Jan. 25, 1938. P. PARCELLS 2,106,534

BENDING ROLLS MACHINE

Filed May 15, 1936 2 Sheets-Sheet 1

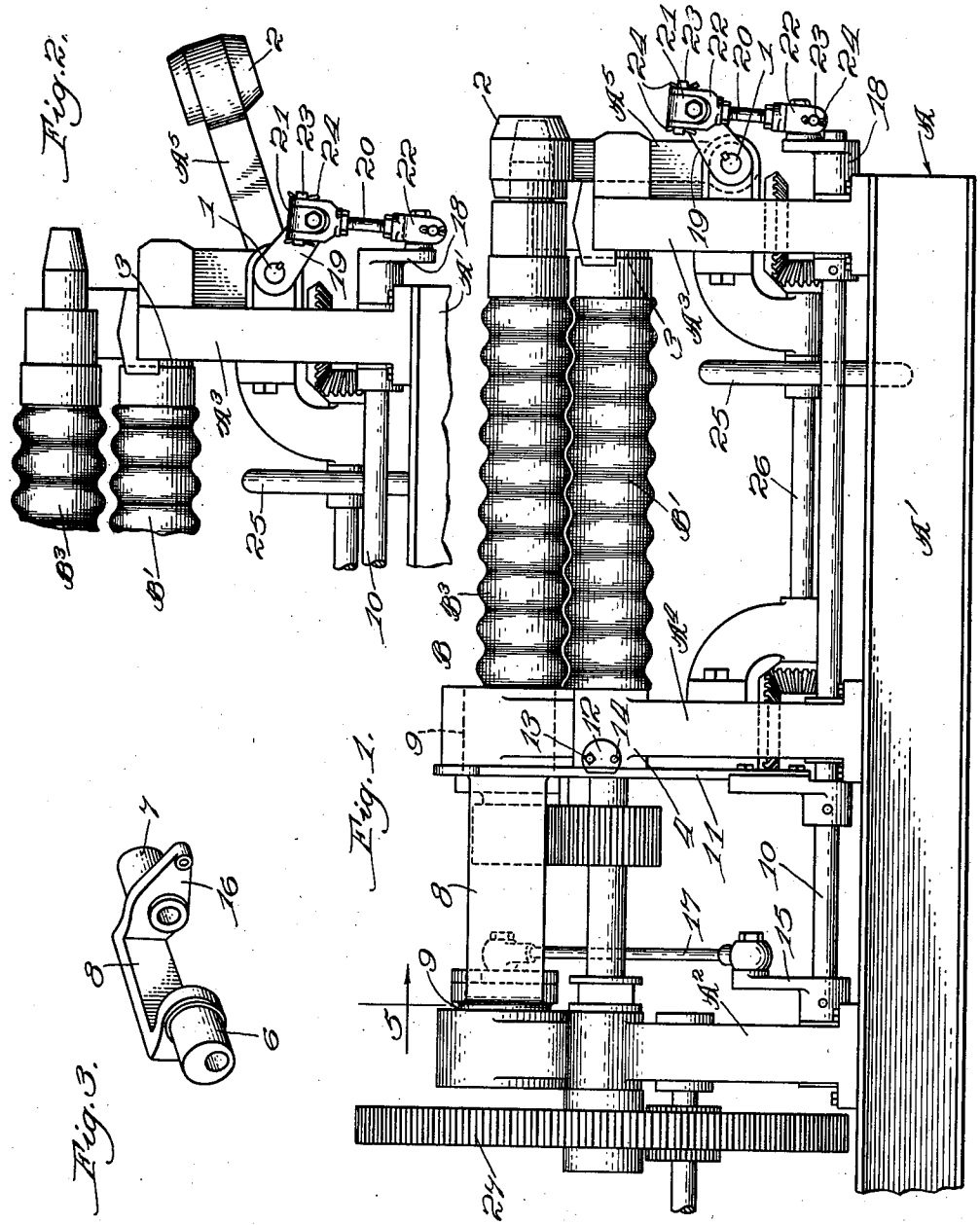

Fig. 2.

Fig. 1.

Fig. 3.

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Fig. 4.

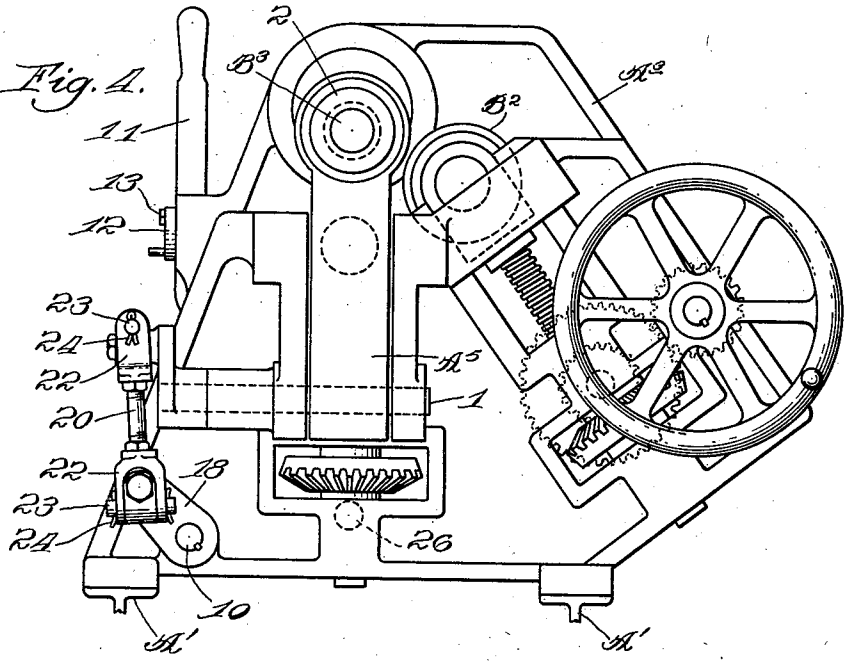
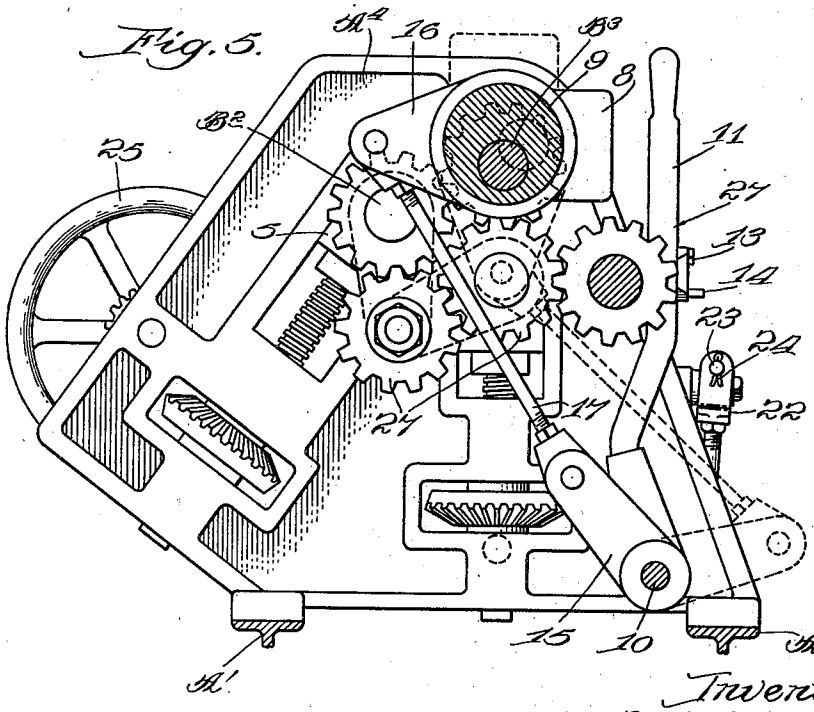


Fig. 5.



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2,106,534

BENDING ROLLS MACHINE

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Application May 15, 1936, Serial No. 79,995

4 Claims. (Cl. 153—61)

This invention relates particularly to bending rolls machines, such machines being commonly employed for forming sheet metal pipes, which may be either corrugated or non-corrugated. Sheet metal corrugated pipes are commonly employed for culvert purposes.

Machines for forming large sheet metal pipes are ordinarily of heavy construction. To enable the pipe to be removed from the roll about which the sheet metal is bent into tubular form, the bearing at one end of the roll is made withdrawable to enable the formed pipe to be slipped off the roll. It is known practice, also, to provide means for shifting from its normal position the roll about which the pipe is formed, after the bearing at one end of the roll has been withdrawn.

The primary object of the present invention is to facilitate the withdrawal and the return to normal position of the removable bearing of the rolls thus facilitating the work, in the case of heavy machines, of removing the pipe from the machine after it has been formed.

A further object of the invention is to provide mechanism for opening the bearing at one end of a vertically movable roll and counterbalancing this movement with the movement of the mechanism for raising the roll.

The present invention is an improvement on the machine shown in my Patent No. 2,049,173, granted July 28, 1936.

The invention is illustrated in the preferred embodiment in the accompanying drawings, in which—

Fig. 1 is a broken vertical longitudinal elevational view of a machine embodying the invention; Fig. 2, a fragmentary view of one end of the machine showing the bearing in open position; Fig. 3, a perspective view of the yoke which provides eccentric bearings for lifting the movable roll; Fig. 4, a broken end elevational view of the machine; and Fig. 5, a vertical sectional view taken as indicated at line 5 of Fig. 1.

In the embodiment illustrated, A designates a frame, shown as comprising longitudinal base-members A′, main end-standards A^2 and A^3, and an intermediate standard A^4, these standards being carried by the longitudinal base-members A′; A^5, a swinging-standard mounted on a transverse pivot 1 carried by the main end-standard A^3, the standard A^5 being provided in its upper end with a bearing 2; B, a set of bending-rolls suitably supported in the frame, shown as comprising a lower roll B′, a back-roll B^2, and a shiftable upper roll B^3, the latter being the roll about which the pipe is to be formed.

The roll B′ is shown journaled in bearings 3 and 4 which are vertically adjustable in the standards A^3 and A^4, respectively. The roll B^2 is mounted in adjustable bearings 5 with which the standards A^3 and A^4 are provided. The roll B^3 has its front end-portion (drive end of machine) journaled in bearings 6 and 7 forming a part of a yoke 8, the bearings being in the form of eccentrics journaled in portions 9 of the standards A^2 and A^4.

A rock shaft 10 which is journaled in the standards of the machine is provided with a hand operated lever 11 preferably disposed near the standard A^4. As shown in Figs. 1 and 4 a locking disk 12 is supported on the pivot 13. This locking-disk drops by gravity into the locking position shown in Fig. 1. It may be swung away from this position through the medium of a stud 14 to unlock the lever 11. The left end of the shaft 10, as viewed in Fig. 1, is equipped with a crank 15 which is linked to an arm 16 on the yoke 8 by means of a pitman 17. When the rolls are in normal operative position the crank is in the position shown in Fig. 5 and when swung into the position shown by the dotted lines the roll B^3 will be raised as it is journaled eccentrically in the trunnions 6 and 7. It may be noted that in its operative position the crank is slightly beyond dead center position so that the shaft 10 may rotate some distance before any appreciable lifting of the roll B^3 takes place.

At the opposite end of the shaft 10, near the standard A^3 is a crank member 18 which is linked to a crank 19, provided on the pivot 1, by means of a pitman 20 which is provided at each end with similar universal joints. Each universal joint has a block 21 journaled on the corresponding crank and is connected to a yoke member 22 by means of a pivot pin 23 provided at each end with cotter pins 24. The cranks 15 and 18 are disposed so that the movement of the yoke 8 in raising the shaft of the roll B^3 is counterbalanced by the movement of the standard A^5 swinging from the end standard A^3. As the crank 15 is slightly beyond dead center sufficient clearance is provided for the bearing 2 to open up before the roll B^3 starts to raise appreciably. Thus it will be understood that the linkage enables the operator by one movement of the lever 11 to open the bearing 2 and raise the roll B^3. As one movement counterbalances the other it is unnecessary to provide a counterbalance on the yoke 8 and no

other counterbalance is necessary for the swinging standard A^5.

A hand wheel **25** provided on a jack shaft **26** is provided to adjust the height of the roll B^2 as is well known in the art and need not be described in detail. The rolls are driven by means of suitable gearing **27** as shown in my patent referred to above, and is also well understood in the art.

The operating lever **11** is shown adjacent to the standard A^4 as this is the most convenient position for the operator who feeds the plates in between the rolls B' and B^3. However, if desired, the handle may be arranged anywhere along the shaft **10** or on the connecting linkage, as will be readily understood.

It will be understood that the grouping of the bending rolls may be as desired. It is known, for example, to locate the two lower rolls in a horizontal plane and locate the upper roll above the space between the two lower rolls.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I claim as new, and desire to secure by Letters Patent, is:

1. In combination: a machine comprising a set of bending rolls, a frame which comprises a main end-standard equipped with a swinging yoke having two trunnions mounted to rock in said frame and provided with an eccentric bearing to receive one end of one of the rolls, an outwardly and downwardly swinging pivoted standard provided with a bearing for the other end of said roll, and means comprising an oscillatable shaft provided with cranks for moving the pivoted standard bearing from engagement with the roll and moving said roll by rocking said yoke when said pivoted standard is pulled outwardly by hand.

2. In combination: a machine comprising a set of bending rolls, a frame which comprises a main end-standard equipped with a swinging yoke having two trunnions mounted to rock in said frame and provided with an eccentric bearing to receive one end of one of said rolls, an outwardly and downwardly swinging pivoted standard provided with a bearing for the other end of said roll, said standard being provided in an actuating arm, and means comprising an oscillatable shaft journaled in said frame and provided at one end with a crank linked to said yoke and provided at the other end with a crank which is linked to said actuating arm by means of a pitman provided at each end with a connecting universal joint, whereby said rolls may be separated manually by drawing the pivoted standard outwardly.

3. A device as specified in claim 2, in which the cranks are arranged so that the pivoted standard will swing outwardly before any substantial movement of the movable roll is accomplished.

4. In a machine of the character set forth: a set of bending rolls, a movable bearing for one end of one of said rolls adapted to raise and lower said roll from a companion roll, an outwardly and downwardly swinging pivoted standard provided with a bearing for the opposite end of the movable roll, and connections between said pivotal standard and movable bearing for counterbalancing the movement of one against the other comprising an oscillatable rock shaft provided with cranks linked to operating arms provided on the movable bearing and on the swinging standard, said rock shaft being oscillatable by means of a hand lever mounted thereon, and said cranks being angularly disposed on the rock shaft so as to swing beyond the dead center of said rock shaft after lowering the roll whereby the roll is locked in operative position.

PAUL PARCELLS.