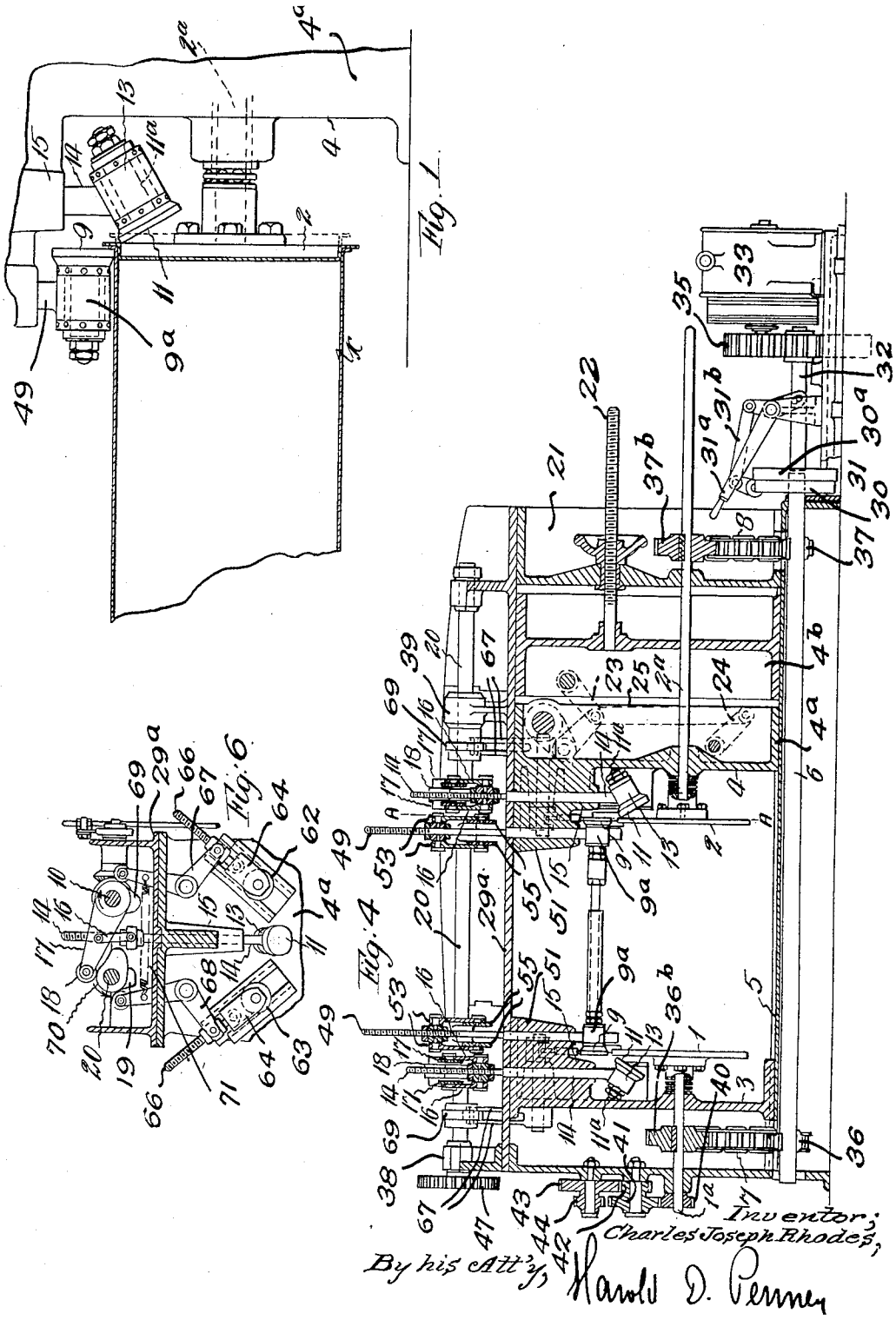
June 23, 1931. C. J. RHODES 1,811,405

APPARATUS FOR ATTACHING THE HEADS OF SHEET METAL RECEPTACLES

Filed Jan. 10, 1929 4 Sheets-Sheet 1



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APPARATUS FOR ATTACHING THE HEADS OF SHEET METAL RECEPTACLES

Filed Jan. 10, 1929 4 Sheets-Sheet 2

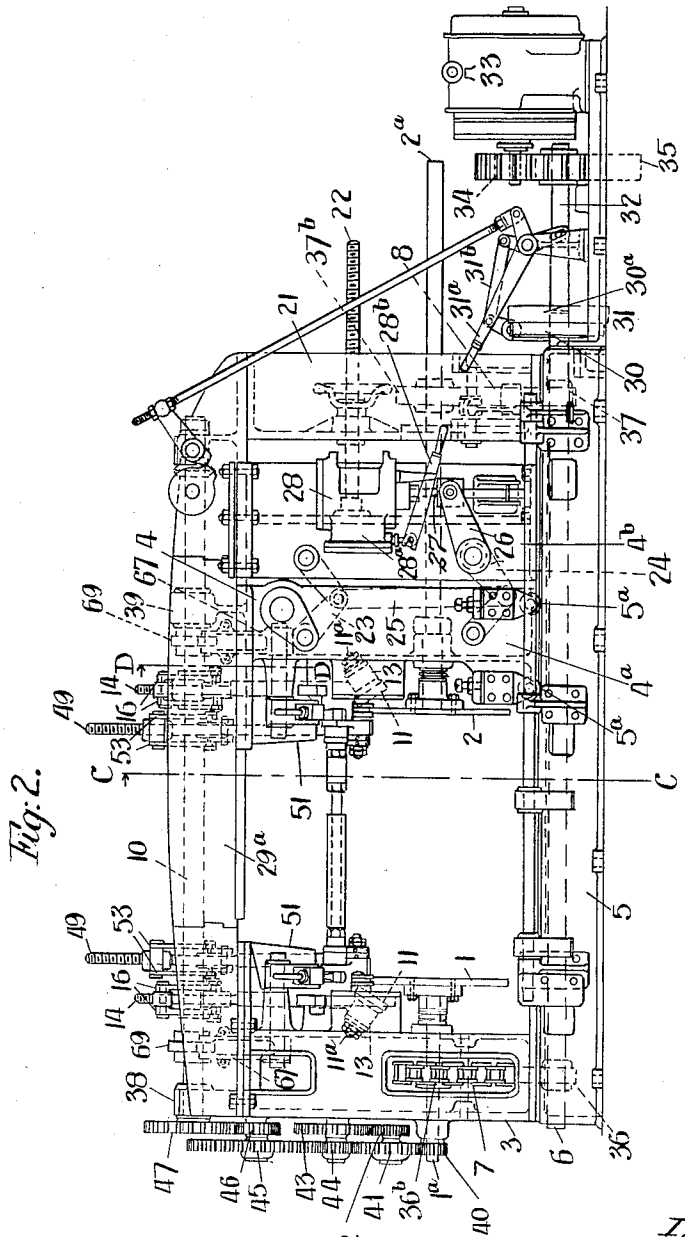


Fig. 2.

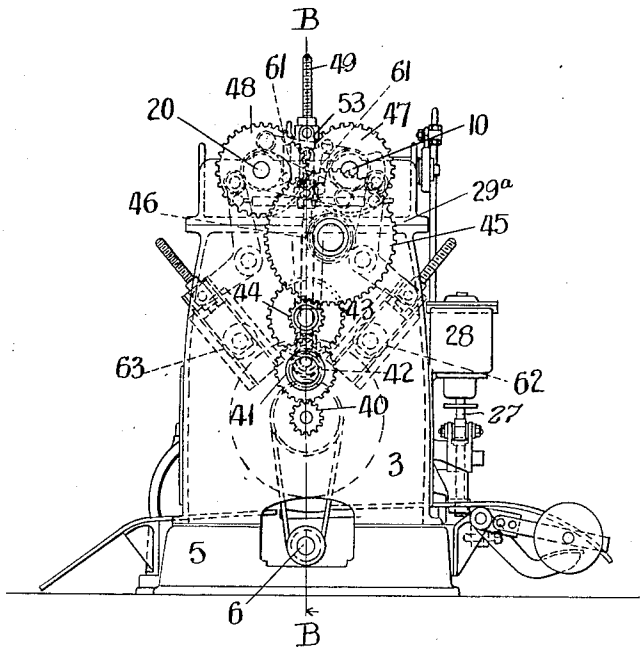
Inventor;
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By his Att'y,
Harold D. Penney

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APPARATUS FOR ATTACHING THE HEADS OF SHEET METAL RECEPTACLES

Filed Jan. 10, 1929 4 Sheets-Sheet 3

Fig: 3.



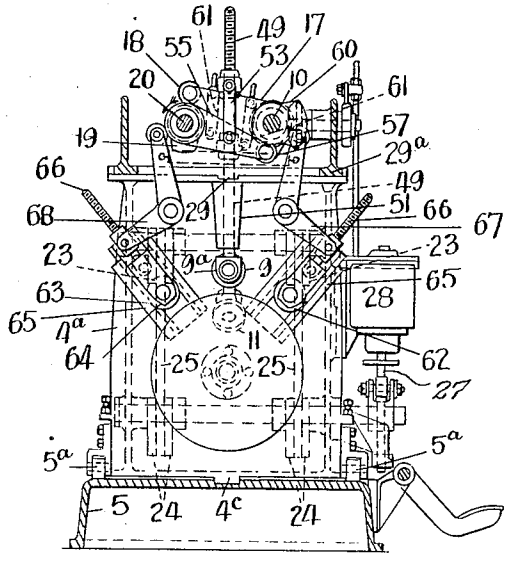


Fig: 5.

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June 23, 1931. C. J. RHODES 1,811,405

APPARATUS FOR ATTACHING THE HEADS OF SHEET METAL RECEPTACLES

Filed Jan. 10, 1929 4 Sheets-Sheet 4

Fig. 7.

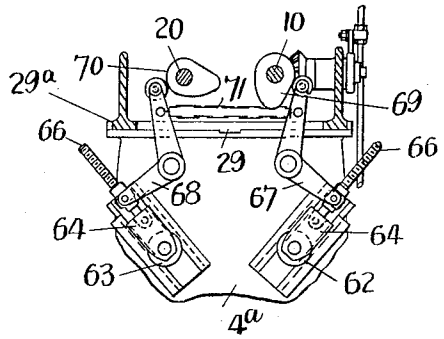
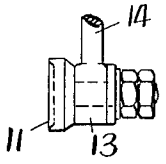


Fig. 9.



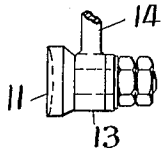
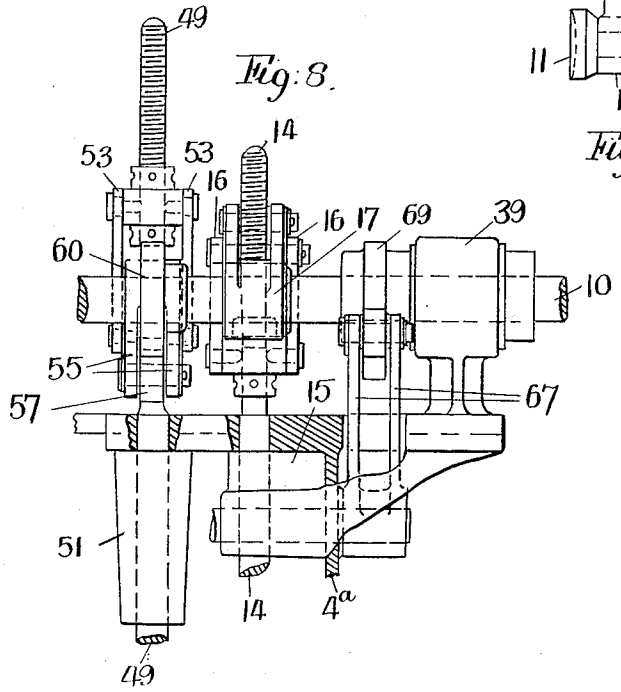


Fig. 10.

Fig. 8.



Inventor;
Charles Joseph Rhodes,
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Patented June 23, 1931

1,811,405

UNITED STATES PATENT OFFICE

CHARLES JOSEPH RHODES, OF WAKEFIELD, ENGLAND

APPARATUS FOR ATTACHING THE HEADS OF SHEET METAL RECEPTACLES

Application filed January 10, 1929, Serial No. 331,452, and in Great Britain October 2, 1928.

The present invention relates to improvements in apparatus for attaching the heads of sheet metal receptacles, and relates more particulary to that type of flanging and seaming machine of which that described in British specification No. 288684 is an example, and which includes two headstocks or the like provided with axially aligned chucks or the like between which the work is held and rotated whilst it is acted upon by various rollers, by which the flanging and seaming operatings are successively performed, the various rollers being operated by means of cams or the like.

In flanging and seaming machines as heretofore constructed it has been the practice to so arrange the flanging roller or rollers that when the same is or are in the operative position the area of contact between the said roller or rollers and the work is comparatively large, and consequently owing to the friction a large amount of heat is generated which has a tendency to cause defective flanges and leaky drums.

According to the present invention it is proposed to obviate these disadvantages by so arranging the flanging rollers that when the same are in operation the area of contact between the same and the work is reduced to a minimum.

In accordance with one form of the present invention the flanging rollers are so disposed that their axes of rotation are inclined with respect to the plane of bodily displacement of the said rollers when the same are moved to affect the flanging operation, whereby the area of contact between the said rollers and the work during the main portion of the flanging operation is maintained at a minimum.

In order that the invention may be the better understood drawings are appended in which:

Fig. 1 is a fragmentary view of part of a flanging and seaming machine embodying the present invention.

Fig. 2 is a side elevation of a complete machine embodying the present invention.

Fig. 3 is a view of the machine as seen from the left hand end.

Fig. 4 is a longitudinal section on line B—B Fig. 3.

Fig. 5 is a transverse section on line C—C Fig. 2.

Fig. 6 is a sectional view on line A—A Fig. 4.

Fig. 7 is a similar view on line D—D Fig. 2.

Fig. 8 is a part sectional view showing certain details.

Figs. 9 and 10 are views showing modified forms of flanging rollers.

Referring to the accompanying drawings 1 and 2 indicate rotating chuck plates carried upon shafts 1^a, and 2^a respectively. The shaft 1^a is journalled in bearings formed in the walls of a hollow standard or headstock 3 bolted to one end of a hollow bed 5 to the other end of which is bolted a standard 21.

4 indicates generally a second headstock normally disposed adjacent the inner face of the standard 21 and formed in two parts 4^a, and 4^b, the part 4^b being connected to the standard 21 by means of a screwed spindle 22 which, at its inner end is secured to the part 4^b, whilst at its outer end it projects through the wall of the standard 21, and is provided with a hand wheel whereby the position of the part 4^b may be varied with respect to the standard 21.

The shaft 2^a is journalled in bearings formed in the inner wall of the parts 4^a and its outer end projects some distance beyond the end of the bed 5. The part 4^a which is disposed adjacent the inner face of the part 4^b, is movably mounted upon the bed 5 by means of rollers 5^a, and is connected to the part 4^b by means of upper and lower toggle levers indicated respectively by 23, 24, the said toggle levers being connected together by means of a link 25.

The lower toggle lever 24 is operably connected by means of a lever 26 to a piston rod 27 connected to a piston operating within a cylinder 28 to which compressed air or any other fluid or liquid, may be admitted to either end, by means of a two way valve 28^a operable by means of a hand lever 28^b, whereby the part 4^a may be moved to or away from the part 4^a.

The parts 4^a and 4^b, are provided upon their undersides with tongues such as 4^c (Fig. 5) which engage with a longitudinal groove formed within the upper surface of the bed 5, whilst the upper surfaces of the parts 4^a and 4^b are provided with grooves which engage a tongue 29 formed upon the underside of a horizontally disposed girder 29^a forming a capping member which extends between the standards 3 and 21, and to the upper ends of which standards, the ends of the said girder are bolted. The above mentioned tongues and grooves serve to form rigid guides for the tailstock 4, along which it is moved.

The main drive shaft, which is indicated by 6, is disposed within the bed 5 and extends longitudinally thereof, being carried in suitable bearings formed upon the inner portion of the said bed.

The shaft 6, which extends at one end somewhat beyond the outside of the bed 5, is provided with a clutch member 30 forming part of a friction clutch indicated generally by 31, the said clutch member cooperating with the member 30^a also forming part of the said clutch and secured upon a shaft 32 driven from a motor 33 by means of pinions 34, 35, secured respectively upon the motor shaft and the said shaft 32.

31^a indicates a hand lever operably connected by means of an articulated link 31^b to the clutch 31. Secured upon the shaft 6 are sprockets 36, 37, from which motion is transmitted by means of chains 7, and 8, to sprockets 36^b, 37^b secured upon the shafts 1^a and 2^a respectively, whereby motion is imparted to the chucks 1 and 2, the sprocket 37^b being splined upon the shaft 2^a to permit of the movement of the headstock 4 and chuck 2.

20, 10 indicate shafts extending longitudinally of the machine and carried by means of bearings 38, 39 secured to the girder 29^a, the said shafts being disposed above the chucks 1 and 2, and upon each side of the axis of rotation of the same.

Secured upon the outer end of the shaft 1^a is a pinion 40 from which motion is imparted through a train of gears 41 to 46, to a pinion 47 secured upon shaft 10 and engaging a similar pinion 48 upon shaft 20, whereby the shafts 10 and 20 are driven in opposite directions.

9, 9 indicate supporting rollers mounted to rotate in heads 9^a and which heads are carried at the lower ends of vertically disposed rods 49, moving in guides 51, forming part of the headstocks 3 and 4, and which guides are located at the upper ends of the said headstocks, the upper ends of the said rods projecting through the girder 29^a.

11, 11 indicate flanging rollers mounted upon sindles 11^a, 11^a, journalled in bearings 13, 13 formed at the lower ends of rods 14, 14 carried in guides 15, 15 formed in the headstocks 3 and 4.

The rods 14, 14 are connected at their upper ends by means of links 16, 16 to levers 17, 17 each pivotally mounted at one end upon the shaft 10, and provided at their outer ends with rollers 18, 18 which engage with cams 19, 19, mounted upon the shaft 20 and arranged to effect the raising and lowering of the flanging rollers during the flanging operation.

The aforementioned rods 49, are at their upper ends connected by double links 53 to double armed levers 55.

Each of the levers 55 is pivotally mounted at one end to the shaft 20 and carries at its other end a roller 57 which is acted upon by a cam 60 mounted upon the shaft 10, and which cams are so arranged as to cause the supporting rollers 9 to move downward to support the container upon the chucks 1 and 2, whilst the aforementioned cams 19 are so arranged that immediately the rollers 9 have been brought into action, the flanging rollers 11 are raised into the operative position.

In order to maintain the levers 55 in such a position that the rollers 57 are retained in contact with the cams 60, springs such as 61, are connected at their lower ends to the levers 55, and at their upper ends to any suitable portion of the machine frame, thereby tending to lift the levers 55.

Upon reference to the drawings it will be seen that the flanging rollers are so arranged that their axes of rotation are inclined with respect to their planes of bodily displacement when in operation, whereby neither the inner faces of the said rollers nor the edges at right angles to said faces are in contact with the work throughout the flanging operation, but the main portion of the flanging operation is effected by the inner edges of the rollers.

In the position in which the flanging roller is shown in Fig. 1 it has just completed the flanging operation upon the drum indicated by x and is moving downwardly into its initial position.

62, 62 and 63, 63 indicate curling and flattening rollers respectively, which are disposed in close proximity with each chuck plate and which are brought into operation after the supporting and flanging rollers have completed their respective functions and have returned to their normal positions.

Each of the curling and flattening rollers 62, 63 is mounted within a body 64 carried in inclined guides 65 which converge in a downward direction toward the central axes of the machine and which guides are in this case, disposed upon the headstocks 3 and 4, at points somewhat above the central axis of the machine, the arrangement being such

that the rollers 62, 63 may be moved downwardly into their operative positions.

The bodies 64 are provided at their upper ends with rods 66 connected at their upper ends to the lower ends of bell crank levers 67, 68 carried upon the headstocks 3 and 4 and provided at their upper ends with rollers which are acted upon by cams 69, 70 (Fig. 7), which act respectively to cause the operation of the curling rollers 62 and flattening rollers 63.

In order to cause the rollers upon the upper ends of the bell crank levers 67, 68 to be retained in contact with the cams 69, 70, springs such as 71 are provided, extending between the upper limbs of the said bell-crank levers and tending to draw these limbs inward.

It will, of course, be readily appreciated that the flanging rollers need not necessarily be arranged as above described, but may be arranged with their inner faces disposed in a plane parallel with their plane of bodily displacement during the flanging operation, the said rollers being provided upon their inner faces with annular ribs such as shown in Fig. 9 and which ribs contact with the work to effect the flanging operation, or the inner surfaces of the rollers may be dished as shown in Fig. 10.

Claims:

1. Apparatus for attaching the heads to sheet metal receptacles comprising two headstocks, axially aligned chucks supported by said headstocks, between which the work is held, means for rotating said chucks, a supporting roller, a flanging roller cooperating with said supporting roller so constructed and arranged that it presents a minimum surface of contact with the work throughout the flanging operation and other rollers for completing the attachment of the head to said receptacles.

2. Apparatus for attaching the heads to sheet metal receptacles comprising a fixed headstock, a movable headstock, axially aligned chucks supported by said headstocks between which the work is held, means for rotating said chucks, means embodying a system of toggle levers for operating the movable headstock to cause the chuck carried thereby to engage the work and to free same, a supporting roller, a flanging roller cooperating with said supporting roller so constructed and arranged that it presents a minimum surface of contact with the work throughout the flanging operation and other rollers for completing the attachment of the head to said receptacles.

3. Apparatus for attaching the heads to sheet metal receptacles comprising a fixed headstock, a movable headstock, axially aligned chucks supported by said headstocks between which the work is held, means for rotating said chucks, means embodying a system of toggle levers for operating the movable headstock to cause the chuck carried thereby to engage the work and to free same, a supporting roller, a flanging roller cooperating with said supporting roller, so constructed and arranged that it presents a minimum surface of contact with the work throughout the flanging operation, means for moving the supporting roller in one direction to engage the work, means for moving the flanging roller in another direction to engage the work, a curling roller, means for moving said roller into and out of contact with the work, a flattening roller, means to move said flattening roller into and out of contact with the work.

4. Apparatus for attaching the heads to sheet metal receptacles comprising a fixed headstock, a movable headstock, axially aligned chucks supported by said headstocks between which the work is held, means for rotating said chucks, means embodying a system of toggle levers for operating the movable headstock to cause the chuck carried thereby to engage the work and to free same, a supporting roller, a flanging roller cooperating with said supporting roller, so constructed and arranged that it presents a minimum surface of contact with the work throughout the flanging operation, means for moving the supporting roller in one direction to engage the work, means for moving the flanging roller in another direction to engage the work, a curling roller, means for moving said roller into and out of contact with the work, a flattening roller, means to move said flattening roller into and out of contact with the work, the various rollers being disposed above the horizontal axis of the chucks.

5. Apparatus for attaching the heads to sheet metal receptacles comprising two headstocks, axially aligned chucks supported by said headstocks, between which the work is held, means for rotating said chucks, a supporting roller, a flanging roller cooperating with said supporting roller, said flanging roller having its axis of rotation inclined to the axis of rotation of the receptacle whereby it presents a minimum surface of contact with the work throughout the flanging operation and other rollers for completing the attachment of the head to said receptacles.

6. Apparatus for attaching the heads to sheet metal receptacles comprising two headstocks, axially aligned chucks supported by said headstocks, between which the work is held, means for rotating said chucks, a supporting roller, a flanging roller cooperating with said supporting roller and having its axis of rotation arranged parallel with the axis of rotation of the receptacle, and being provided with an annular rib of such shape and so arranged that there is presented a

minimum surface of contact with the work throughout the flanging operation, together with the other rollers for completing the attachment of the head of said receptacles.

7. Apparatus for attaching the heads to sheet metal receptacles comprising two headstocks, axially aligned chucks supported by said headstocks, between which the work is held, means for rotating said chucks, a supporting roller, a flanging roller cooperating with said supporting roller, said flanging roller being arranged with its axis of rotation parallel with the axis of rotation of the receptacle, and having its inner face dished whereby it presents a minimum surface of contact with the work throughout the flanging operation, and other rollers for completing the attachment of the head to said receptacles.

In testimony whereof I have hereunto set my hand.

CHARLES JOSEPH RHODES.