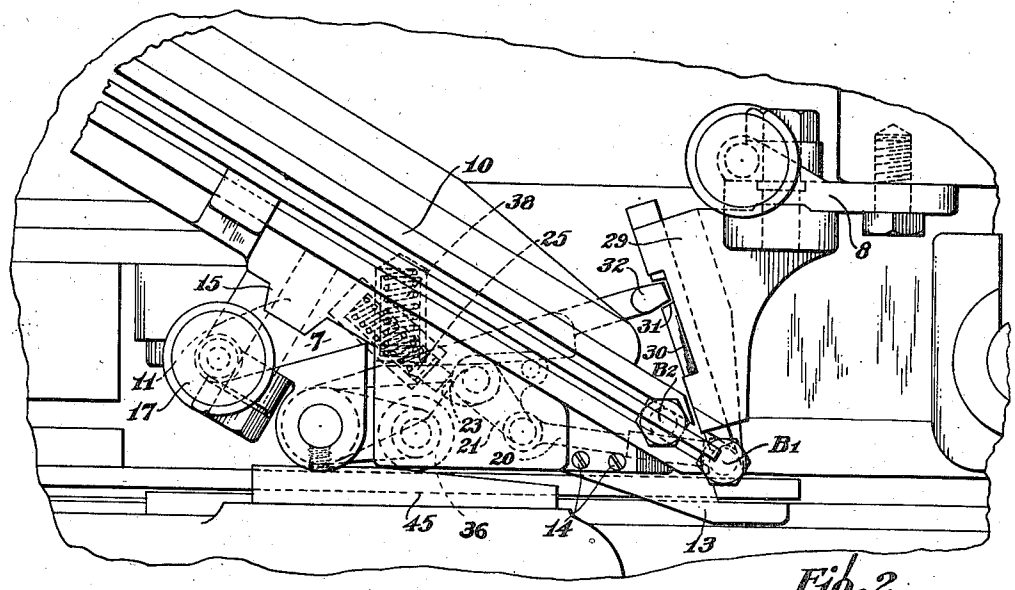


Fig. 2

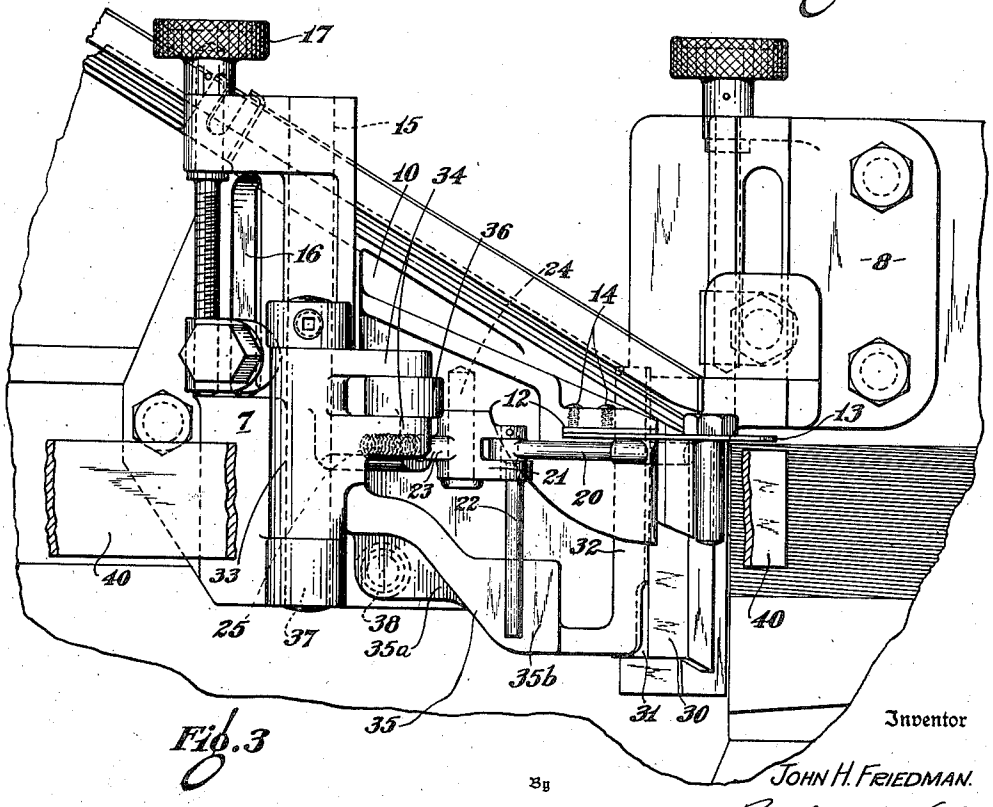


Fig. 3

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MACHINE FOR MAKING BOLTS AND THE LIKE

Filed Nov. 13, 1935 3 Sheets-Sheet 3

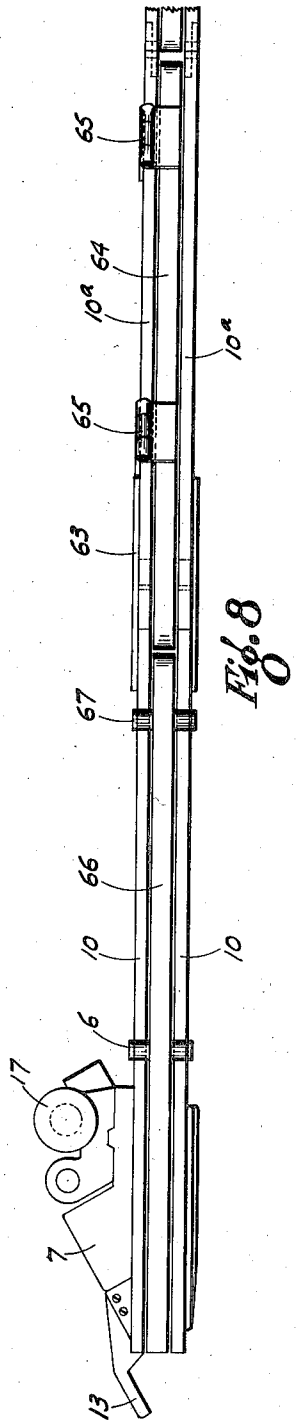


Fig. 8

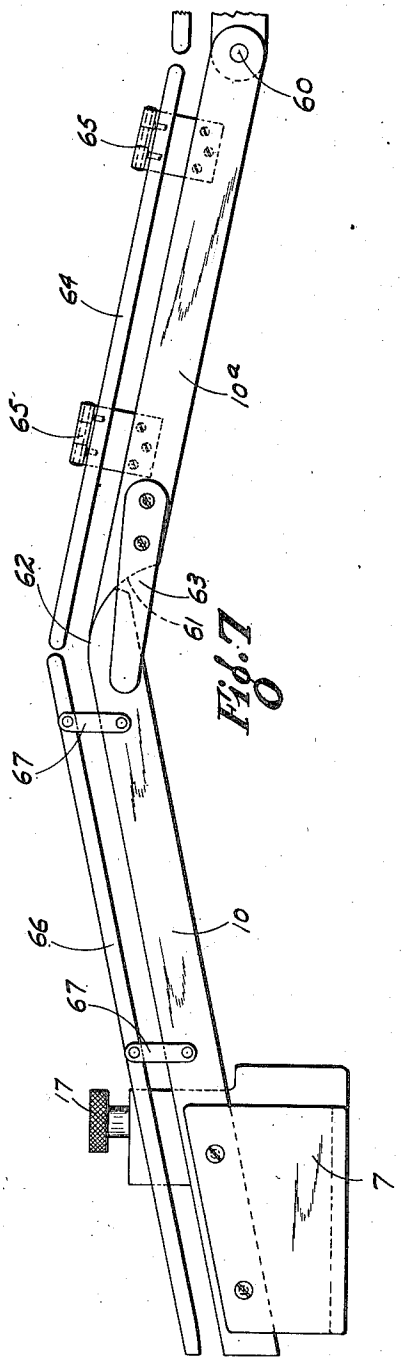


Fig. 7

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Patented Mar. 1, 1938 2,109,918

UNITED STATES PATENT OFFICE

2,109,918

MACHINE FOR MAKING BOLTS AND THE LIKE

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Application November 13, 1935, Serial No. 49,477

25 Claims. (Cl. 10—11)

This invention relates broadly to machines for making bolts, screws, and like headed articles, such for example as the machine disclosed in the patent to Frost, No. 2,020,658, November 12, 1935, and is particularly concerned with new and improved blank handling and feeding mechanism for such machines.

In blank feeding mechanisms embodying an inclined track or chute which delivers blanks to a flat horizontal plate or feeding position upon which the blanks are moved by pushers, there is always a tendency for blanks to stick or jam in the angle between the inclined and horizontal portions of the track before the foremost blank reaches a position to be engaged by the pusher. To prevent this it is customary to permit a series of blanks to build up in the inclined portion of the track so that their weight presses the foremost blank into alignment with the pusher. This construction however is also objectionable in that it permits the head of one blank to get on top of the next succeeding blank and in many cases to jam the track.

An object of the invention is to provide in machines of the above mentioned type improved means for automatically effecting the positive advance of headed blanks from one portion of the track to another and to coordinate with such means a fabricating means such as for instance roll threading dies.

Another object of the invention is to provide in bolt making and like machines improved vertical adjusting means for a blank feeding mechanism to accommodate blanks of various lengths.

Another object of the invention is to provide an improved blank track leading to a feeding mechanism according to the foregoing objects which compensates for vertical adjustments of the feeding mechanism.

More specifically, it is a further object to provide a bolt blank track leading from a fixed point to a vertically adjustable roll threader track section which will automatically compensate for differences in distance between said fixed point and said track occasioned by adjustment of said roll threader track section.

Another object of the invention is to provide a bolt blank track between a pointer mechanism and a vertically adjustable roll threader feed mechanism wherein the track has oppositely inclined portions, one portion changing its inclination and the other retaining its original inclination upon adjustment of the roll threader feed mechanism.

Another object of my invention is to provide in bolt making and like machines an improved bolt blank aligning abutment carried by a thread rolling die which is adapted to extend into the space between the dies and cooperate with a pusher therein to accurately align and hold bolt blanks in alignment at the initiation of the thread rolling process.

The foregoing and other objects and advantages will become apparent in view of the following description taken in conjunction with the drawings, wherein:

Figure 1 is a plan view of a part of a bolt making machine embodying the invention;

Figure 2 is a plan view of the blank feeding mechanism applied to a track conducting headed blanks to roll threading dies;

Figure 3 is an elevation of the blank feeding mechanism with parts broken away;

Figures 4, 5 and 6 are partial plan views of the blank feeding mechanism illustrating the positions of the parts at different stages of blank movement;

Figure 7 is an elevation of the blank feeding mechanism and track leading thereto from a pointer mechanism; and

Figure 8 is a plan view of the device shown in Figure 7.

For the purpose of illustration the blank feeding mechanism is shown as applied to a bolt making machine of the type disclosed in the patent above noted, it being understood that it could be used with other types of machines for manufacturing headed articles which embody parts adaptable for operative association with the present mechanism.

Referring to the drawings in detail, the reference numeral 1 indicates generally the bed frame of the machine, in which a header slide 2 is mounted for longitudinal reciprocation through the medium of a crankshaft (not shown). The forward extremity of the bed frame is provided with a die breast which has mounted thereon a plurality of dies. Bolt blanks are successively worked in the dies and are then conducted through a pointer mechanism to a pair of roll threading dies 4 and 5 mounted at the rear end of the bolt making machine. Preferably one of the roll threading dies 5 is carried by the bed frame 1 and the other roll threading die 4 is mounted in a movable slide 3 carried by the header slide 2.

The foregoing parts are common to machines of this type and their operation is well understood by those having a knowledge of the art.

I have attained the objects and advantages outlined by providing in a machine of the type referred to, a novel blank feeding mechanism

which is vertically adjustable with respect to horizontally reciprocating roll threading dies and providing a track between said blank feeding mechanism and a pointer mechanism mounted on the bed frame of the machine. Since in machines of the type referred to the blanks are discharged from the pointer mechanism at a relatively fixed point on the bed frame of the machine and since vertical adjustment of the roll threading feed mechanism changes the distance between the feed mechanism and the pointer discharge, it is necessary that the track between the two points be constructed to accommodate adjustment of the roll threader feed mechanism.

Generally speaking, the track which I have provided between the roll threader feed mechanism and the pointer discharge comprises two sections 10 and 10*a*, the former being integrally formed or attached to the roll threader feed mechanism and the latter pivoted to the pointer discharge track. This arrangement provides that the section 10 retain its inclination with respect to the feed mechanism irrespective of the vertical adjustment of the feed mechanism and that the section 10*a* is supported at one end by section 10 and therefore has a variable inclination depending on the vertical adjustment of section 10. The section 10 and blank feeding mechanism vertically adjustable therewith is supported with respect to the bed frame by means of an adjusting bracket 7 which is provided with a vertical groove 15 receiving a complementary tongue carried by the track section 10 (see Figures 2 and 3). The groove in the bracket 7 is preferably formed with sloping side walls to obviate any tendency of the track to tilt in the groove and the bottom of the groove is slotted as at 16 to receive a bolt or cap screw threaded into the section 10. An internally threaded carrier block is mounted on the bolt 11 and receives the threaded shank of an adjusting screw 17 rotatably mounted on top of bracket 7. A loosening of the bolt 11 will release any binding in the tongue and groove at 15 and rotation of the journalled adjusting screw 17 will raise and lower the section 10 including the track and certain portions of the blank feeder mechanism carried thereby. Subsequent to adjustment of this section the bolt 11 may be tightened to secure the track and feeder mechanism in position for operation.

The blank track 10 is slotted in the usual manner to support the bolt blanks by their heads and thus the bolts are vertically disposed for horizontal movement into a position between the roll threading dies 4 and 5. The forward lower end of the track adjacent the threading dies is preferably slotted as at 12 to receive a nose plate 13 which projects laterally beyond the end of the track and in effect forms a horizontal extension of the blank track. The nose plate 13 is removably secured to the blank track casting by means of set screws 14 or other suitably yielding conection means in order to provide a safety release for any blanks that might become lodged between the die parts of the blank feeding mechanism. The guard 66 which overhangs the blank track section 10 maintains the orderly descent of the blanks and prevents any overlapping of the heads of the blanks as they are fed down the track and out on to the nose plate 13. The end of the guard 66 adjacent the roll threading dies is tapered or rounded slightly (see Figure 3) so as to maintain the underside of the head of the blank against the nose plate and in proper threading position as the blank is being advanced by the feed mechanism.

The blank feeding mechanism employed to move the bolt blanks from the lower end of the inclined track and out onto the extension 13 comprises generally three associated pusher members or fingers 20, 30 and 40. The first of the pusher fingers to engage a bolt blank as it is being fed into the roll threading dies is the pusher finger 20 which is mounted in and is vertically adjustable with the blank track 10. The second pusher finger 30 is separately supported by a bracket 29 which is vertically adjustable with respect to the bed frame as at 8, said last named adjusting device being substantially like the adjusting means heretofore described in connection with the adjustment of the blank track casting 10. The third pusher member or main pusher 40 is arranged in the plane between the roll threading dies and moves a bolt blank heretofore controlled by pushers 20 and 30 into a blank rolling position between the dies. All of said pushers are movable with respect to each other and are actuated in timed relation to each other and with the roll threading mechanism. The angularity of the pushers with respect to each other and with respect to the path of the blanks along the track and into the roll threading dies permits each of the pushers to alternately advance and gate the blanks in their travel to the threading dies.

The pusher 20 is arranged to reciprocate through a suitable aperture formed in the track casting 10 at the lower end thereof and receives its reciprocating motion from a bell crank 21 pivotally mounted on said casting as at 24. An abutment or lug 23 carried by said bell crank is arranged to bear against a spring and plunger assembly 25 in a manner which constantly urges the bell crank in one direction (in a clockwise direction in the plan view of Figure 2). A round pin or cam member 22 depends from the underside of the bell crank and bears against a cam surface 35*b* carried by the oscillating actuating device 35 pivoted to bracket 7 and therefore non-adjustable.

The actuator member 35 comprises a generally U-shaped member with a bearing sleeve 33 at one side journalled on a pin 37 anchored to the bracket 7 and a vertical portion 32 slidably fitting in the notch 31 of the pusher 30. The bight portion of the U-shaped member 35 is provided with surfaces 35*a* and 35*b*, the former having considerable vertical extent adapted to contact a spring and plunger assembly 38 carried in the blank track casting and the latter bearing against the depending pin 22 carried by the bell crank member 21. The spring and plunger assembly 38 constantly urges the U-shaped member 35 about its axis in a clockwise direction and thus urges the pusher 30 towards the lower end of the blank track. Since the depending arm 22 tends to move the bell crank member 21 in clockwise direction through the engagement with the cam at 35*b*, the two spring assemblies act oppositely on the bell crank member 21. The spring assembly 38 is designed to exert a greater actuating force than the spring assembly 25 and thus the spring assembly 25 becomes effective to move the bell crank member 21 and pusher 20 only when the actuator 35 is moved counter-clockwise to relieve the arm 22 from engagement with 35*b*.

The bearing sleeve 33 of the U-shaped actuator 35 has formed thereon a pair of spaced verti-

cally aligned arms 34 which receive therebetween a cam roller 36 adapted to engage a cam 45 carried by the header slide 2. The spring and plunger assembly 38 normally act to swing the U-shaped member clockwise about its pivot and thus the pusher 30 is held in its projected position as shown in Figure 4 except when the roller 36 is in engagement with the cam 45 as shown in Figure 2, or when held by a gated blank as in Figure 4.

When the blank track 10 and the bracket 29 are adjusted vertically with respect to the frame brackets 7 and 8 respectively to accommodate various lengths of bolt blanks and threads, the U-shaped actuator 35 pivoted to bracket 7 remains fixed vertically. The bight portion of the bracket is extended vertically at 35*a* to provide an abutment for the spring and plunger 38 movable with the blank track and is extended laterally at 35*b* to provide a cam for the depending arm 22 of the bell crank member 21 which is also movable with the track 10. The side portion 32 of the actuator 35 is uniform in cross section throughout its vertical extent and operates in groove 31 to move the pusher 30 regardless of the relative vertical position of the parts.

The third pusher to engage the bolt blanks in their advance to the roll threading dies and which actuates the other pushers is the member 40 arranged to reciprocate between the roll threading dies. The pusher 40 is secured to a bracket 6 which may be vertically adjustable with respect to the frame in substantially the same manner as the bracket 29 and is carried by a block 41 slidably mounted in a guideway 42 on the bed frame. To actuate the block 41, it is reciprocated by a link 43 operatively moved by means of a cam geared to the main crankshaft of the bolt machine. The pusher 40 is thus timed with respect to the header slide movements and is arranged to advance the bolt blanks along the nose piece 13 and into position between the roll threading dies at the initiation of the roll threading motion.

To cooperate with the pusher 40 in positioning the blanks between the dies, an abutment member 50 is provided on the movable die. The abutment 50 consists of an angle member with one web thereof clamped between the end of the movable die and the wedge block holding the die in place. The other web of the member 50 overhangs a portion of the die face and thus projects into the path of the bolt blank between the dies. The projecting web has a vertical extent corresponding to the vertical extent of the threads on the die and is adapted to engage one side of the shank of a bolt blank fed into the dies. The pusher 40 functions to move a bolt blank into engagement with the abutment 50 and cooperate therewith to firmly grip the blank and vertically align the blank during the first part of the thread rolling operation. The provision of the abutment 50 in conjunction with the pusher 40 obviates the danger of blank misalignment and thus contributes greatly to the uniformity of product and speed at which the machine may be operated. Without such an abutment a certain interval of time would be required between the feeding of the blank and the thread rolling to accommodate the "swaying" of the blank imparted by the action of the feeding mechanism. It would not be safe to start the thread rolling until the "swaying" had subsided.

Figure 2 illustrates the position of the pushers at the end of a roll threading operation and as the header slide approaches the full extent of its receding movement with respect to the die breast. The cam 45 as shown has engaged the roller 36 and against the action of the spring and plunger 38 has rotated the U-shaped actuator 35 counterclockwise and withdrawn the pusher 30 from its gating position in the blank track. The counterclockwise movement of the actuator 35 has permitted the spring and plunger assembly 25 to function to turn the bell crank member 21 counter-clockwise and thus move the pusher 20 forward. The double function of the forward movement of pusher 20 is to advance a bolt blank B^1 into the path of pusher 30 and to gate the bolt blank B^2 on the inclined portion of the blank track. The bolt blank B^1 is gated from alignment with the threading dies by the pusher 40.

As the header slide moves back from the position shown in Figure 2, the parts assume the position shown in Figure 4. Although the cam 45 no longer bears against the roller 36 the pusher 30 is held to a limited extent in its retracted position by reason of the bolt blank B^1 which remains gated by the pusher 40. The partially retracted position of pusher 30 through spring assembly 25 holds the pusher 20 in gating position.

The blank B^1 is shown in Figure 5 as advanced into the path of the threading dies. The pusher 40 is withdrawn from a gating position as the header slide moves toward the forward end of the bed frame. The spring pressed pusher 30 advances the bolt blank B^1 and the depending pin 22 on the bell crank member 21 is moved through the cam 35*b* on the U-shaped member 35 in a clockwise direction to effect a compression of the spring and plunger assembly 25. As the member 21 is moved in a clockwise direction the pusher 20 is withdrawn from gating position and the bolt blank B^2 is advanced to engage the pusher 30 which is now in a gating position.

As the header slide starts a thread rolling operation, the pusher finger 40 moves the bolt blank B^1 into a position between the dies 4 and 5 and into engagement with the abutment 50 as shown in Figure 5. This moves the pusher 40 into a gating position where it remains until the thread rolling operation is completed on bolt blank B^1. The pusher 40 follows the blank into the path between the dies to insure alignment of the blank during the first part of the thread rolling operation. The bolt blank B^2 is then advanced to the position heretofore occupied by B^1 in preparation for a repetition of the feeding and thread rolling cycle.

The bolt blanks are also guided into proper alignment with the threading dies by reason of the nose plate 13 which supports the bolt blanks by their heads while being advanced between the dies. Since the nose plate 13 supports the blank prior to its engagement with the abutment 50 any lateral cocking or tilting with respect to the abutment is prevented.

It is to be noted that the bolt blank B^2 as shown in Figure 6 is gated by the pusher 30 and the bolt blank B^3 is gated by the pusher 20. The pusher 20 is thus in both a gating and a pushing position and upon retraction of pusher 30, the pusher 20 simultaneously advances the blank B^2 and gates the blank B^3.

In conjunction with the operation of the mechanism it will be observed that the gating effect of one pusher may cooperate with the springs 25 and 38 to effect a rapid spring responsive movement of another finger. An illustration of this is found in Figure 6 where the member 35 is moving counter-

clockwise. The bell crank 21, however, is restrained from counter-clockwise movement therewith by reason of the gating action of pusher 30 on the blank B^2. As soon as the member 35 has completed its counter-clockwise movement the pusher 30 is moved from its gating position and the pusher 20 "snaps" forward to advance the blank B^2 in response to the spring 25. Another illustration of this "snap" action is found in Figure 4 where the pusher 40 acts to gate the blank B^1. At this time the cam 45 on the slide has moved out of engagement with the roller on the member 35 and the member 35 is urged in a clockwise direction by the spring 38. As soon as the pusher 40 ceases to gate the blank B^1 the pusher 30 "snaps" forward to advance the blank B^1 into the path between the roll threading dies.

In the embodiment shown in the drawings; the headed blanks are transferred from a position on the blank track to a position upon a horizontal extension of the blank track where the blanks are engaged by a pusher and thereby advanced to a position between a pair of roll threading dies. It will be understood, however, that the blank feeding mechanism could be coordinated and arranged in relation to operations other than the roll threading operation and that blank feeding could be effected from one blank track to another track or one point on a blank track to another without interruption for fabricating purposes without departing from the spirit or scope of the invention.

To conduct the bolt blanks from a pointer mechanism or the like the track section 10a is pivoted as at 60 to the discharge track leading from the pointer mechanism and is rounded at said pivotal connection to fit within an arcuate recess formed adjacent the terminus of the discharge track so that bolt blanks moved along the track will not have their progress impeded by any projecting portions at the juncture between the two tracks (see Figure 7). The other end of the track section 10a is cut away on its underside as at 61 to provide an arcuate bearing surface adapted to slide freely upon the rounded end of the track 10 as at 62. Plates 63 are preferably secured to the outer surface of the track section 10a to prevent misalignment of the two track sections 10 and 10a at their juncture. The curved complementary parts 62 and 61 insure that the two track sections maintain a continuous supporting surface for the heads of the blanks at the junction between the two tracks and also compensate for the difference in distance between the pivot 60 and the feeder track 10 occasioned by vertical adjustment of the feeder track.

When the track section 10 is in its lowermost position; that is, to feed bolt blanks which are to be threaded throughout the shank portion, there will be considerable overlapping at 61 and 62, whereas when the track 10 and associated feeder mechanism is raised to feed long bolts which are only threaded adjacent the end of the shank the curved part 61 will be supported only at the outer end of the curved part 62. A guard rail section 64 is hinged through brackets 65 to the track section 10a and maintains a constant head space to preclude movement of one blank head upon the other. The track section 10 is also preferably guarded in this respect by the rail 66 secured to track section 10 as at 67.

From the foregoing it will appear that I have provided a track and feeder combination adapted to receive bolt blanks ejected from a pointer or other fabricating mechanism at a fixed point and conduct said blanks in an orderly manner and positively and rapidly feed same to a roll threading mechanism. The feed mechanism may be adjusted to various heights to accommodate different sizes and types of bolts and the novel track combined therewith automatically compensates for track length variations occasioned by said adjustments.

It will be understood by those skilled in the art that the blank feeding mechanism may be applied to blank tracks at other angles than that shown and may be advantageously employed where all the bolt blank movements are in the same plane. It will also be understood that important advantages other than those heretofore recited may be obtained by use of the present mechanism, and that the specific constructions shown and described to obtain these advantages are not to be construed in the nature of limitations, the scope of the invention being defined by the appended claims.

I claim:

1. In a bolt making machine, a reciprocating header slide, a thread rolling die supported for relative longitudinal movement by said slide and a coacting relatively stationary thread rolling die, means having an operative connection with said slide and reciprocable die for reciprocating the latter, and a means for feeding bolt blanks to said dies comprising, a blank track having inclined and horizontal portions, a pair of spring pressed pusher fingers arranged at the junction between said inclined and horizontal portions to advance bolt blanks in sequence to the horizontal portions and a pusher arranged between said dies to advance bolt blanks from the horizontal portion therebetween.

2. In a bolt making machine, a reciprocating header slide, a thread rolling die supported for relative longitudinal movement by said slide and a coacting relatively stationary thread rolling die, means having an operative connection with said slide and reciprocable die for reciprocating the latter, and a means for feeding bolt blanks to said dies comprising, an inclined bolt blank track terminating in a horizontal portion, a pusher finger adjacent the junction between the inclined and horizontal portions adapted to enter said track at an angle to advance bolt blanks between the pusher and the dies and to gate bolt blanks between the pusher and the inclined track.

3. In combination, a mechanism for pointing the shanks of a series of bolt blanks, a roll threading mechanism for rolling threads upon said series of blanks in the same consecutive order in which they are pointed, a track leading from said pointer mechanism to said roll threading mechanism comprising spaced parallel portions adapted to support bolt blanks by their heads, a blank feeding means mounted on said roll threading mechanism and vertically adjustable with respect thereto, one portion of said track vertically movable with said blank feeding means and another portion of said track fixed with respect to said blank feeding means.

4. In combination, a pointer mechanism having a discharge track and a roll threading mechanism having a vertically adjustable blank feeding means, an articulated track arranged between said two mechanisms, one end of said track fixed to said pointer mechanism and the other end of said track movable with said vertically adjustable blank feeding means, means intermediate the ends of said track to accommodate variations in track length occasioned by

vertical adjustment of said blank feeding means.

5. In a blank feeding mechanism, a track for headed bolt blanks comprising an inclined section, a horizontal section and a second horizontal section at an angle to the first horizontal section, a spring pressed reciprocating pusher finger entering said inclined track section at an angle thereto, a second spring pressed reciprocating pusher finger movable along said first horizontal section in the direction of its length, a third reciprocating pusher finger movable along said second horizontal section in the direction of its length.

6. In a machine for making bolts, a pointer mechanism having a discharge track fixed with respect to the bed frame of said machine, a pair of roll threading dies, one die being secured to the bed frame of the machine and the other die arranged to reciprocate horizontally in the bed frame of the machine, means to feed headed bolt blanks into said roll threading dies and means to adjust said last mentioned means vertically with respect to the bed frame of the machine to accommodate various lengths of bolt blanks, a track arranged between said blank feeding means and said pointer discharge track to lead bolt blanks suspended by their heads from said pointer discharge track to said blank feeding means, means arranged intermediate the ends of said track to accommodate variations in track length between said pointer discharge track and said blank feeding means occasioned by vertical adjustment of said blank feeding means.

7. In a machine for making bolts, a horizontal track for suspending blanks by their heads fixed with respect to the bed frame of said machine, relatively reciprocable roll threading dies arranged in said machine and an inclined track section leading to said roll threading dies, means to adjust said inclined track section vertically and maintaining the inclination with respect to the roll threading dies to accommodate various lengths of bolt blanks, a track section arranged intermediate said inclined track and said horizontal track having one end pivoted to said horizontal track and the other end pivotally and slidably connected to said inclined track.

8. In a bolt blank feeding mechanism, a track for bolt blanks comprising a storage section, a fabricating section and an intermediate section, a pair of spring pressed reciprocating pusher fingers sequentially operated to advance bolt blanks successively along said storage section and said intermediate sections, and a reciprocating pusher finger to advance bolt blanks forwarded thereto by said pair successively along said fabricating section.

9. In combination, a pair of spaced fabricating mechanisms for performing different operations upon bolt blanks, the first of said mechanisms having a horizontal discharge track for suspending the bolt blanks by their heads subsequent to the working of the blank in that mechanism, an articulated track leading from said horizontal track to said second mechanism, the end of said articulated track adjacent said second mechanism being inclined with respect to said mechanism and vertically adjustable while maintaining the inclination with respect to said mechanism, the end of said articulated track adjacent said horizontal track being fixed with respect to said horizontal track and having an inclination which varies in response to vertical adjustments at the adjustable end of said articulated track and means intermediate the ends of said articulated track to compensate for the differences in track distance between said two mechanisms occasioned by vertical adjustment of the track adjacent the second mechanism.

10. A track for guiding bolt blanks from one fabricating mechanism to another comprising a pair of articulated sections, one track section being vertically adjustable and having a constant inclination, the other track section having one end slidably and pivotally supported on said first named section and the other end pivoted adjacent one of said mechanisms.

11. In a bolt blank feeding mechanism, a track for bolt blanks, a plurality of reciprocating pusher fingers arranged to enter said track and advance bolt blanks sequentially therealong, a spring pressed member to move the first of said pusher fingers to advance a blank, a second spring pressed member to move the second of said pusher fingers to advance a blank, the force exerted by said second spring pressed member exceeding the force exerted by the first spring pressed member, an operative connection between said two members to effect a movement of said first member in response to movement of said second member, said second spring pressed member moved against the action of its spring by a cam to withdraw said second pusher finger from the blank track, said cam actuated movement of said member releasing the operative connection between the said two members to effect blank advancing movement of the first pusher finger in response to said first spring pressed member.

12. In a bolt blank feeding mechanism, a track for bolt blanks, a plurality of reciprocating pusher fingers arranged to enter said track and advance bolt blanks sequentially therealong, a spring pressed member to move the first of said pusher fingers to advance a blank, a second spring pressed member to move the second of said pusher fingers to advance a blank, the force exerted by said second spring pressed member exceeding the force exerted by the first spring pressed member, an operative connection between said two members to effect a movement of said first member in response to movement of said second member, said second spring pressed member moved against the action of its spring by a cam to withdraw said second pusher finger from the blank track, said cam actuated movement of said member releasing the operative connection between the said two members to effect blank advancing movement of the first pusher finger in response to said first spring pressed member, a third pusher finger arranged in said track between said first mentioned spring actuated pushers and a bolt blank fabricating device.

13. In a bolt making machine, a reciprocating header slide, a thread rolling die supported for relative longitudinal movement by said slide and a coacting relatively stationary thread rolling die, means having an operative connection with said slide and reciprocable die for reciprocating the latter, and a means for feeding bolt blanks to said dies comprising, a track for bolt blanks, a plurality of reciprocating pusher fingers arranged to enter said track and advance bolt blanks sequentially therealong, a spring pressed member to move the first of said pusher fingers to advance a blank, a second spring pressed member to move the second of said pusher fingers to advance a blank, the force exerted by said second spring pressed member exceeding the force exerted by

the first spring pressed member, an operative connection between said two members to effect a movement of said first member in response to movement of said second member, said second spring pressed member moved against the action of its spring by a cam to withdraw said second pusher finger from the blank track, said cam actuated movement of said member releasing the operative connection between the said two members to effect blank advancing movement of the first pusher finger in response to said first spring pressed member, a cam carried by said header slide arranged to engage said second spring pressed member to effect a withdrawal of said second pusher finger at each cycle of header slide movement.

14. In a bolt making machine, a reciprocating header slide, a thread rolling die supported for relative longitudinal movement by said slide and a coacting relatively stationary thread rolling die, means having an operative connection with said slide and reciprocable die for reciprocating the latter, and a means for feeding bolt blanks to said dies comprising, a track for bolt blanks, a pair of operatively connected spring pressed reciprocating pusher fingers arranged to enter said track and advance bolt blanks therealong, means connected to one of said pusher fingers, means carried by said header slide and arranged to engage said first named means upon reciprocation of the header slide to effect actuation of said pusher fingers.

15. In a bolt making machine, a blank feeding mechanism, a bolt blank track member supported by said machine for vertical adjustment, a pusher finger carried by said track member to enter the path of bolt blanks and advance bolt blanks therealong, a second pusher finger mounted on said machine in a supporting bracket, said bracket vertically adjustable with respect to said machine and with respect to said track member.

16. In a bolt making machine, a blank feeding mechanism, a bolt blank track member supported by said machine for vertical adjustment, a pusher finger carried by said track member to enter the path of bolt blanks and advance bolt blanks therealong, a second pusher finger mounted on said machine in a supporting bracket, said bracket vertically adjustable with respect to said machine and with respect to said track member, and a pair of springs mounted in said track member, each spring operatively engaged with an actuator means for one of the pusher fingers.

17. In a blank feeding mechanism, a storage track for blanks, a fabricating device, three reciprocating pusher fingers arranged between the storage track and the fabricator to advance bolt blanks to the fabricator, the first pusher finger disposed adjacent the stored blanks, the third pusher finger disposed adjacent the fabricator and the second pusher finger disposed intermediate the first and third, means to retract the second pusher finger during the advance of the first and third pushers, the third pusher gating a blank advanced by the first pusher.

18. In a blank feeding mechanism, a track for storage of bolt blanks, a pusher for said track, a fabricator adjacent said track, a pusher for said fabricator, an intermediate pusher between said track pusher and said fabricator pusher, the side portions of said pushers gating blanks simultaneously as the end portions advance blanks towards said fabricator.

19. In a machine for making bolts, a pointer mechanism for pointing the ends of the shanks of a series of bolt blanks, a roll threader mechanism spaced from said pointer and a track arranged between said pointer and roll threader to conduct the blanks from the pointer to the threader in sequence, said track comprising spaced rails for suspending the bolt blanks by their heads therebetween, said track having a pair of oppositely inclined sections whereby the inclined track section adjacent the pointer is filled with blanks before a blank has moved over the point of opposite inclination and the inclined section near the roll threader serves to accommodate and store the excess blanks in event that there is a variation between the number of blanks pointed and the number of blanks threaded over a period of time.

20. In a bolt blank feeding mechanism, a track for bolt blanks, a plurality of reciprocating pusher fingers arranged to enter said track and advance bolt blanks sequentially therealong, spring means normally urging the first of said pusher fingers forwardly into said blank track in a position to advance a blank, a second spring means normally urging the second of said pusher fingers into said blank track to advance a blank, the force normally exerted by one of said spring means exceeding the force exerted by the other and means connecting said first and second pusher fingers whereby forward movement of one finger in response to its spring means moves the other finger in a direction to overcome the spring means thereof and thereby effect a withdrawing movement of said other pusher finger.

21. In combination, a reciprocating roll threader, a blank feeding mechanism for said roll threader comprising a blank track terminating adjacent said roll threading dies arranged to suspend bolt blanks by their heads between said dies and a blank storage track arranged at an inclination with respect to said first named track, said storage track comprising spaced rails to support bolt blanks by their heads and a guard overhanging said spaced rails to engage the heads of the blanks and guide the blanks therealong, a pusher finger reciprocating in timed relation to said roll threader arranged to enter said inclined track section adjacent its juncture with said first mentioned track section and advance bolt blanks into said juncture, the portion of said guard adjacent said juncture being tapered to guide the heads of the bolt blanks across said juncture and into proper thread rolling position in said first mentioned track.

22. In a roll threading mechanism, a pair of reciprocating roll threading dies, a blank feeding mechanism comprising a main pusher arranged to reciprocate in the path of the bolt blank between said roll threading dies, a blank feeding track terminating along one side of said main pusher and being gated through the major portion of the roll threading cycle by said pusher, a pair of spring pressed feeding pushers arranged to enter said blank feeding track and resiliently urge bolt blanks therealong against said main pusher.

23. In a roll threading mechanism for headed bolt blanks, a track for bolt blanks comprising spaced portions for suspending the bolt blanks by their heads, said track terminating between the roll threading dies, a reciprocating main pusher finger arranged between the roll threading dies and normally gating the end portion of the track to prevent movement of bolt blanks into the end of the track during the major por-

tion of the roll threading cycle, said main pusher operative to withdraw from its gating position and permit a bolt blank to reach the terminus of the track at the initiation of a thread rolling cycle, a pair of feeder fingers arranged to enter said track and successively advance bolt blanks therealong, one of said feeder fingers resiliently pressing a bolt blank against said main pusher when said main pusher is in its gating position and the other of said feeder fingers gating the remaining blanks in said track during the gating of said first named blank by said main pusher.

24. In a roll threading mechanism, a pair of reciprocating roll threading dies, a blank feeding track terminating in the path between said roll threading dies, a member movable with one of said roll threading dies and positioned thereby adjacent the end of said blank feeding track at the initiation of a roll threading stroke, a main pusher arranged between said roll threading dies in alignment with said last named member arranged to move away from said member and permit the advance of a bolt blank along said track and into position between said member and said pusher, reciprocating feed means arranged to enter said track adjacent the terminus thereof to feed bolt blanks into position between said main pusher and said member, said main pusher moving with respect to said member and clamping a bolt blank between said pusher and member during the initiation of a roll threading stroke.

25. A track for guiding bolt blanks from one fabricating mechanism to another comprising a pair of articulated sections, one track section being vertically adjustable and having a constant inclination, the other track section having one end thereof pivotally and slidably supported to accommodate the variations in track length occasioned by vertical adjustment of said vertically adjustable section and the other end of said other track section being pivotally mounted to accommodate the angular variations thereof occasioned by adjustment of said inclined track section.

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