Nov. 14, 1939. J. R. FREEZE 2,179,849

TURRET TYPE ROLL FORMING-MACHINE

Filed March 14, 1938 3 Sheets-Sheet 1

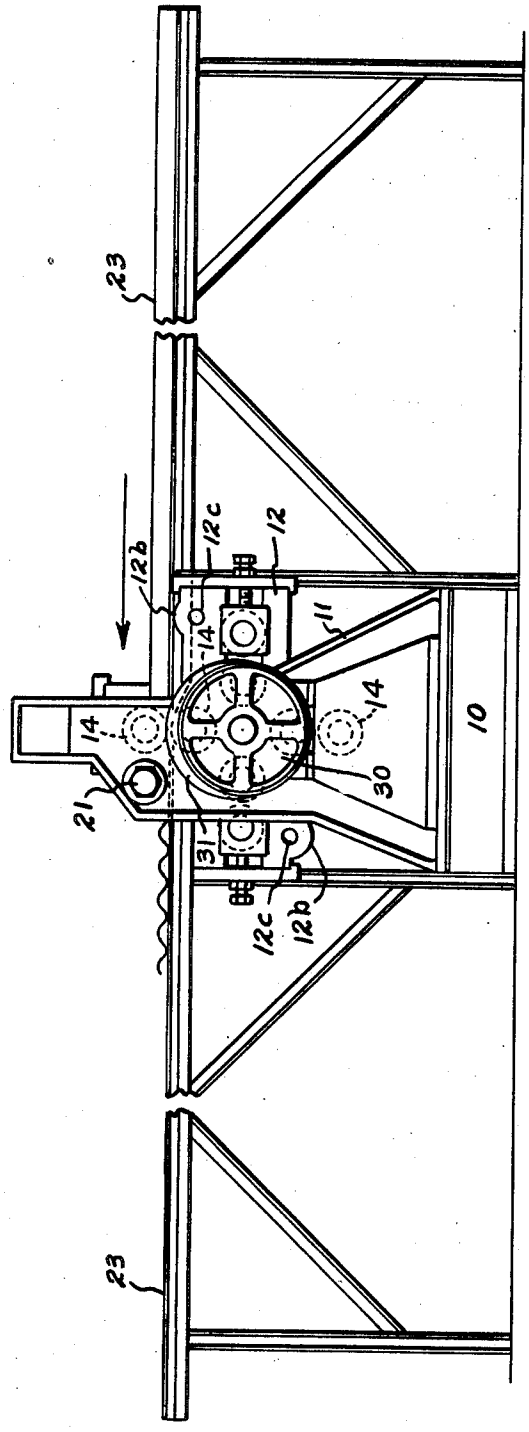


FIG. 1.



FIG. 5.



FIG. 4.

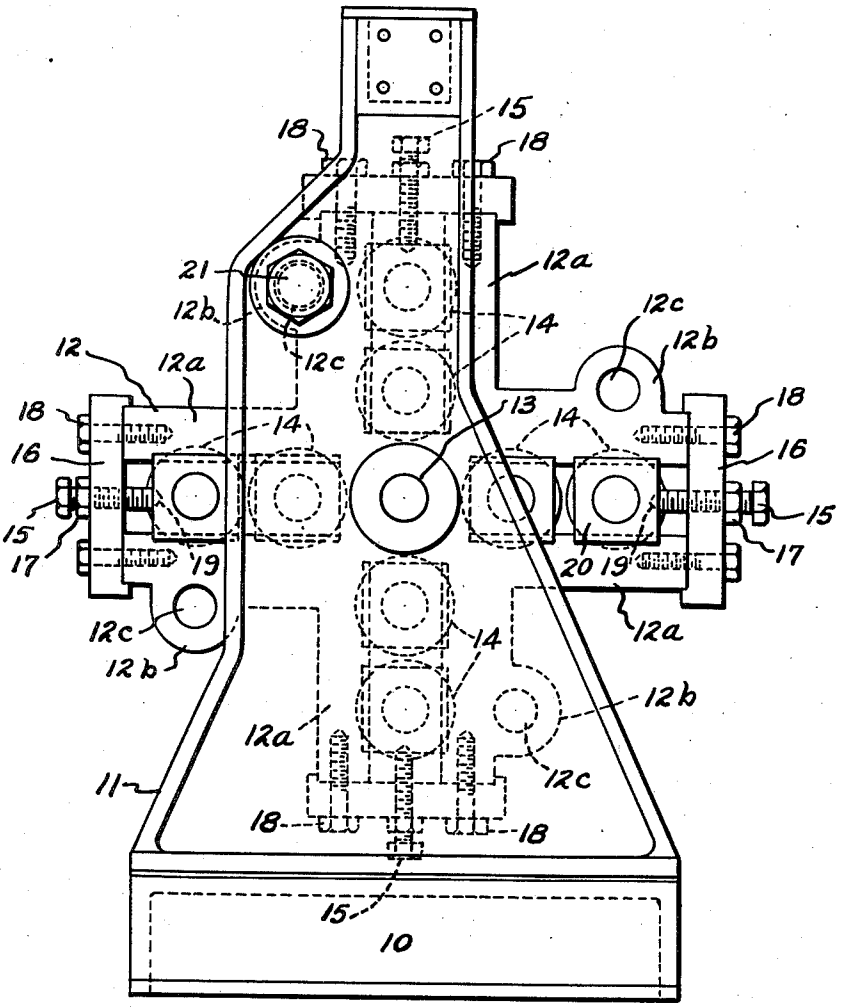
INVENTOR
JONATHAN ROY FREEZE
BY Allen & Allen
ATTORNEYS.

Nov. 14, 1939. J. R. FREEZE 2,179,849

TURRET TYPE ROLL FORMING-MACHINE

Filed March 14, 1938 3 Sheets-Sheet 2

FIG. 2.



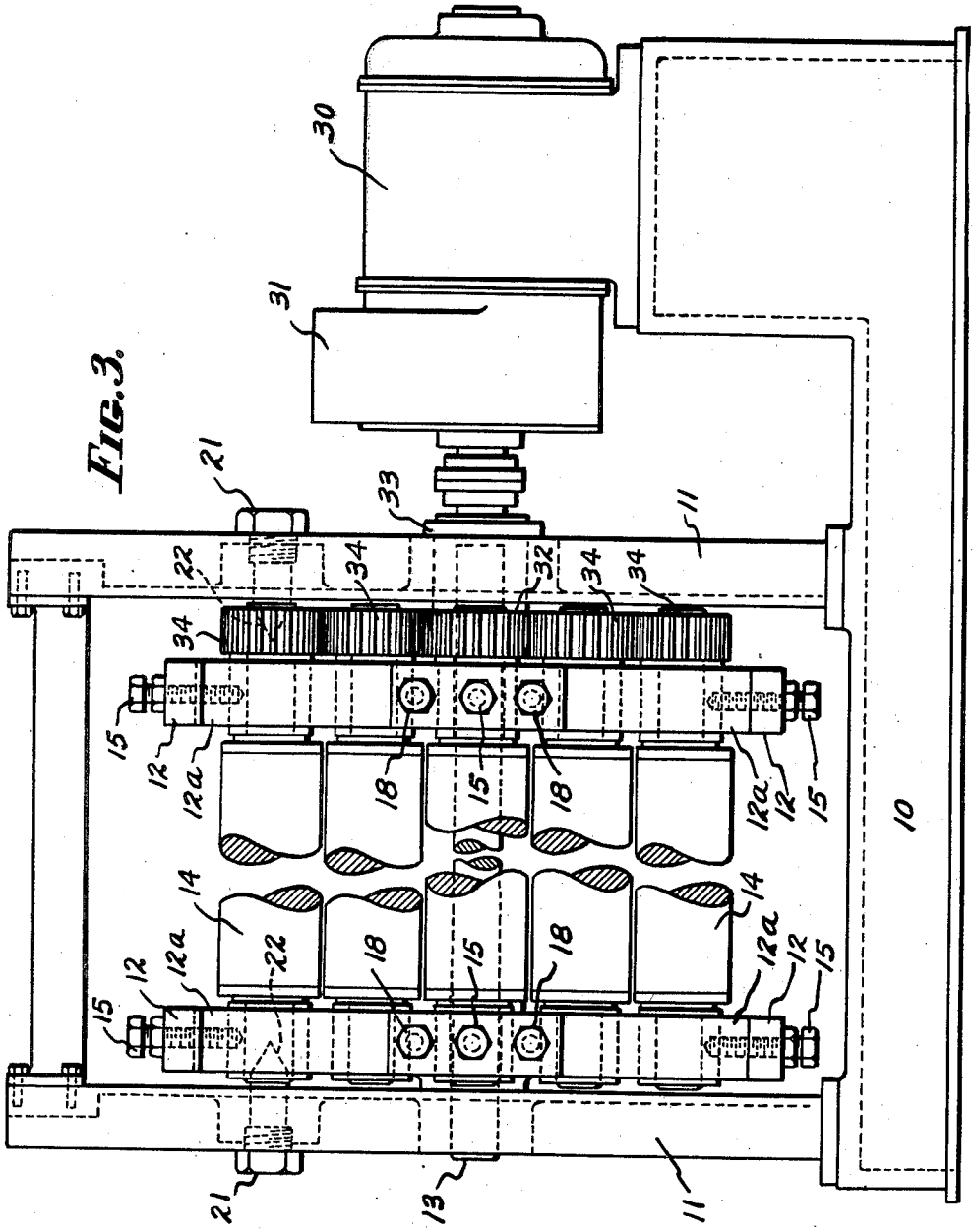
INVENTOR
JONATHAN ROY FREEZE.
BY Allen & Allen
ATTORNEYS.

Nov. 14, 1939. J. R. FREEZE 2,179,849

TURRET TYPE ROLL FORMING-MACHINE

Filed March 14, 1938 3 Sheets-Sheet 3

Fig. 3.



INVENTOR
JONATHAN ROY FREEZE.
BY Allen & Allen
ATTORNEYS.

Patented Nov. 14, 1939 2,179,849

UNITED STATES PATENT OFFICE

2,179,849

TURRET TYPE ROLL FORMING-MACHINE

Jonathan Roy Freeze, Middletown, Ohio, assignor to The American Rolling Mill Company, Middletown, Ohio, a corporation of Ohio

Application March 14, 1938, Serial No. 195,830

4 Claims. (Cl. 153—77)

This invention relates to what are known in the trade as roll forming-machines which generally comprise a pair of rolls having similar configurations for the purpose of imparting to a strip of metal passing therethrough a certain transverse configuration. These machines are generally used in the manufacture of corrugated roofing and siding from flat sheets.

In the manufacture of such products a great variety of configurations are used and every time it is desired to change the machine from a set up for manufacturing simple corrugated sheets to a set up for manufacturing sheets having angular corrugations, it is necessary to change the rolls in the machine.

With the above considerations in mind, it is an object of my invention to provide a roll forming-machine of the turret type. It is an object of my inventtion to provide a machine which will have mounted on a rotatable member a plurality of pairs of forming rolls each of different configuration so that a variety of different products may be made by simply rotating the turret to bring a different pair of rolls into operation position. It is an object of my invention to provide means for locking the turret in its various operative positions, and another object of my invention includes the provision of driving means for the respective pairs of rolls.

These and other objects of my invention which will be clear to one skilled in the art upon reading these specifications or which will be pointed out more in detail hereinafter, I accomplish by that certain construction and arrangement of parts of which I shall now describe an exemplary embodiment.

Reference is now made to the drawings forming a part hereof and in which:

Figure 1 is a side elevation of the machine looking at the drive end thereof and showing the feed tables in position.

Fig. 2 is an end view of the machine looking at the end opposite the drive.

Fig. 3 is a side elevation of the machine showing the driving arrangement and the locking devices.

Fig. 4 is an end view of an exemplary product manufactured with one pair of rolls in the machine.

Fig. 5 is an end view of another exemplary product made with a different pair of rolls.

Briefly, in the practice of my invention, I provide a base 10 upon which there are two standards 11. A pair of roll heads or spiders 12 are rotatably mounted upon a shaft 13 journaled in the standards 11. Extending between the respective arms of the spiders 12 are the various forming rolls 14 which are disposed in pairs. These rolls are mounted in windows in the arms 12*a* of the spiders 12 in any well known manner, and screw down means for the outer of each pair of rolls are provided by means of screws 15 threaded in the cross heads 12 of the spider arms 12*a* and provided with the lock nuts 17. The cross heads 16 may be screwed or bolted to the spider arms 12*a*, as generally indicated at 18. The ends of the screws 15 are conical as shown at 19, and have their bearing in conical recesses in the roll bearing blocks 20. By these means it will be clear that the spacing for the roll pass between any pair of rolls 14 may be adjusted.

The respective spider arms 12*a* are provided with lugs 12*b* having the bores 12*c*. In each of the standards 11 is provided a screw 21 which is threaded into the standards 11 and which has a conical point 22. The spiders 12 may be accurately indexed by this arrangement. It will be understood that when it is desired to change the machine for a different pair of rolls, it is only necessary to withdraw or retract the screws 21, rotate the spiders 12 and then reinsert the screws 21 into the appropriate bores 12*c* as before. As is generally indicated in Fig. 1 the machine is provided with feed tables 23 and from this figure it will be clear that the pair of rolls which is uppermost will be the pair of rolls for a given operation. The height of the feed tables 23 is such that a sheet running along either of the tables 23 will be at the proper elevation to enter the pass between the uppermost pair of rolls 14. The rolls themselves may be of any desired configuration so as to permit of the roll forming of such cross sections as shown in Figs. 4 and 5.

For the purpose of driving the rolls I have indicated in Fig. 3 a motor 30 and speed reducer 31, arranged to drive a gear 32 through a thimble bearing 33. This type of bearing is conventional and has been shown in the drawings more or less diagrammatically. It will be understood that the drive is to the gear 32 and that the shaft 13 is not rotated. On the shaft of each roll 14 there is a gear 34, the gears of each pair of shafts being arranged to be in intermeshing relation and the inner gear 34 being arranged to mesh wtih the central gear 32. It will thus be seen that all sets of rolls will be driven at the same time by the motor 30. This arrangement is entirely satisfactory in connection with the manufacturing of light gauge material. When heavier gauges of material are being manufactured it

is preferable to have all the rolls disengaged except that pair which is in the uppermost or operative position. This may readily be accomplished on the illustrated machine by simply backing out the three pairs of rolls which are not in operation by means of their respective screw downs 15. When the three outer rolls are withdrawn the inner rolls may simply be slid outwardly to a point where their gears 34 are no longer in meshing relation with the central gear 32.

It will be understood that various modifications may be made without departing from the spirit of my invention. For example, in connection with extremely heavy work, it may be advisable to drive both rolls of the operating pair, and it is within the scope of my invention to drive the two rolls in operation independently through universal joints and a dual drive driven by the motor reducer. It is to be understood that I do not intend to limit myself otherwise than as pointed out in the claims which follow.

Having now fully described my invention, what I believe to be new and desire to secure by Letters Patent, is:

1. In a roll forming-machine comprising a base, a pair of standards on said base, a pair of spiders coaxially and rotatably mounted, respectively, on said standards, and means for locking said spiders in any one of a number of positions; pairs of forming rolls rotatably mounted between the respective arms of said spiders, a gear mounted coaxially with said spiders, gears in driving relation with the several rolls, the gears of each pair of rolls being in intermeshing relation, and the gears of the respective inner rolls being in intermeshing relation with said coaxially mounted gear, and driving means for said last named gear.

2. A roll forming-machine comprising a base, a pair of standards on said base, a pair of spiders coaxially and rotatably mounted, respectively, on said standards, pairs of forming rolls rotatably mounted between the respective arms of said spiders, a gear mounted coaxially with said spiders, gears in driving relation with the several rolls, the gears of each pair of rolls being in intermeshing relation, and the gears of the respective inner rolls being in intermeshing relation with said coaxially mounted gear, driving means for said last mentioned gear, apertured lugs on said spider arms, and retractable studs in said standards adapted to enter said apertures for locking said spiders with any pair of said forming rolls in operative position.

3. A roll forming-machine for modifying the transverse cross section of a strip of metal or the like, comprising a base, a pair of standards on said base, a pair of roll heads rotatably mounted in said standards, a plurality of pairs of forming rolls rotatably mounted between said roll heads, driving means for said respective pairs of rolls, individual screw-down devices for each of said pairs of rolls, and means for locking said roll heads with any pair of said rolls in operative position, said locking means comprising retractable studs in said standards, and a number of apertures in said roll heads equal in number to the number of pairs of rolls, said studs entering said apertures for locking.

4. A roll forming-machine comprising a base, a pair of standards on said base, a pair of spiders coaxially and rotatably mounted, respectively, on said standards, pairs of forming rolls rotatably mounted between the respective arms of said spiders, individual screw-down devices for each of said pairs of rolls, a gear mounted coaxially with said spiders, gears in driving relation with the several rolls, the gears of each pair of rolls being in intermeshing relation, and the gears of the respective inner rolls being in intermeshing relation with said coaxially mounted gear, driving means for said last mentioned gear, apertured lugs on said spider arms, and retractable studs in said standards adapted to enter said apertures for locking said spiders with any pair of said forming rolls in operative position.

JONATHAN ROY FREEZE.