

E. TRUMAN & A. TIETZ.  
BAG TIE MACHINE.  
APPLICATION FILED OCT. 18, 1911.

Patented Nov. 18, 1913.

3 SHEETS—SHEET 1.

1,079,075.

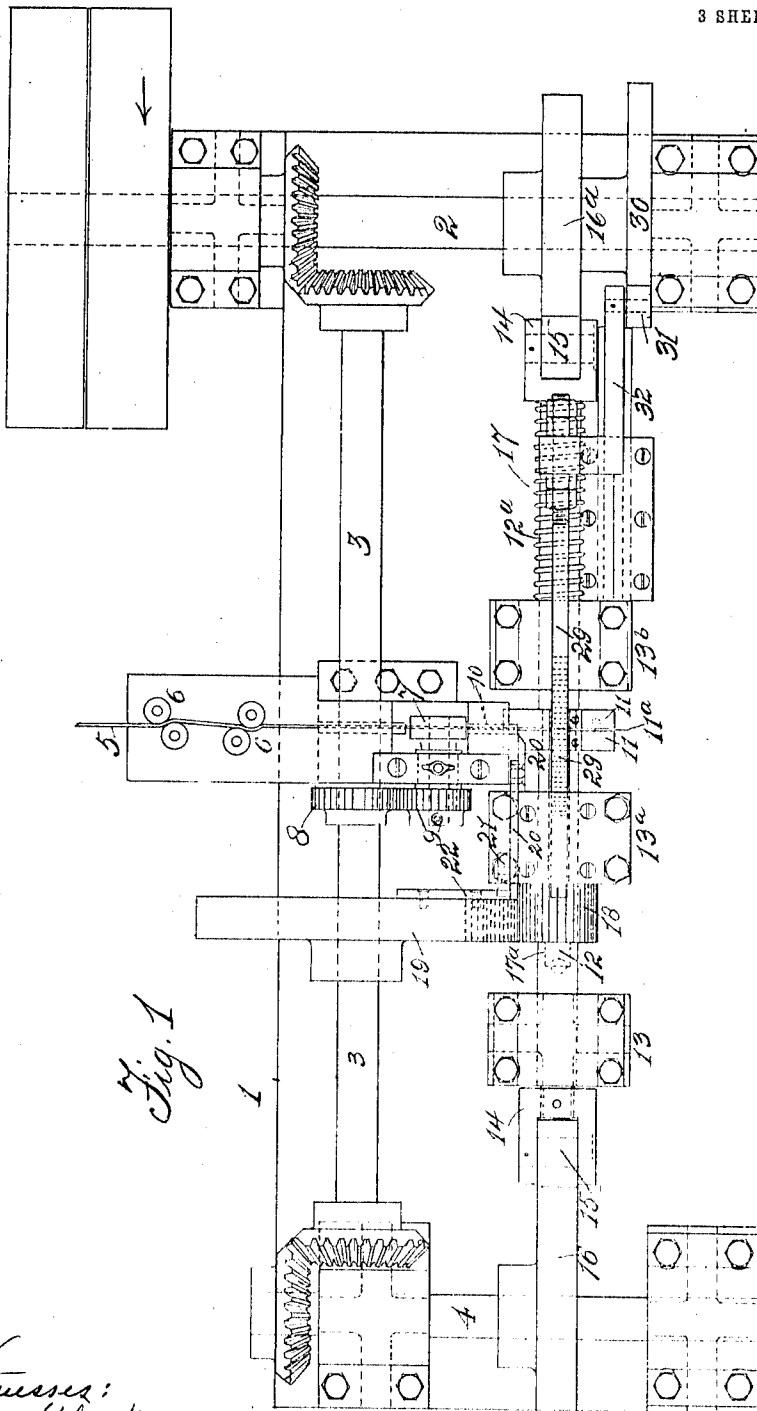


Fig. 1

Witnesses:  
Dora Schubert  
Alice Sullivan

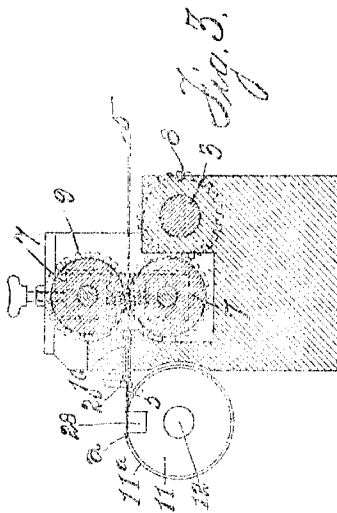
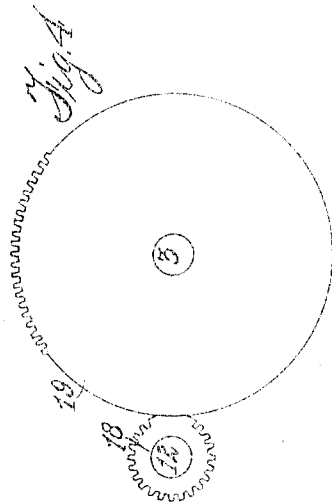
Inventors:  
Ernest Truman and August Tietz,  
By Howard Hall, their atty.

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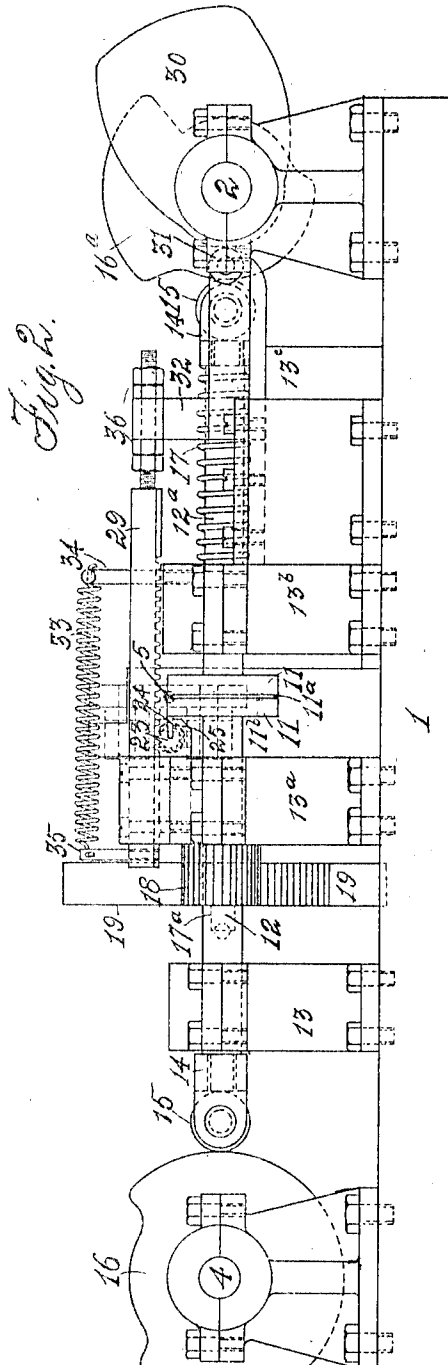
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3 SHEETS-SHEET 2.



Witnesses:  
Ernest Truman  
Alice Sullivan



Inventors:  
Ernest Truman and August Tietz  
By Newell & Co. Their Attys.

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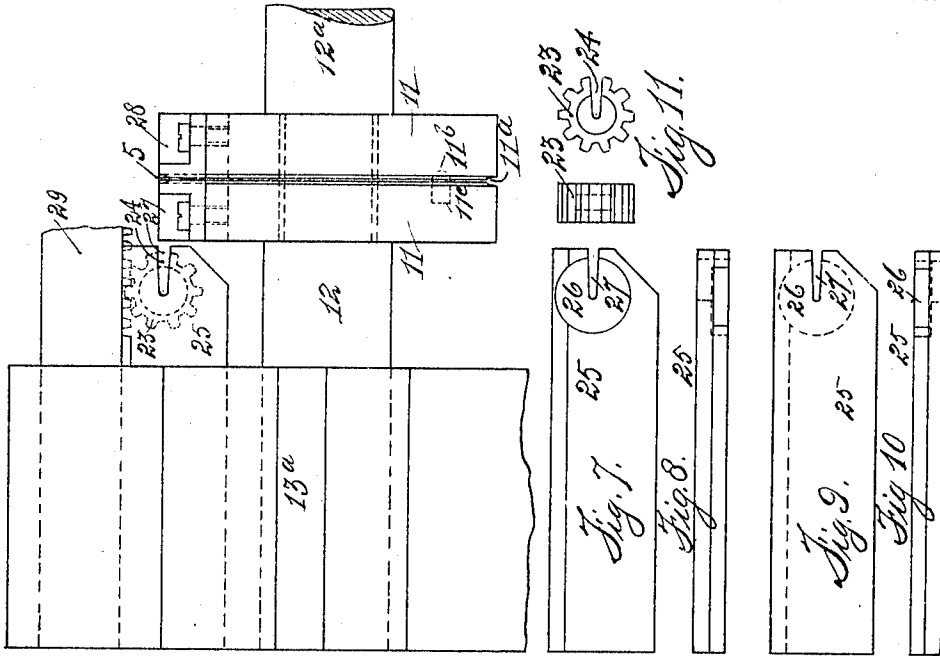


Fig. 5.

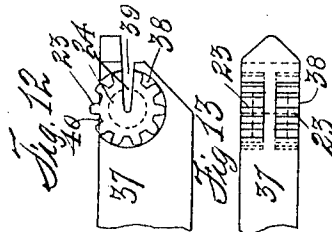
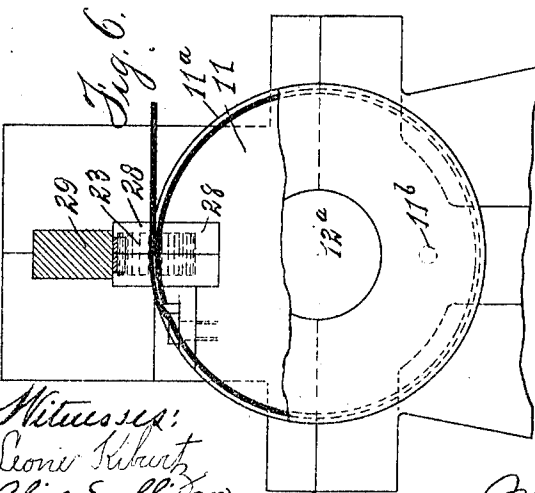


Fig. 12.

Fig. 13.



# UNITED STATES PATENT OFFICE.

ERNEST TRUMAN AND AUGUST TIETZ, OF TOLEDO, OHIO, ASSIGNORS, BY MESNE ASSIGNMENTS, TO BATES VALVE BAG COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF WEST VIRGINIA.

## BAG-TIE MACHINE.

1,079,075.

Specification of Letters Patent.

Patented Nov. 18, 1913.

Application filed October 18, 1911. Serial No. 655,359.

*To all whom it may concern:*

Be it known that we, ERNEST TRUMAN and AUGUST TIETZ, citizens of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Bag-Tie Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to a machine for the manufacture of bag-ties consisting of a ring composed of stout flexible wire. Bag-ties of this kind are formed of a piece of wire of suitable length, the ends being brought together and twisted about each other. The ties are applied by slipping the ring over the folds of the closed end of the bag or sack and by then twisting the ring tightly upon the neck of the bag by means of a suitable instrument held in the hand of the operator. This tie does not injure the sack and is readily and easily untwisted and removed to open the sack.

Our invention relates, more particularly, to mechanisms for rapidly taking wire from a coil, forming it into a ring of suitable dimensions, cutting off the wire and twisting the overlapping ends of the wire around each other to form a smooth stout ring, for the purpose indicated.

To this end our invention consists of the devices, construction and arrangement of parts hereinafter described, and shown and illustrated in the accompanying drawings in which,—

Figure 1 is a top-plan view of our machine; Fig. 2, a side-elevation of the same; Fig. 3, a section seen from the right in Fig. 2, of the feed-mechanism hereinafter referred to; Fig. 4, a side-elevation of the intermittent gear hereinafter referred to; Fig. 5, a front-elevation,—on an enlarged scale,—of the ring-forming disk hereinafter referred to, together with the case for the twisting-gear and the rack which actuates the same; Fig. 6, a side-elevation of the same seen from the right in Fig. 5; Fig. 7, a side-elevation of one of the recessed bars which forms the case for retaining the twisting

gear hereinafter referred to; Fig. 8, a top-plan view of the same; Fig. 9, a side-elevation of the other of said bars; Fig. 10, a top-plan view of the same; Fig. 11, a front and side elevation of the twisting-gear hereinafter referred to, detached; Fig. 12, a side-elevation of a modification of said twisting-gear in place; Fig. 13, a top-plan view of the same; Fig. 14, a top-plan view of the ends of the wire tie twisted together by my device, and Fig. 15, a side elevation of the same.

Like parts are represented by corresponding numerals throughout the drawings.

This apparatus, designed to produce rings of the particular kind indicated, consists primarily of a machine-bed or base 1, upon which the various parts, now to be described, are suitably supported, such bed being raised by means of legs or a bench,—not shown,—to a suitable height above the floor. Journaled across one end of the frame is a driving shaft 2, which, through beveled gears on counter-shaft 3, drives a shaft 4 journaled across the opposite end of the frame. The wire 5, to be formed into rings or ties, is drawn through straightening rolls 6 by means of feed-rolls 7 driven by gear 8 on shaft 3 meshing with one of the gears 9 on the shaft of one of the feed-rolls. The wire passing between the feed-rolls is led by a guide-tube 10 to a point indicated at *a* in Fig. 3, where the next step in the formation of the tie begins. Although the rotation of the feed-rolls is constant this feed of the wire is intermittent, as the gripping surfaces of the rolls do not extend around their entire circumference. One of the rolls is adjustable axially to vary the arc of gripping contact and the consequent feed of the wire at each revolution of the rolls. (See Fig. 3.)

11—11 are a pair of like disks rigidly mounted upon the adjacent ends of two shafts 12—12<sup>a</sup>. These shafts are journaled longitudinally of the frame in pillow-blocks or pedestals 13—13<sup>a</sup>—13<sup>b</sup>—13<sup>c</sup> and have a rotary movement in their bearings as well as a longitudinal movement toward and away from each other and with each other, as hereinafter explained. The margins of the meeting faces of the disks are slightly beveled so that when the two disks are brought together they form a cylinder having a sharp circumferential groove 11<sup>a</sup>. One of the disks is provided with a transverse hole 11<sup>b</sup>, which,

when the sides of the disks are in contact, is engaged by a corresponding pin 11<sup>a</sup> projecting from the side of the other disk so that when one of the contacting disks is revolved the other must revolve with it. At the outer ends of each of the shafts 12—12<sup>a</sup> is a forked head 14, between the arms of which is journaled a roller 15 one of which rollers contacts with the face of a cam 16, which is mounted on the shaft 4, the other roller 15 contacting with cam 16<sup>a</sup> mounted upon the driving shaft 2. A spring 17 which is coiled around the shaft 12<sup>a</sup> holds the shafts 12—12<sup>a</sup> and the companion disks 11 normally separated. The two cams 16—16<sup>a</sup>, moving in unison, are of such peripheral contour as to force the two disks powerfully against each other, side by side, during part of the rotation of the cams 16—16<sup>a</sup> as well as to move the two shafts together endwise as hereinafter described. When the rollers 15 pass from the circular faces of the cams 16—16<sup>a</sup> the spring 17 pulls the disk 11<sup>a</sup> away from the disk 11, as hereinafter described. While the heads 14 do not revolve and have only a reciprocatory movement, the shafts 12—12<sup>a</sup> have a rotary movement in the heads. To permit this movement the outer ends of the shafts 12 are reduced and are socketed,—as indicated in dotted lines at 17<sup>a</sup> in Figs. 1 and 2,—to furnish a bearing and journal for the outer ends of the shafts 12—12<sup>a</sup>.

The wire having been fed between the feed-rolls 7 so that its end projects between the margins of the adjacent faces of the disks 11, the cams 16—16<sup>a</sup>, which are timed with the feed-mechanism, now,—through the rollers 15 and the shafts 12—12<sup>a</sup>,—force the two disks 11 powerfully together, clamping the end of the wire in the top of the groove 11<sup>a</sup>. At this instant the shafts 12—12<sup>a</sup> with their disks 11 are together caused to quickly describe a complete revolution which draws the wire through the feed-rolls, which at this point release their hold upon the wire, and wraps it around the disks in the groove 11<sup>a</sup>, thus forming a loop. The following described mechanism imparts this timed revolution to the two disks: Fixed upon the shaft 12 and rotatable therewith is a pinion 18, broad enough to permit the longitudinal movement of its shaft without disengaging the pinion from gear 19 fixed on shaft 3. The teeth of the gears 18—19 are “interrupted,”—as illustrated in Fig. 4,—so that during a small part of the rotation of the shaft 3 the shaft 12 is quickly given a complete revolution and so that the shaft and pinion 12—18 stand idle during the remainder of the revolution of the gear 19. It is while the teeth of the gears 18—19 are engaged that the wire loop above described is formed, and it is during the pause of the pinion 18 and the shafts 12—12<sup>a</sup> that the feed of the wire takes place and that the

other steps, to be described, are effected. The second step in the manufacture of our tie,—that is, the forming of the loop,—having been completed, the next step is to sever the wire, between the feed-rolls and the disks 11, which step is performed by the mechanism now to be described.

20 is a stout knife or cutter, formed somewhat as a chisel, and slidably mounted in guides upon the pillow-block 13<sup>a</sup> and held normally retracted by a spring, not shown. The knife carries at its rear end a roller 21 which lies in the path of a wedge-like cam-plate 22 secured to the side of the gear-wheel 19 at or near its periphery. At each revolution of the gear-wheel 19 the plate 22, striking the roller 21, rapidly projects the cutter 20 which severs the wire at the point where it leaves the feed-tube 10 at the instant before the loop has been completed and at the moment just before the gear 18 pauses in its rotation. The wire loop is now firmly clamped in place between the two disks 11 with the ends of the loop overlapping and projecting horizontally. The next step in the formation of the tie is to wrap or coil these overlapping ends around each other, as illustrated in Figs. 14 and 15, and to thus complete the tie. We accomplish these steps by means of the mechanism now to be described.

23 is a toothed disk or gear radially slotted from its center outwardly, as at 24. (See Fig. 11.) This device, which we term a twisting gear, is incased between two corresponding bars 25, recessed in their meeting faces, as at 26, and slotted, as at 27. The coincident recesses 26 form a case in which the twisting gear 23 is loosely supported and peripherally journaled. The slot 27 in the ends of the bars 25 coincides normally with the slot or jaw 24 in the twisting gear. The recesses 26 are open at top to permit the upper teeth of the twisting gear to project there-through. The bars 25 are mounted upon and rigidly secured to the pillow-block 13<sup>a</sup> with the mouth of the slots 24—27 in alignment with the top of the groove 11<sup>a</sup> in the disks 11. Now if the overlapping ends of the wire 5 were introduced into the slot 24 and if the gear 23 were then caused to revolve, the remainder of the loop being held fast, it is clear that the wires would be twisted about each other, as illustrated in Figs. 14 and 15. To permit this, the tops of the two disks 11 are recessed or radially notched across their entire width, as at 28, forming an opening adapted to receive the end of the casing 25 which projects beyond the pillow-block 13<sup>a</sup> toward the disks 11. (See Figs. 2 and 3.) Slidably mounted upon the top of the pillow-blocks 13<sup>a</sup>—13<sup>b</sup> is a rack-bar 29, the teeth of which are engaged with the upwardly projecting teeth of the twisting gear 23. Fixed upon the shaft 13<sup>c</sup>

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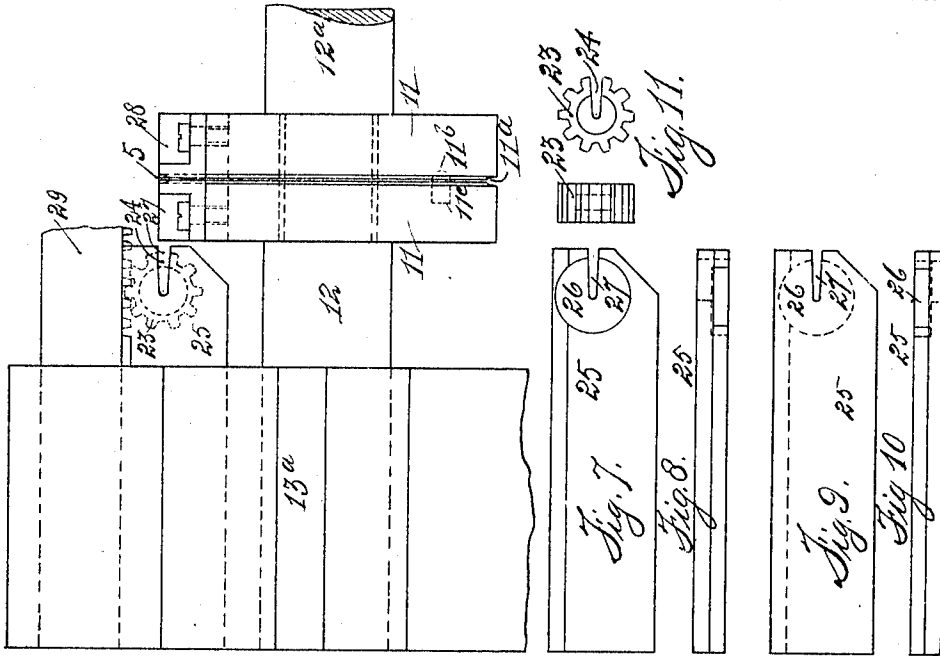


Fig. 5.

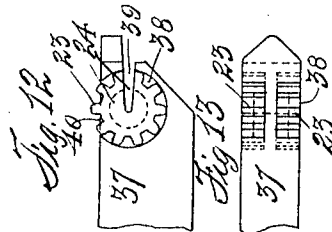


Fig. 12.

Fig. 13.

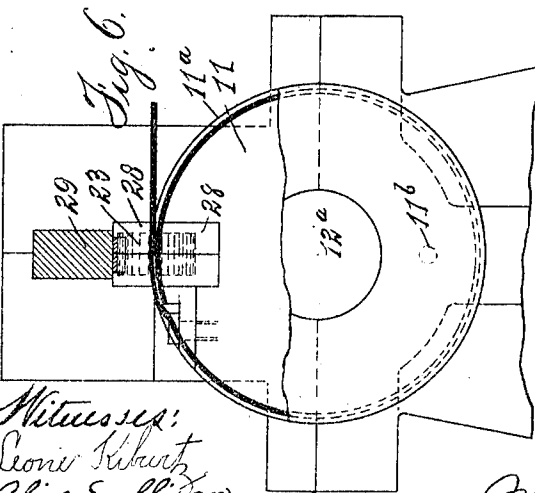


Fig. 6.



Fig. 14.

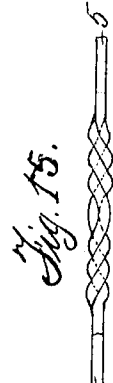


Fig. 15.

Witnesses:  
Leon K. Kuntz  
Alice Sullivan

Inventors:  
E. Truman & A. Tietz.  
By Arthur Hall, Their Atty.



for moving the finished loop bodily to the twisting means.

10 10. In a wire ring forming machine, means for first feeding wire forwardly a short distance, means for then gripping the end of the wire and drawing it outwardly and forming it into a loop having overlapping ends, the forming means being located entirely within the finished loop.

15 11. In a wire ring forming machine, means for first feeding wire forwardly a short distance, means for then gripping the end of the wire and drawing it outwardly and forming it into a loop having overlapping ends, means for twisting the overlapping loop ends together to form a ring, and means for bodily moving the forming means and the loop to the twisting means without disturbing the relation between the loop and the former.

20 12. In a wire ring forming machine, means for first feeding wire forwardly a short distance, a two-part forming means, means for then gripping the end of the wire and drawing it outwardly and forming it into a loop having overlapping ends, and means for

twisting the overlapping loop ends together to form a ring.

13. In a wire ring forming machine, means for first feeding wire forwardly a short distance, a two-part forming means for then gripping the end of the wire and drawing it outwardly and forming it into a loop having overlapping ends, means for twisting the overlapping loop ends together to form a ring, and means for separating the two parts of the forming means to permit the finished ring to escape.

14. In a wire ring forming machine, means for gripping the end of the wire drawing it outwardly and forming it into a loop having overlapping ends, and means for twisting the overlapping loop ends together to form a ring.

In testimony whereof we affix our signatures in presence of two witnesses.

ERNEST TRUMAN.  
AUGUST TIETZ.

Witnesses:

CLAYTON MURPHY,  
LEONE KIBURTZ.