No. 745,665. PATENTED DEC. 1, 1903.

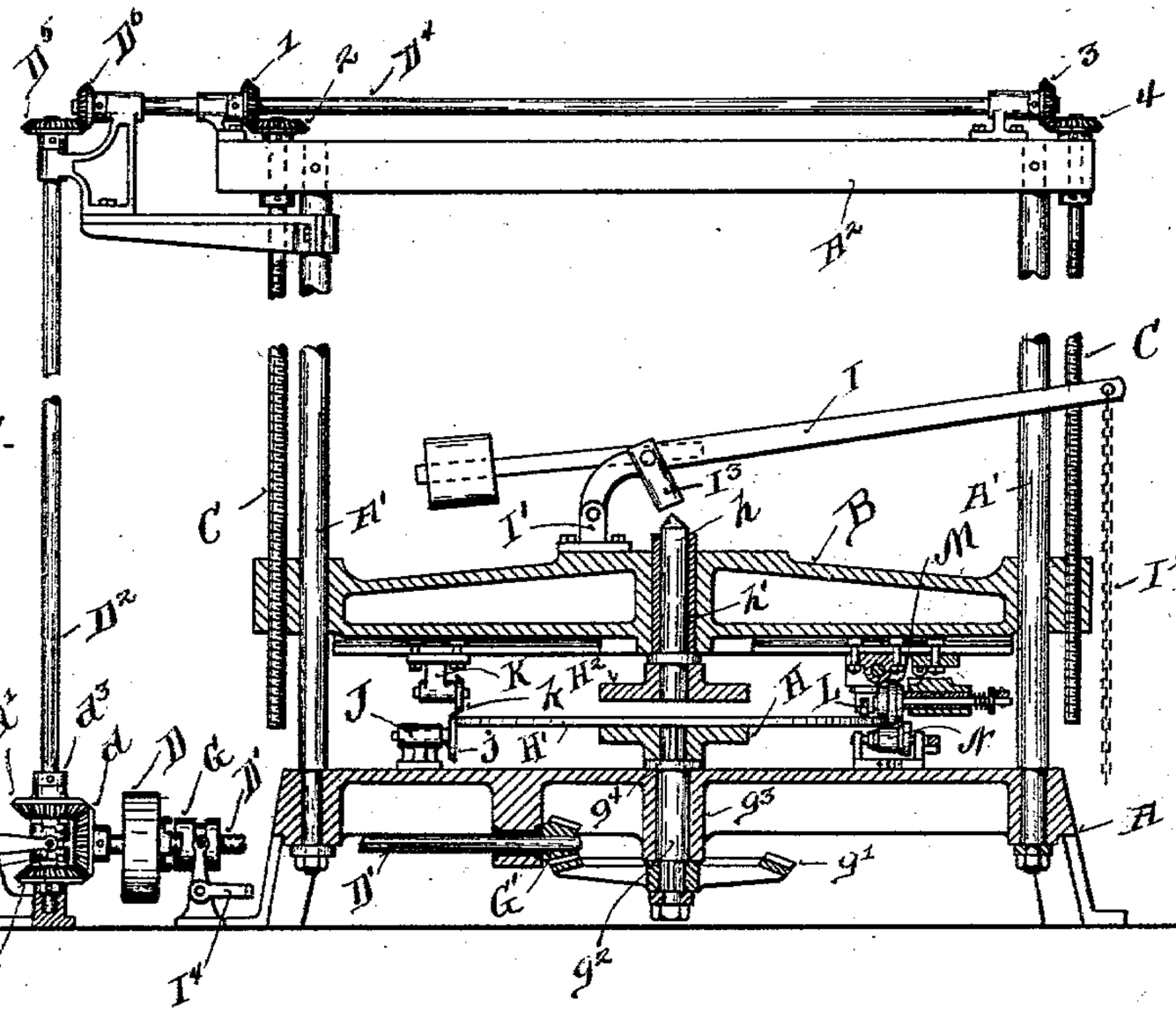
T. REIS.

METAL FLANGING MACHINE.

APPLICATION FILED JUNE 12, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



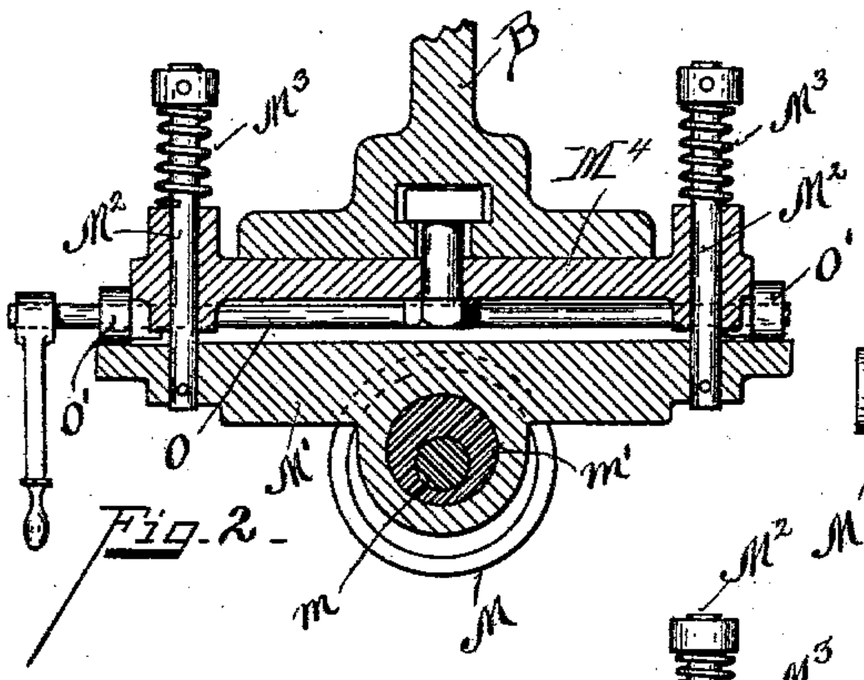


Fig. 2.

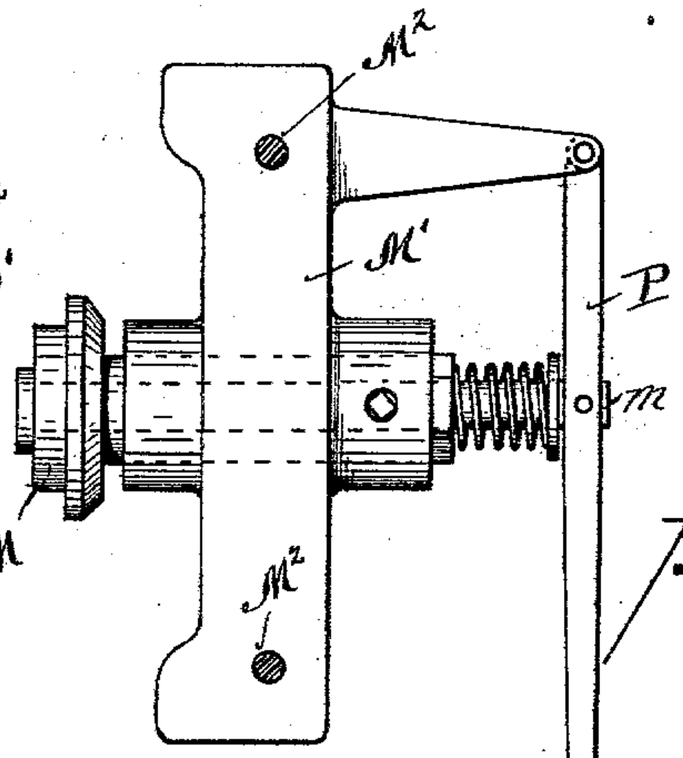


Fig. 3.

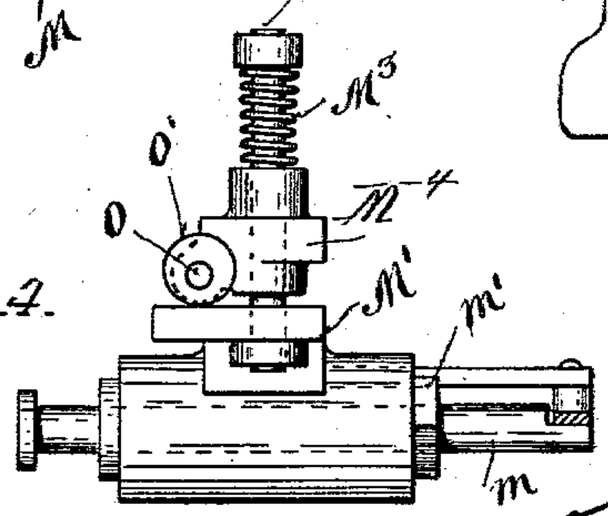


Fig. 4.

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NO MODEL. 2 SHEETS—SHEET 2.

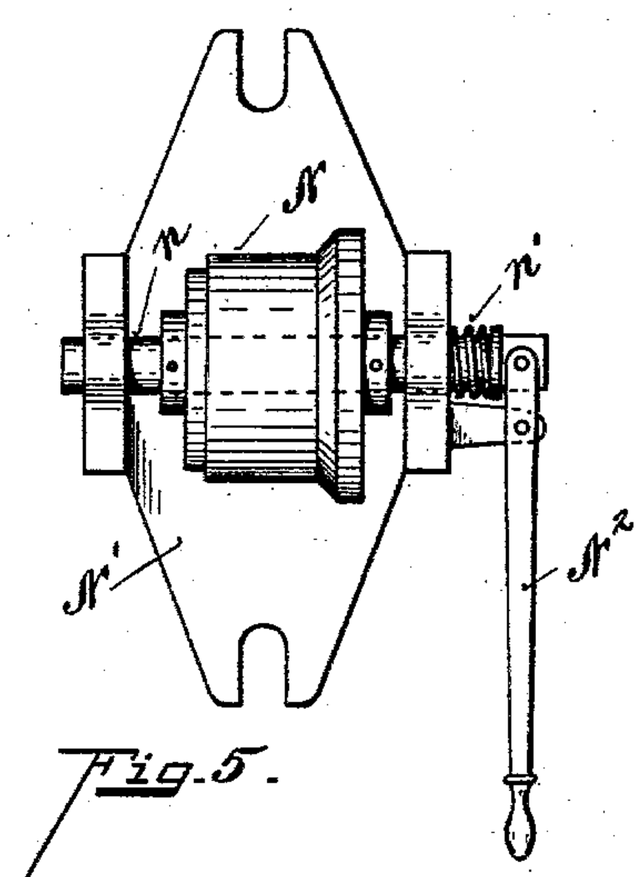

Fig. 5.

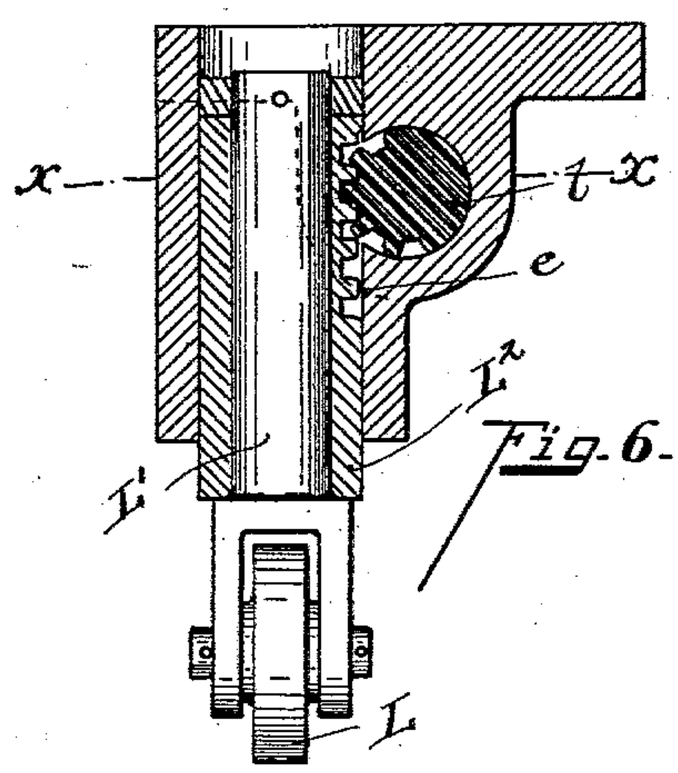

Fig. 6.

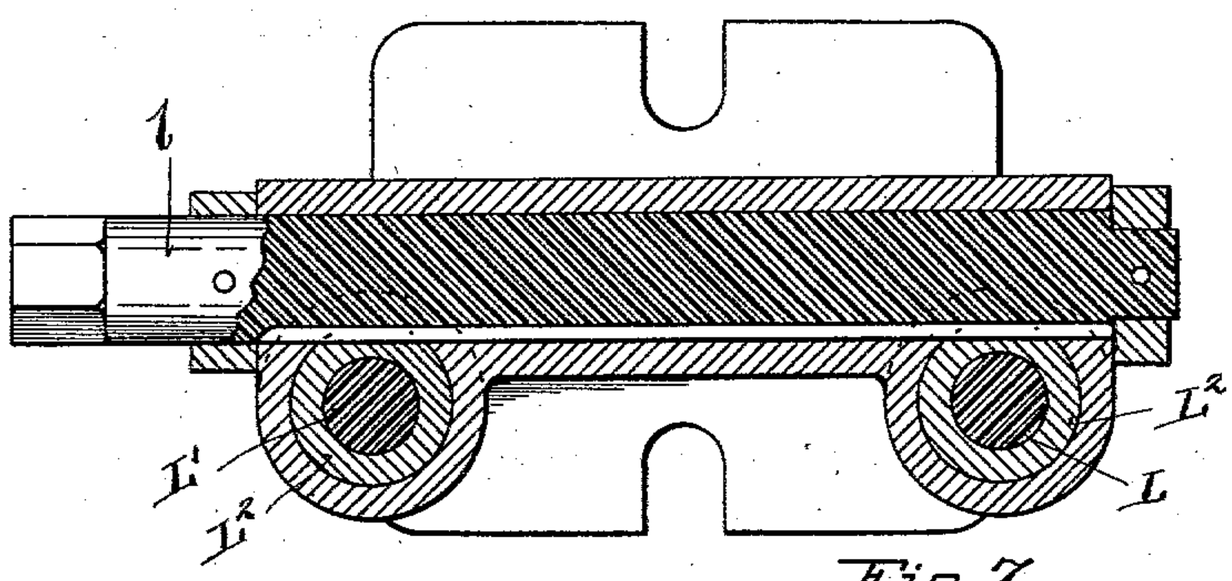

Fig. 7.

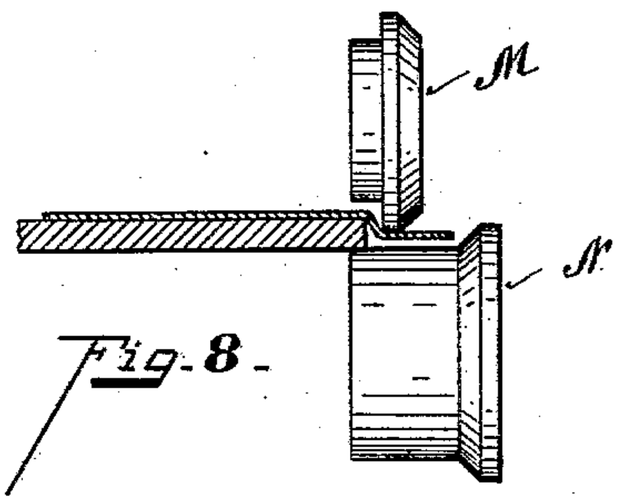

Fig. 8.

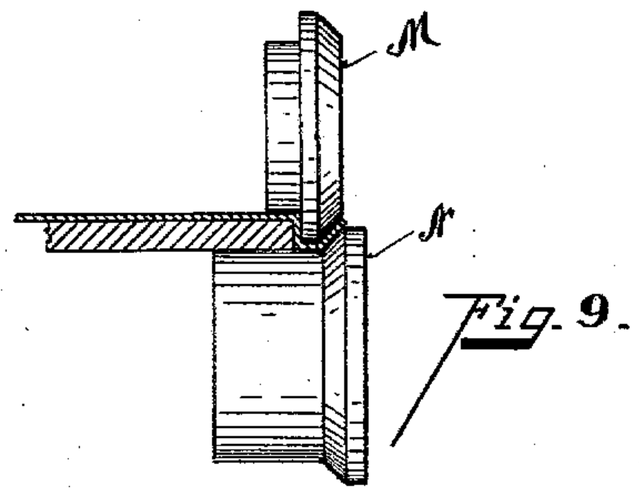

Fig. 9.

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No. 745,665. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

THEODOR REIS, OF CINCINNATI, OHIO.

METAL-FLANGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 745,665, dated December 1, 1903.

Application filed June 12, 1903. Serial No. 161,201. (No model.)

To all whom it may concern:

Be it known that I, THEODOR REIS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Metal-Flanging Machines, of which the following is a specification.

The object of my invention is to provide a combined cutting and flanging machine whereby large circular heads used in making large-sized cans, barrels, &c., are cut and flanged in one setting.

Another object of my invention is to provide a power-machine whereby the cross-head of the machine may be raised and lowered by means of power and power means to revolve the metal-supporting plate for cutting and flanging.

The machine as shown is adapted for additional use, that of fitting and securing the head upon the body of the cans by appropriate mechanism, as shown in my Letters Patent No. 547,183, granted October 11, 1895, or with other appropriate mechanism.

The features of my invention are more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a central section, partly in elevation, of my improved machine. Fig. 2 is a sectional view of one of the flange-forming dies and its supporting means. Fig. 3 is a top plan view thereof. Fig. 4 is an end elevation of the same. Fig. 5 is a top plan view of the other or lower flange-forming die. Fig. 6 is a vertical section view through one of the metal pressure-rollers and its support. Fig. 7 is a section on line $x\,x$, Fig. 6. Fig. 8 is a diagrammatic view of the first flanging operation. Fig. 9 is a diagrammatic view of the second or finishing operation.

A represents the bed of the machine, provided with upright columns A′, on which is adjustably supported the cross-head B. The upright columns are connected at the top by the connecting-beam A^2, upon which are suitably supported the power elevating means.

B represents the cross-head engaging the columns A′, which serve as guides upon which the cross-head slides.

C represents screw-rods having threaded engagement with the outer extremities of the cross-head B for raising and lowering the same by the forward or reverse rotation of the screw-rods. The rotation of the screw-rods is accomplished through the following instrumentalities:

D represents a pulley-wheel loosely mounted upon the shaft D′, said shaft being suitably journaled in bearings on the base A.

d represents a bevel-gear rigidly secured to the shaft D′.

D^2 represents a vertical shaft suitably journaled in a foot-plate at its lower end and by a bracket at its upper, said bracket being secured to one of the upright columns A′.

d' d^2 represent bevel-gears normally meshing with the bevel-gear d and loosely mounted on the shaft D^2, gear d^2 being held in place by the collar d^3.

d^4 represents a clutch (shown in Fig. 1) splined to shaft D^2 and adapted to be clutched with the clutch members of either of the gears d' d^2, thereby enabling a forward or reverse rotating of the shaft D^2.

D^3 represents a shifting-lever in connection with the clutch d^4, adapted to shift the clutch into engagement with either one of the respective clutch members of the gears d' d^2.

D^4 represents a shaft suitably journaled upon the cross-beam A^2, being provided at one end with a bevel-gear D^6 keyed thereto, in mesh with a bevel-gear D^5, fixed on shaft D^2, said shaft D^4 being provided with bevel-gears 1 and 3 fixed thereto, in mesh with bevel-gears 2 and 4, fixed to the screw-rods C. Through this transmission the cross-head, by means of the engagement of the screw-rods C, is raised and lowered as desired.

H represents a revolving head, upon which is secured the form-platen H′. This platen H′ is of a size equal to the diameter of the can for which the heads are formed. Varying sizes of platens may be employed for corresponding varying sizes of cans.

g^2 represents a shaft having bearing in the sleeve g^3 of the base A and held in position by means of the flange g^4.

g' represents a bevel-gear keyed to the shaft g^2 at its lower end, while the head H is keyed upon the opposite end and adapted to be revolved therewith.

G represents a clutch splined to shaft D′, adapted to be shifted into engagement with

the clutch member of the driving-pulley D to a drive-shaft D'.

G' represents a bevel-gear fixed to shaft D' and in mesh with gear g', through which transmission the head H is given rotation.

The sheet metal to be formed is supported upon the platen H' and held by means of the following instrumentalities:

H^2 represents a swiveling platen-head journaled concentric to platen H' and mounted upon a spindle h, which is journaled in the sleeve h'. Said spindle is adapted to have vertical movement in its journal-bearing in order to enable compression to be applied through the head H^2 upon the sheet metal supported on the platen H'. Said sleeve h' is mounted in a central bore of the cross-head B. In order to hold the upper platen-head H^2 down to its work, I have provided a weighted lever I, provided with a presser-foot I^3, and hinged to a bracket I', mounted on the cross-head.

I^2 represents a chain for operating the lever I, holding the presser-foot down on the spindle h, and thereby clamping the upper head down upon the platen and lower driven head.

The mechanism for cutting the sheet metal into the circular form is substantially the same as that shown in my former patent in construction and operation, except the parts are differently mounted and combined.

J represents a tool-stock adjustable and connected to the bed in the usual manner for connecting such tool-stocks.

j represents a circular cutter journaled on the tool-stock.

K represents a tool-stock adjustably mounted on the cross-head and carrying a revolving cutter k journaled thereon.

The two cutters are driven by their frictional engagement with the sheet metal on the platen, and the metal is cut in circular form by the revolving of the lower head and its contained platen at one revolution, lever I^4, clutch G, pulley-wheel D being the actuating means.

The flanging mechanism is mounted on the bed-plate and cross-head upon opposite sides of the platen. It is preferred to cut the head first and then flange it afterward, and for this purpose the flanging mechanism is made adjustable by means of levers adapted to raise and lower the flanging member mounted upon the cross-head. In order to make the obtuse flange without injury by too abrupt bending of the metal, it is made in two steps. Fig. 8 illustrates the first step, and Fig. 9 the second.

The method of mounting and operating the flanging-tools is illustrated in enlarged views Figs. 2, 3, 4, 5, 6, 7. In order to hold the metal in proper position rotative to the flanging die-rolls M N, I provide the frictional rollers L, (see Fig. 6,) supported on a spindle L', supported within a sleeve L^2. Said sleeve is provided with rack-teeth e, engaging with teeth of a segment-shaft l, so that the said rollers may be raised and lowered by means of a crank-arm applied to the shaft l. These rollers L hold the outer edge of the sheet metal down on the revolving platen, and thereby prevent the metal from buckling toward the clutch under the action of flanging. N represents the lower flanging-roll, loosely journaled upon shaft n, as shown in Fig. 5, said shaft being supported upon ears extending from the stock N'. The lower flanging-roll N is moved inward toward the machine-center by means of the shifting-lever N^2. n' represents a coil-spring normally holding the flanging-roll N away from the platen H'. M represents the upper flanging-roll, loosely journaled upon the shaft m. This shaft is mounted in an eccentric sleeve m', which may be turned to adjust the flanging-roll vertically for proper relation with the lower flanging-roll. The shaft and sleeve are supported by a boss formed on the cross-plate M', which is supported by rods M^2 and coil-springs M^3, mounted for vertical adjustment upon the cross-plate M^4, (see Figs. 2, 3, 4,) said cross-plate M^4 being adjustably secured to the cross-head B. The vertical adjustment is accomplished by means of eccentrics O', fixed to shaft O. Shaft O is in turn mounted upon the cross-plate M^4. As the shaft O is turned in one direction it depresses the cross-plate M', thereby adjusting the upper flanging-roll M downward to give it the requisite flanging pressure. P represents a lever pivoted at one end to a projection from the cross-plate M' and to the shaft m, operating against spring tension for manipulation of the upper flanging-roll M. (See Fig. 3.)

The flanging operation is as follows: After the metal has been cut to a circle the flanging-dies are brought to the position shown in Fig. 8. Preferably while the platen H' is being rotated the cutting-tool j is working on one side of the machine, while the flanging-rolls M N are operating upon the trimmed edge of the blank on the other side of the machine. The bearing-rollers L hold the edge of the blank firmly down on the platen H'. In this first step (shown in Fig. 8) the trimmed edge of the blank projects beyond the edge of the platen and lies upon the hub of the lower roll N. The upper roll M is given a lateral adjustment between the edge of the platen and the flange of the lower roll N. It is then brought down vertically, giving to the edge of the blank an obtuse bend. In the next revolution of the platen the rolls are given the position shown in Fig. 9, the straight edge or inner edge of the roll M clamping the edge of the blank vertically against the edge of the platen, the periphery of the flange of roll M clamping the edge of the blank down upon the hub of the roll N, and the bevel-face of the flange-roll M clamping the extreme outer edge of the blank against the bevel-face of the flange of roll N. These heads can obviously be quickly cut and crimped without danger of buckling.

Preferably at least two steps are employed for the flanging. It will be noted that with the rolls in the position shown in Fig. 9 the metal between the edge of the platen and the inner straight edge of the flange of roll M is at right angles to the plane of the blank on the platen. If such an abrupt turn were made in a single operation—that is, bending from the horizontal plane of the blank to the vertical plane of the flange—it would be apt to cut the metal. Therefore to first give the obtuse angle of Fig. 8 and then bend from this obtuse angle to the right angle of Fig. 9 is obviously the safest operation. It is possible to accomplish this flanging in one revolution by immediately bringing the rolls in position shown in Fig. 9, but when done it has a tendency at times to injure the texture of the metal, and it is preferred to do the flanging in two step movements.

Various forms of flanging may be made by simply changing the design of the rolls.

It is obvious that the machine herein shown and described is adapted to be used both as a circular-trimming machine and a flanging-machine. Preferably, as shown and described, the cutting and trimming and first step of flanging may be formed simultaneously.

Having described my invention, I claim—

1. In a metal-flanging machine having a base, a platen journaled on said base, means for rotating said platen, a cross-head adjustably mounted upon columns extending upwardly from the base, rotatable means mounted on said cross-head for clamping the metal to be flanged to the platen, a lower flanging-roll journaled on the base opposite the edge of the platen, an upper flanging-roll journaled on the cross-head, and means for adjusting said rolls in proper flanging relation to each other and to the edge of the platen, substantially as described.

2. In a metal-flanging machine having a base, a platen journaled on said base, means for rotating said platen, a cross-head adjustably mounted upon columns extending upwardly from the base, rotatable means mounted on said cross-head for clamping the metal to be flanged to the platen, a lower flanging-roll journaled on the base opposite the edge of the platen, an upper flanging-roll journaled on the cross-head, means for adjusting said rolls in proper flanging relation to each other and to the edge of the platen and adjustable means mounted on the cross-head for depressing the metal at the edge of the platen on both sides of the upper flanging-roll, substantially as described.

3. In a metal-flanging machine, a base, a platen journaled thereon, means for rotating the same, a cross-head adjustably mounted above the base, means mounted on the cross-head for clamping the metal to the platen, a plate mounted on the cross-head provided with independent longitudinal and lateral adjustments, an upper flanging-roll loosely journaled in said plate, a lower flanging-roll adjustably mounted and loosely journaled on the base, and means for independently adjusting said rolls in proper flanging relation to each other and to the edge of the platen, substantially as described.

4. In a metal-flanging machine, a base, a platen journaled thereon, means for rotating the same, a cross-head adjustably mounted above the base, means mounted on the cross-head for clamping the metal to the platen, a plate mounted on the cross-head provided with independent longitudinal and lateral adjustments, an upper flanging-roll loosely journaled in said plate, a lower flanging-roll loosely journaled and adjustably mounted on said base, means for independently adjusting said rolls in proper flanging relation to each other and to the edge of the platen, and adjustable means mounted on the cross-head for depressing the metal at the edge of the platen on both sides of the upper flanging-roll, substantially as described.

5. In a metal-flanging machine, a base, a platen journaled thereon, means for rotating the same, a cross-head adjustably mounted above the base, means mounted on the cross-head for clamping the metal to the platen, a plate mounted on the cross-head provided with independent longitudinal and lateral adjustments, an upper flanging-roll loosely journaled and eccentrically mounted in said plate for independent relative adjustment with the lower flanging-roll, a lower flanging-roll loosely journaled and adjustably mounted on said base, means for independently adjusting said rolls in proper flanging relation to each other and to the edge of the platen, and adjustable means mounted on the cross-head for depressing the metal at the edge of the platen on both sides of the upper flanging-roll, substantially as described.

6. In a metal-flanging machine, a base, a platen journaled thereon, guide-rods extending from the base, a cross-head slidably mounted thereon, a cross-beam on said rods, vertical screw-shafts engaging said cross-head for raising and lowering the same, a horizontal shaft on the top beam, transmitters between said horizontal and vertical shafts, a vertical shaft for operating the horizontal shaft over the cross-head, transmitters therefor, a shaft for rotating the platen, clutches between said cross-head-operating shaft and platen-rotating shaft, means mounted on the cross-head for clamping the metal to the platen, a plate mounted on the cross-head provided with independent longitudinal and lateral adjustments, an upper flanging-roll loosely journaled and eccentrically mounted in said plate for independent relative adjustment with the lower flanging-roll, a lower flanging-roll loosely journaled and adjustably mounted on said base, means for independently adjusting said rolls in proper flanging relation to each other and to the edge of the platen, and adjustable means mounted

on the cross-head for depressing the metal at the edge of the platen on both sides of the upper flanging-roll, substantially as described.

7. In a metal-flanging machine, a base-plate, a platen thereon, guide-rods from the base-plate, a cross-head slidably mounted thereon, a cross-beam on said rods, vertical screw-shafts engaging said cross-head for raising and lowering the same, a horizontal shaft on the top beam, transmitters between said horizontal and vertical shafts, a vertical shaft for said plates, a horizontal shaft therefor, transmitters therefor, a vertical shaft for operating the horizontal shaft over the cross-head and clutches between said cross-head-operating shafts and said platen-rotating shafts, substantially as described.

In testimony whereof I have hereunto set my hand.

THEODOR REIS.

Witnesses:
OLIVER B. KAISER,
LOUISE BECK.