Feb. 5, 1929. 1,700,736

C. T. BRENNAN

ROLL FEED FOR METAL HEADING MACHINES

Filed Aug. 13, 1927

Fig. 1

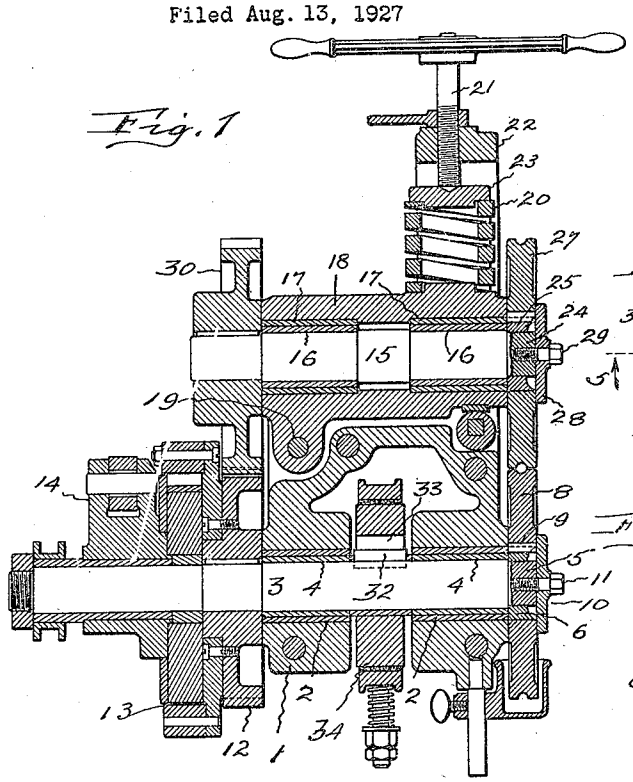


Fig. 4

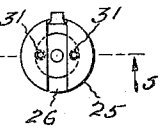


Fig. 5

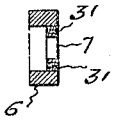


Fig. 2

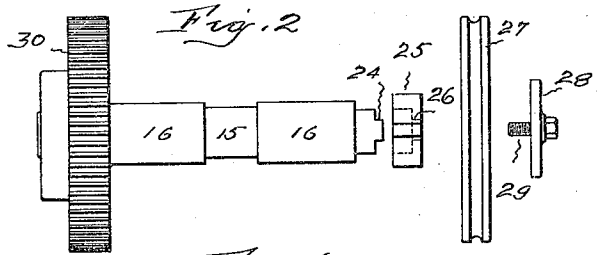
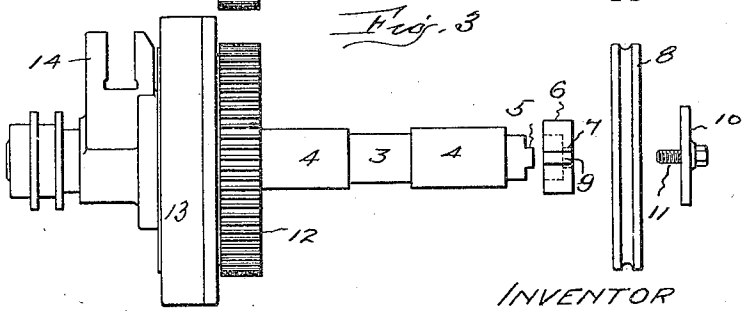


Fig. 3



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Patented Feb. 5, 1929. 1,700,736

UNITED STATES PATENT OFFICE.

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ROLL FEED FOR METAL-HEADING MACHINES.

Application filed August 13, 1927. Serial No. 212,626.

Stock in the form of a rod or a coil of wire is commonly fed into machines in which it is cut and then swaged, headed or punched, by rolls that grip the stock and are intermittently rotated to advance the end of the stock to the operating tools.

In these machines to ensure an accurate advance of the stock the feed rolls must grip the stock with a strong bite, and to provide the necessary grip, and permit the use of stock of different diameters, and enable the rolls to be separated for the removal of the end of a coil or rod and the insertion of the end of another piece of stock, the feed rolls are forced together by a very stiff spring. Usually this is effected by supporting the lower feed roll shaft in a fixed frame and mounting the upper feed roll shaft in a box pivoted to the frame, the free or roll end of which box is forced down by a spring. Owing to the extremely heavy pressure required to prevent the rolls from slipping on the wire and to ensure an accurate intermittent feed the bearings of the roll shafts, especially the bearings nearest the rolls, become severely worn in a short time and require frequent renewal.

The present invention relates to the mounting of the feed rolls and their shafts and the bearings therefor.

The object of the invention is to provide a construction for these parts whereby the bearings which are subjected to severe wear may be readily removed and new bearings substituted without dismantling all of the elements of the entire feed mechanism.

This object is attained by setting hardened and ground bearing bushings in the frame and box and setting on the shafts bearing sleeves that rotatably fit the bushings, and attaching the feed rolls to the shafts in such manner that they may be easily taken off and leave the shafts with the sleeves free to be withdrawn from the frame and box without removing the gears or the intermittently actuated driving elements from the shafts. When the shafts are removed the bearing sleeves may, by suitable means, be forced off the shafts and new ones substituted, after which the shafts may be replaced. This very much facilitates the removal and renewal of the bearings subject to the severest wear and eliminates the necessity of turning down the shafts and inserting new bearings in the frame and box, as is customary at the present time in the machines in common use.

In the accompanying drawings Fig. 1 shows a vertical section of a feed mechanism for a heading machine, said mechanism being constructed according to this invention. Fig. 2 shows the upper feed roll shaft with the feed roll and the parts which fasten it to the shaft separated therefrom. Fig. 3 is a similar view of the lower shaft and feed roll. Fig. 4 shows a front view of one of the caps which are applied to the ends of the shafts and upon which the feed rolls are mounted. Fig. 5 is a section of the cap.

The feed roll frame 1 is designed to be attached to the front end of a heading machine bed in the usual position, the machine itself being old and well known, is not shown. In suitable openings in the lower section of this frame hardened and ground steel bushings 2 are forced. On the lower shaft 3 there are forced sleeves 4, preferably bronze, the exteriors of which are ground and fitted to turn in the bushings. The front or roll end of the shaft is turned down and milled to provide a lug 5. Fitted upon this end of the shaft is a cap 6 which has a slot 7 that fits the lug so that the cap will be turned positively with the shaft. On this cap is fitted the lower feed roll 8, a key 9 being provided to ensure the rotation of the roll with the cap and shaft. After the feed roll has been placed upon the cap a holding plate 10 is secured in front of the roll by a screw 11 that is turned through the cap into the end of the shaft.

Keyed on the other end of the shaft is a driving gear 12, and the clutch 13 which is actuated by the arm 14 to give an intermittent rotatory movement to the driving gear in the manner well known to this type of feeds.

The upper shaft 15 has two sleeves 16 forced upon it. These sleeves are desirably of bronze and are ground to fit the hardened bushings 17 that are forced into the bearing box 18. This bearing box is pivotally mounted in the frame on the pin 19, and its front or roll end is forced down by the spring 20 which is compressed to give it the proper tension by the hand screw 21 that turns through an extension 22 of the box, against a plate 23 seated on the upper end of the spring. The front end of this upper shaft is milled off to provide a lug 24 and on this end of the shaft is fitted the cap 25 with slot 26 which

receives the lug. The upper feed roll 27 is fitted on this cap and is held in place by the plate 28 and screw 29 the same as is the lower feed roll. On the rear end of this upper shaft is a gear 30 that meshes with the driving gear 12.

Owing to the heavy pressure of the spring 20 and the resistance of the grip of the feed rolls on the stock, the front bearing sleeves 4 and 16, that is, the bearing sleeves set on the shafts nearest the rolls, are subjected to severe strains and wear out quickly. When it is necessary to renew these bearings the plates at the front of the feed rolls are removed. This permits the feed rolls to be taken off. Any suitable screws may then be turned through the threaded perforations 31 (Fig. 4) in the caps against the ends of the shafts so as to force the caps off from the ends of the shafts. With these parts removed after the key 32 (Fig. 1) is lifted from the lower shaft into the space 33 in the brake mechanism 34, the lower shaft with the driving gear, clutch and operating mechanism attached may be pulled out, after which the upper shaft with its gear may be withdrawn. When the shafts have been removed the bearing sleeves on the front end of the shafts, which are those that are subject to the severe wear, are forced off and other sleeves substituted. When the new sleeves are substituted the shafts are simply returned to position, the caps applied, the rolls placed upon the caps and the plates fastened in front. This arrangement provides a construction which is cheap to manufacture and assemble and facilitates the renewal of the parts which wear most quickly, when such is necessary.

The invention claimed is:

1. A roll feed mechanism for a metal heading machine, comprising a pair of shafts, each of which at one end has a detachable feed roll and at the other end has a driving gear, said shafts being supported so that the rolls may be opened from and closed toward each other, a spring tensioned to close said rolls together, the bearings for said shafts comprising bushings forced into openings in the supports and sleeves forced upon the shafts and adapted to rotatably fit in said bushings, and means detachably securing the feed rolls to the shafts, the forward ends of said shafts being smaller in diameter than the interior diameter of said bushings, whereby the feed rolls may be detached and the shafts and sleeves withdrawn from said bushings without removal of said gears from the shafts.

2. A roll feed mechanism for a metal heading machine, comprising a pair of shafts, one of which is supported in a fixed position and has a driving gear, while the other shaft is supported to oscillate and has a driving gear, the bearings for said shafts comprising bushings forced into openings in the shaft supports and sleeves forced upon the shafts and adapted to rotatably fit in said bushings, feed rolls detachably secured to said shafts, and a spring pressing against the oscillatory support and adapted to force the roll it carries toward the roll carried by the fixed support, the forward ends of said shafts being smaller in diameter than the interior diameter of said bushings, whereby the feed rolls may be detached and the shafts and sleeves withdrawn from said bushings without removal of said gears from the shafts.

3. A roll feed mechanism for a metal heading machine, comprising a pair of shafts, one of which is mounted in a fixed frame and has a driving gear and mechanism for imparting an intermittent rotation to said gear, while the other shaft is mounted in an oscillatory box and has a driving gear, the bearings for said shafts comprising bushings forced into openings in said frame and box and sleeves forced upon the shafts and adapted to rotatably fit in said bushings, caps detachably secured to and rotatable with the ends of the shafts, feed rolls detachably secured upon said caps, and a spring pressing against the swinging end of said box for forcing the roll it carries toward the roll carried by the frame, the forward ends of said shafts being smaller in diameter than the interior diameter of said bushings, whereby the feed rolls may be detached and the shafts and sleeves withdrawn from said bushings without removal of said gears from the shafts.

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