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G. BAEHR

FEED CONTROL DEVICE FOR DIE ROLLS

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FIG. 1.

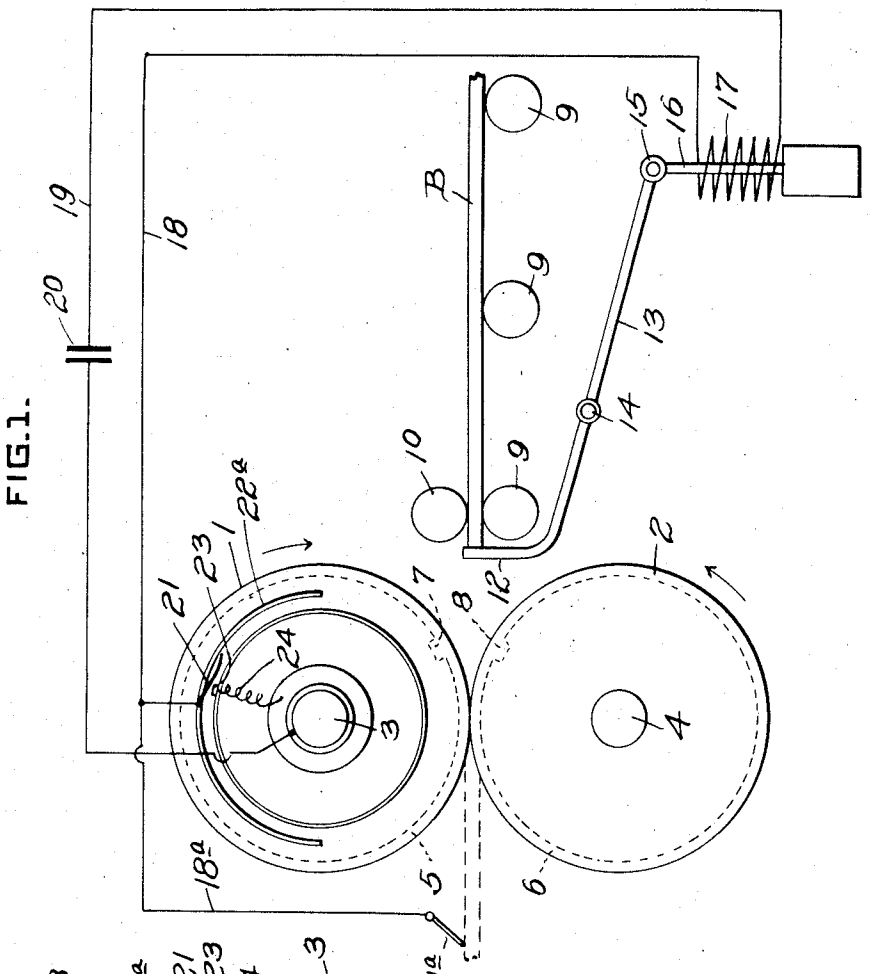
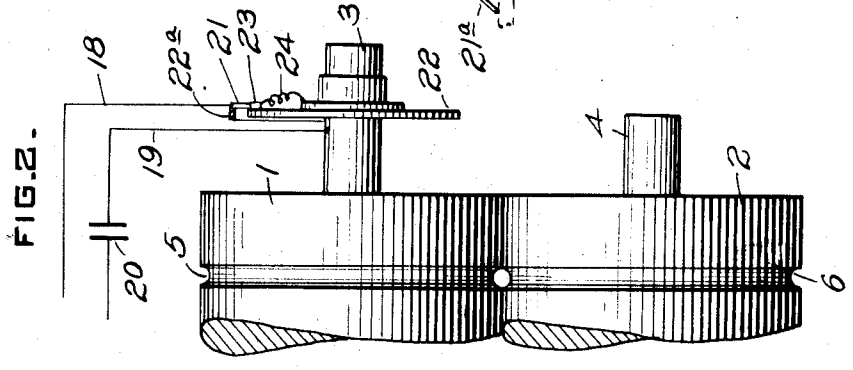


FIG. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE BAEHR, OF CORAOPOLIS, PENNSYLVANIA.

FEED-CONTROL DEVICE FOR DIE ROLLS.

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To all whom it may concern:

Be it known that I, GEORGE BAEHR, a citizen of the United States, and a resident of Coraopolis, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Feed-Control Devices for Die Rolls, of which the following is a specification.

This invention relates to rolling mills. More particularly it relates to forming or die rolling mills, and specifically it relates to feed controls for such mills.

The object of the invention is to provide a device which will secure the feeding of blanks to the forming rolls at the correct time relative to the position of the rolls, so that the front ends of the blanks will be started in the rolls at the proper time relative to the forming grooves of the rolls. Means for controlling this timed feeding device are provided, such means being actuated by the rolls themselves so that the feeding is controlled by the position of the die rolls.

Referring to the drawings, Fig. 1 is a diagrammatic view of an end elevation of a pair of die rolls, with this feeding device combined therewith, the device in this figure being electrically operated; and Fig. 2 is a diagrammatic side view at right angles to that of Fig. 1.

Die rolls, such as have come into use within the past couple of years for forming such articles as crowbars, aeroplane braces, automobile axles, railway tie-rods, etc., ordinarily have removable facing members, in which are cut channels or grooves adapted to form the hot metal into the particular shape desired. In articles of considerable length, such as automobile axles, crowbars, etc., the circumference of the roll may be approximately the same length as the article to be formed thereby,—or it may be a multiple of the lengths of the finished article. That is to say, when a blank is fed into such a roll, one or more complete axles, or other similar articles, are formed at each revolution of the roll. These blanks or billets are of suitable length and are fed in at a forging heat. The operation is in effect very nearly the same as a die forging operation.

Manifestly, when the article is of an irregular cross section, or where it has ends of a particular shape, as with an axle, or drive shaft, crowbars, etc., the end of the blank must be introduced exactly at, or a little before the beginning of the finished part that is to be rolled, and the blank must be long enough at least to reach to the other end of the forming groove, in order to complete the article being rolled. If the blank is fed too soon, the front end of it will be made into an incomplete article, and the other end of the blank may not be long enough to complete the last finished article that is commenced in the body of the billet. Thus a part of the blank may be entirely spoiled, and no useful article made therefrom. Likewise, if the blank is fed too late, the front end will not be finished as an end of a complete article, and the other end of the blank may lap over and form a part of a second uncompleted article. Therefore, it is obvious, that a very accurate feeding of such rolls is necessary in order to prevent waste of material, and to insure completeness of all the finished articles.

Referring to the drawings, in Fig. 1 a pair of rolls 1 and 2 are diagrammatically illustrated. These have integral shafts 3 and 4, which are mounted in suitable bearings, as will be readily understood. Forming grooves 5 and 6 are provided in the periphery of the rolls, and these grooves are ordinarily so shaped as to make one or more completed articles, such as automobile axles, aeroplane braces, crowbars, or the like, at each revolution of the rolls.

Between the beginning and the end of the forming groove for making such articles, in each roll there is provided a depression 7, 8. This is designed to grip the end of the hot metal blank fed to the rolls, and to start it through the rolls which thereafter in the completion of a revolution, finish one or more of the articles.

In order to insure that each blank fed to the rolls will be made into complete articles, without undue loss of metal, it is necessary that each new blank shall be fed to the die rolls so that the forward end of the blank will be gripped by the depressions 7 and 8 as they register at the point of contact of the forming rolls.

To do this, a series of driven feed rolls 9 and 10 are provided. The lower rolls 9 form in effect a supporting table, and these rolls are normally made with concave surfaces, so as to form a trough, the path of which leads directly into the forming grooves 5 and 6.

A gate member is provided having a vertical terminal 12, and a lever extension 13,

pivoted at a point 14, and having its other end pivotally connected at 15 to the core 16 of a solenoid coil 17. The coil 17 is suitably connected by wires 18 and 19 through a battery 20. The wire 19 is grounded by connection to the roll housing or bearing, and the wire 18 runs to a brush 21. A ring 22 is mounted on the end of the roll 1, and this ring carries a raised contact 23, to which is attached a wire 24, the other end of which is connected to the roll housing or bearing, to which is also connected the wire 19. The contact member 23 is adapted to be removably attached to the ring 22 at any point of its periphery, to furnish means of adjustment, as hereinafter referred to. The brush 21 which is slidably mounted on a semi-circular segment 22^a makes contact with the member 23 at each revolution of the roll, and during that contact the solenoid is operated, raising the core 16, and consequently lowering the gate, or detent 12. As soon as this contact is broken the gate member tends to drop back to the position illustrated by reason of the weight of the core 16, etc. By moving the brush on the segment 22^a adjustment of the contact is more easily made in certain positions of the rolls.

A branch 18^a may be led off the wire 18, and connected to a brush 21^a positioned to contact with the finished articles as they come from the rolls. This latter arrangement causes a closed circuit through the hot bar, rolls, and housing to wires 24 and 19, and holds the gate down as long as the brush 21^a is in contact with a bar. As soon as the billet has been run out this contact is broken, the gate raises to detaining position, and the next billet is held as illustrated until the brush 21 contacts the member 23, as above described.

The operation of the device is as follows:

A blank of hot metal B is placed upon the feed rolls 9, which are driven, and which therefore constantly urge the blank forward in a path leading directly to the forming groove in the die roll. Referring to Fig. 3 the cam 36 is so positioned upon the carrying member 35 that at the desired time the cam 36 reaches the roller 33, which necessarily rides over the cam, and thereby raises the detent 30, permitting the stock bar B to pass through the roll. The cam 36 may be circumferentially adjusted on the member 35, so that the gate will be lifted at exactly the right time relative to the revolution of the rolls. Referring to Figs. 2 and 3 the same results are effected by means of adjusting the contact member 23 upon its carrying ring. When the brush 21 contacts with the member 23 the circuit is completed and the gate 12 is moved down by means of the solenoid arrangement illustrated. This likewise permits the hot stock bar to pass through the rolls, and circumferential adjustment of the contact member 23 secures release of the hot bar at any desired time relative to the position of the rolls.

The feed rolls immediately propel the blank forward, and the removal of the detent is so adjusted that the blank reaches the groove of the die rolls at the right time for its forward end to be engaged by the registering depressions 7 and 8. Thereafter it is drawn through the rolls and formed into completed articles.

As soon as the first blank has been drawn through the rolls until its rear end passes the gate 12 that member by gravity moves into position to arrest the new blank, which is advanced at the proper time, and holds it in the position illustrated, until the depressions 7 and 8 come around on their next revolution. There is at least one or more idle revolutions of the die rolls between operations.

This mechanism, when properly adjusted, gives an accurate and positive feeding of the blanks, and prevents loss of metal through premature or tardy supplying of billets to the rolls. It is very simple in arrangement, and is a labor saving device, as well as avoiding the losses due to the failure of the operator to correctly gauge the distances and time for feeding.

The apparatus illustrated is largely diagrammatic, and it will be readily understood that many variations in form and arrangement of parts may be made without departing from the essential features of the invention.

I claim:

1. The combination with a pair of die rolls of a feed controlling device comprising a driven feed member, a detent extending across the path of the feed member, electrical means to move the detent into and out of obstructing position relative to the path of the feed member, and a make-and-break current-control operated by revolution of the die rolls, whereby to control the said detent.

2. The combination with a pair of die rolls, of a feed controlling device comprising a driven feed member, a gate extending across the path of the feed member, a solenoid adapted to control said gate, a circuit closer in the electrical circuit through the solenoid, and means connected to one of the rolls to operate the circuit closer.

3. The combination with a pair of die rolls, of a feed controlling device comprising means for urging stock towards the rolls, a detent extending across the path of the hot stock, electrical means to move the detent out of position to engage the stock, and an adjustable contact member carried by one of the rolls and adapted to control the electrical means so as to remove the detent at a predetermined position of the die rolls.

4. A feed controlling device for die rolls comprising a movable member normally extending across the path of stock fed to the rolls, electrical means to remove the restraining member, and means adjustably connected to one of the rolls for actuating said electrical means at a predetermined position of the die rolls.

5. The combination with a pair of die rolls, of a feed controlling device comprising a feeding device adapted to urge hot stock towards the rolls, a detent extending across the path of the feed member, a solenoid adapted to move the detent out of obstructing position, an electrical circuit controlling said solenoid, a brush in said circuit adapted to contact with a member adjustably positioned on one of the rolls at each revolution thereof and thereby to close the circuit through the solenoid to remove the detent from obstructing position, and another brush adapted to contact with the hot stock after it passes through the rolls and thereby to complete a circuit through the solenoid and so holding the detent out of obstructing position as long as the second brush is in contact with stock passing through the rolls.

In testimony whereof, I have hereunto set my hand.

GEORGE BAEHR.

Witness:
EDWIN O. JOHNS.