FIG. 2.

FIG. 3.

WITNESSES:
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Att'y.
To all whom it may concern:

Be it known that I, JAMES H. BAKER, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful improvements in the Manufacture of Wagon-Clips, of which improvements the following is a specification.

The invention described herein relates to certain improvements in the manufacture of carriage-clips, &c. These clips consist of a broad, flat, and comparatively-thin body portion, provided at their ends with round stems, and it is customary to form these clips by flattening the middle portions of round rods having a diameter equal to that of the stems of the completed clip. This flattening has heretofore been done by spreading out the middle portions of the rods into a suitable die by a hammer, the die being reciprocated under the hammer. As portions of the body portions of clips extend on each side of the axial line of the stems, the body portions of the rods must be spread in both directions.

While this opposite spreading can easily be effected under the hammer by shifting the die back and forth, it has heretofore been deemed impossible to form clips having the body portion flattened by rolling.

The object of this invention is to provide for holding the rods in proper relation to the shaping portions of the rolls until they are gripped between the rolls and then allowing or causing the stems to move back into the holding-grooves, where they will be unaffected by the rolls.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is an end elevation of a pair of rolls embodying my improvement. Fig. 2 is a plan view of the lower roll, showing the shaping-matrix. Fig. 3 is a transverse section of the roll. Fig. 4 is a front elevation of rolls adapted for use in connection with the endwise feed of the rods. Fig. 5 is an end elevation of the construction shown in Fig. 4. Fig. 6 is a plan view of the lower or matrix roll, showing a modification in the shaping-matrix. Fig. 7 is a transverse section; Fig. 8, an end elevation of the roll shown in Fig. 6. Figs. 9 and 10 are end elevations illustrating modifications in the means employed for feeding the rods to the rolls and removing the finished blank therefrom, the mechanism being shown in different positions in the two figures, but both on the second revolution of the rolls; and Fig. 11 is a front elevation of the arrangement shown in Figs. 9 and 10.

In the practice of my invention the rolls 1 and 2 are mounted in suitable housings, the upper roll being adjustable in any manner known in the art toward and from the lower roll. As the thickness of the body portions of the clips, except as regards the edges and a rib in line with the axes of the stems, is regulated by the distance between the upper and lower rolls, the faces of both rolls are made plain or of uniform radius, except as hereinafter specified. As is well known, it is impossible to make rolls which will not spring or yield somewhat when a piece of metal is passed between, and as front and rear ends or edges of the piece of metal present less resistance to reduction than the body portion thereof, such ends or edges will be thinner than the body portion, so that when the body portion is thin the ends or edges of the metal piece are liable to be drawn to a knife-edge. In order to avoid the formation of the knife-edges on the body portion of the clip, grooves 3 and 4 are formed in the face of the lower roll 2, where the edges of the body portion of clip are to be formed. The outer walls of these grooves are made approximately abrupt or straight in a radial direction, while the opposite or inner faces merge gradually to the general contour or surface of the roll, as clearly shown in Fig. 3.

As the ends of the rod from which the clip is formed are not reduced or changed, grooves 5 are formed in the roll 2 for the reception of the ends of the rods. The walls at the inner ends of these grooves incline gradually upward and inward forming V-shaped portions 6, the walls of which gradually merge to the general contour or surface of the roll, except that a V-shaped groove 7 connects the apices of the portions 6. This groove 7 extends across the shaping or reducing portion of the roll, so that a correspondingly-shaped rib is
formed on one side of the body portion of the clip in line or approximately in line with the axes of the stem portions of the clips.

If a rod should be placed across the shapping portion of the roll 2 with its axes in line radially with the axes of the grooves 5 and while in that position passed between the rolls, the flattened middle portion would lie almost entirely on one side of the axes of the stems. In order to effect a more equable distribution of the flattened portion with relation to the stems, holding-arms 8 are so secured to the ends of the rolls that hooks 8a on said arms will hold the rod with its axis ahead of the axial lines of the grooves 5 a distance proportional to the desired distribution or location of the flattened portion relative to the stems. The forward edges of the hooks 8a are inwardly inclined, and the front walls a of the grooves 5 are similarly inclined, so that when the end portions of the rolls are forced down into the grooves 5 they will also be forced backward by the inclines of the hooks 8a and the inclined walls a of the grooves 5 into said grooves, thereby bringing the stems into proper relation to the flattened portion of the clip. It will be understood that by adjusting the arms 8 the positions of the stems relative to the flattened portions in the grooves 5 can be changed as desired.

It is sometimes the practice to cut the rod into sections, heat the sections, and then feed them to the rolls. To facilitate the feed of the sections, a hopper 9 is attached to the housing of the rolls for the reception of the heated sections. The sections are caught by the pointed ends of the arms 8 and carried one by one between the rolls. The section immediately above the one carried forward drops down onto the roll 2, but is prevented from being carried forward by the roll by a spring 10, as shown in Fig. 1, the rear ends of the springs serving to hold the rod to be shaped in position against the hooks 8a.

In order to remove the completed blank or clip from the roll 2, levers 11 are pivotally mounted on the ends of the roll in such relation to the grooves 5 that when the levers are shifted one end thereof will strike against the projecting stems of the completed clip-blank and remove the latter from the roll 2. Shifting-plates 12, having cam-shaped ends, are so secured to the housing of the rolls that the tails or outer ends of the levers 11 will strike against and be shifted by the plates after the shaping portion of the roll 2 has passed from under the roll 1. The levers are returned to normal position by springs 13.

As it is sometimes desirable to heat a long length of rod and feed it longitudinally to the rolls, a guide feed-tube 14 is attached to one of the housings and a stop-plate 15 to the opposite housing in such positions as to permit of the rod being fed across the roll 2 after the arms 8 have passed up, as shown in Figs. 4 and 5. In order to cut off the portions of the rod thus fed across the roll 5, the front edge of the holding-arm 8 on the end of the rod adjacent to the feed-tube 14 is constructed to form a shear-blade, and the complementary blade 16 is secured to the housing of the rolls.

It has been found that when clips are broken in use the splitting or rupture begins at one or the other edge of the flattened portion. In order to strengthen the clips and provide for the formation of ribs along the edges from one stem to the other by comparatively-deep grooves 3a and 4a and extending them so that at their ends they will merge or run into the grooves 5, in lieu of dividing the matrix or forming portions of the roll 2 into two tables b and c by the groove 7, as shown in Figs. 2 and 4, the groove 7 is omitted, so that the matrix or the portion of the roll employed for forming the body of the clip consists of a single continuous table d, as shown in Fig. 6. The ends of this table are V-shaped, as at 17, and project into the grooves 5. The side walls of these V-shaped portions gradually merge into the inner walls of the grooves 3a and 4a. By the action of these projections the metal of the stems adjacent to the flattened portion is divided and caused to pass into the grooves 3a and 4a.

For convenience of manufacture it is preferred to construct the metal-shaping parts of the matrix on the surface of a block 18, which can be secured within a recess in the roll 2. Such a construction permits of the easy and cheap change or renewal of the essential parts when different sizes of clips are to be manufactured or the parts of a matrix become worn.

In lieu of forming the holding-hooks 8a on 105 arms secured to the ends of the rolls hooks 8a, suitably shaped to perform the same function, may be formed on one end of the levers 11, which are employed for removing the completed blanks from the rolls, as shown in Figs. 9 and 10.

If the clip-blanks be subjected to a rolling operation after being shaped, a smoother and better finish is imparted thereto. While this second rolling may be effected in several ways, it is preferred to perform this operation by the shaping-rolls. To this end it is necessary to so arrange the mechanism for removing the clip-blanks from the rolls and the feed of the rods to the rolls that such operations will be effected only on every other revolution of the rolls. A convenient mechanism for this purpose is shown in Figs. 9, 10, and 11. The shifting-plates 12 for shifting the discharging-levers 11 are pivotally mounted on the housings of the rolls in such manner that when free to move they will drop into the path of movement of the outer outturned ends of the levers 11. These shifting-plates are normally held out of 130 operative position by spring-arms 19, attached at one end to the housings and provided with shoulders 20, adapted to support the shifting-plates out of operative position.
The ends of these spring-arms when supporting the shifting-plates project into the path of movement of the outer ends of the levers 11, so that on first revolution of the rolls 5 the levers 11 will shift the spring-arms 9 thereby permitting the shifting-plates to drop to such a position that the levers will strike the plates on the next revolution and be shifted to discharge the blanks.

In order to shift the plates 12 back to normal or inoperative position, bell-crank levers 21, which are pivotally mounted on the housings, have one end connected by links 22 to the shifting-plates, while the opposite ends of the levers project into the paths of movement of pins 23 on the sliding bars 24. These bars are mounted in suitable guides on the housings, are provided with lugs or projections 25, which when the levers 11 are in normal position are at one side of the paths of movement of the levers as the rolls revolve, but are so located that when the levers 11 are shifted by contact with the cam-plates on the second revolution of the rolls the tails of said levers will strike the projections 25 and shift the sliding bars. By this movement of the bars the lugs or projections are brought to such positions that the points of cam projections 26 on the ends of the rolls will pass out of side of the projections 25, and as the rolls continue to rotate will shift the sliding bars farther to the left, and thereby lift the shifting-plates sufficiently far to permit the shoulders 20 on the spring-arms 19 to pass under the shifting-plates and hold them out of the path of movement of the tails of the levers 11. As the cam projections 26 pass beyond the projections 25 on the sliding bars the latter will be returned to normal position by springs 27. By reference to Fig. 9 it will be seen that when the levers 11 are in normal position the lugs 25 on the bars 24 will pass between the levers and the cam projections 26 on the rolls. The levers 11 are returned to normal or inoperative position when the tails thereof pass beyond the shifting-plates by the springs 27 and are held in such positions by stops 29. The movement of the shifting-plates to operative position may be insured by means of springs 30.

In order to prevent rod-sections from dropping onto the rolls during the first or shaping revolution of the rolls, the hopper is provided with a supporting-ledge 31, on which the rod-sections will rest until pushed forward over the discharge-opening of the hopper. The shifting of the rod-sections off of the ledge may be effected by any suitable means, but preferably by pushers 32, which have their outer ends connected by bell-levers 33 to the sliding bars 24. As these bars are operated only on every second revolution of the rolls rod-sections will be fed to the shaping-matrix only at such times.

I claim herein as my invention—
1. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed sidewise between the rolls and means for holding the rod with its axis within but at one side of the median line of such shaping portion while being carried between the rolls, substantially as set forth.

2. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed sidewise between the rolls and provided with grooves on each side of such shaping portion of the roll for the reception of the portions of the rod on each side of the part to be shaped by the action of the rolls, the axes of the grooves being within but at one side of the median line of the shaping portion of the roll, substantially as set forth.

3. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed sidewise between the rolls and provided with grooves on each side of such shaping portion of the roll for the reception of the portions of the rod, means for holding the rod in proper relation to the shaping portion and the grooves while being carried between the rolls, and means for shifting portions of the rod into said grooves during the shaping of the intermediate portion, substantially as set forth.

4. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed laterally between the rolls, means for holding the rod in suitable relation to such shaping portion while being carried between the rolls and means for shifting portions of the rod outside of the shaping portion of the rolls out of the plane of action of said rolls during the shaping of the intermediate portion and means for removing the shaped article from the rolls, substantially as set forth.

5. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed sidewise between the rolls, means for holding the rod in proper relation to such shaping portion while being carried between the rolls and means operative on every second revolution of the rolls for removing the shaped blank from the rolls, substantially as set forth.

6. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed laterally between the rolls, hooks for holding the rod in suitable relation to such shaping portion and supports for holding the rod in such relation to the clamping-hooks, as to be caught thereby on the revolution of the roll, substantially as set forth.

7. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed sidewise between the rolls, means for holding the rod in proper relation to such shaping portion while being carried between the rolls, a guide for directing the rod longi-
8. The combination of a pair of rolls, one of said rolls having a portion of its face suitably constructed for shaping a portion of a rod fed sidewise between the rolls, means for holding the rod in proper relation to the shaping portion while being carried between the rolls, levers for shifting the finished article from the rolls, an abutment for shifting levers automatically movable into the path of movement of the levers, mechanism operative on every other revolution of the rolls for shifting the abutment to inoperative position and a detent operative by the levers for holding the abutment in operative position, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JAS. H. BAKER.

Witnesses:

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