

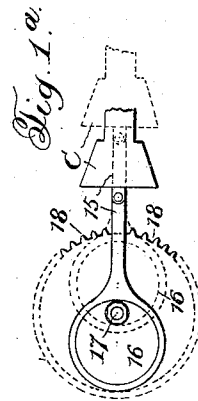
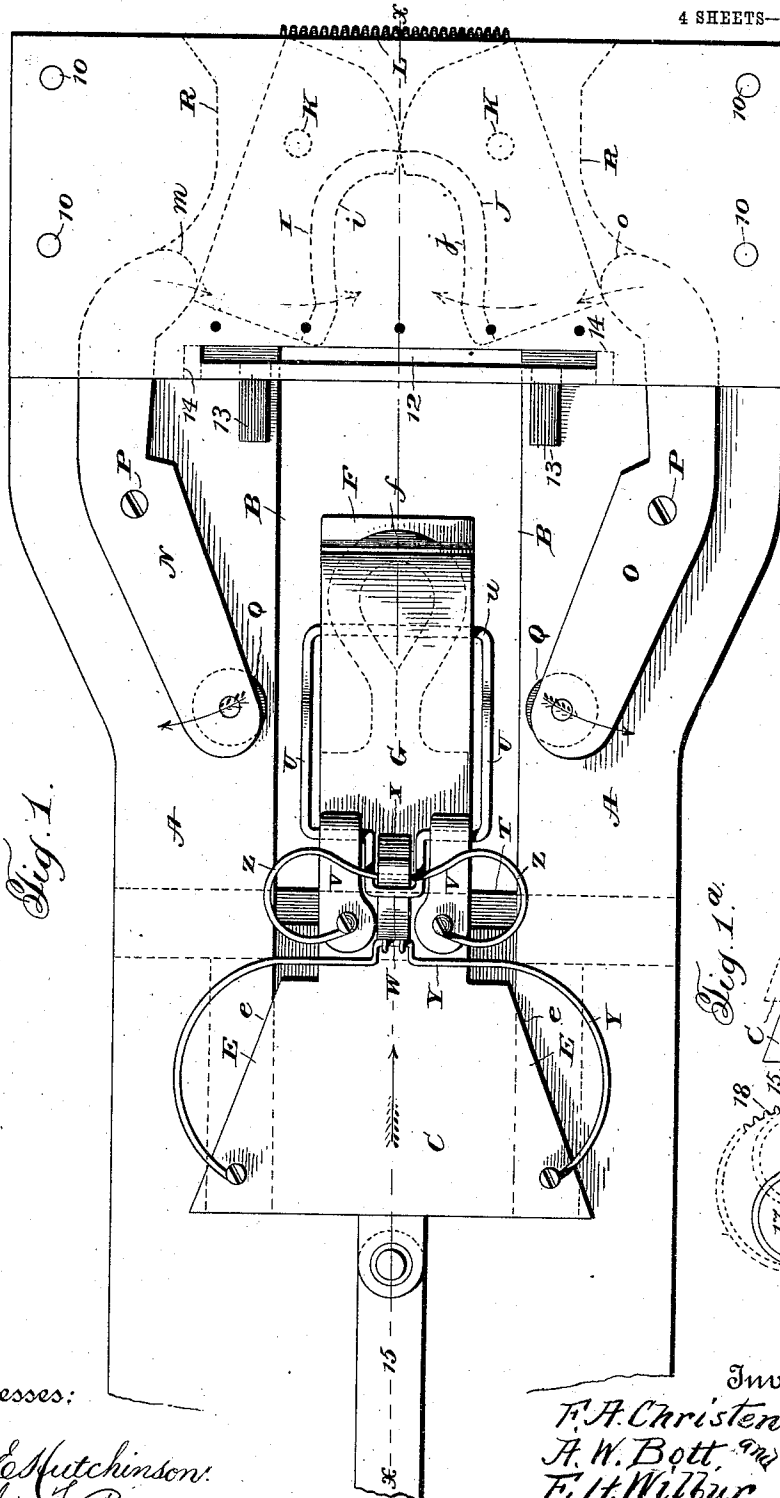
No. 843,000.

PATENTED FEB. 5, 1907.

F. A. CHRISTENSEN, A. W. BOTT & E. H. WILBUR.  
THIMBLE FORMING MACHINE.

APPLICATION FILED JULY 23, 1906.

4 SHEETS—SHEET 1.



Witnesses:

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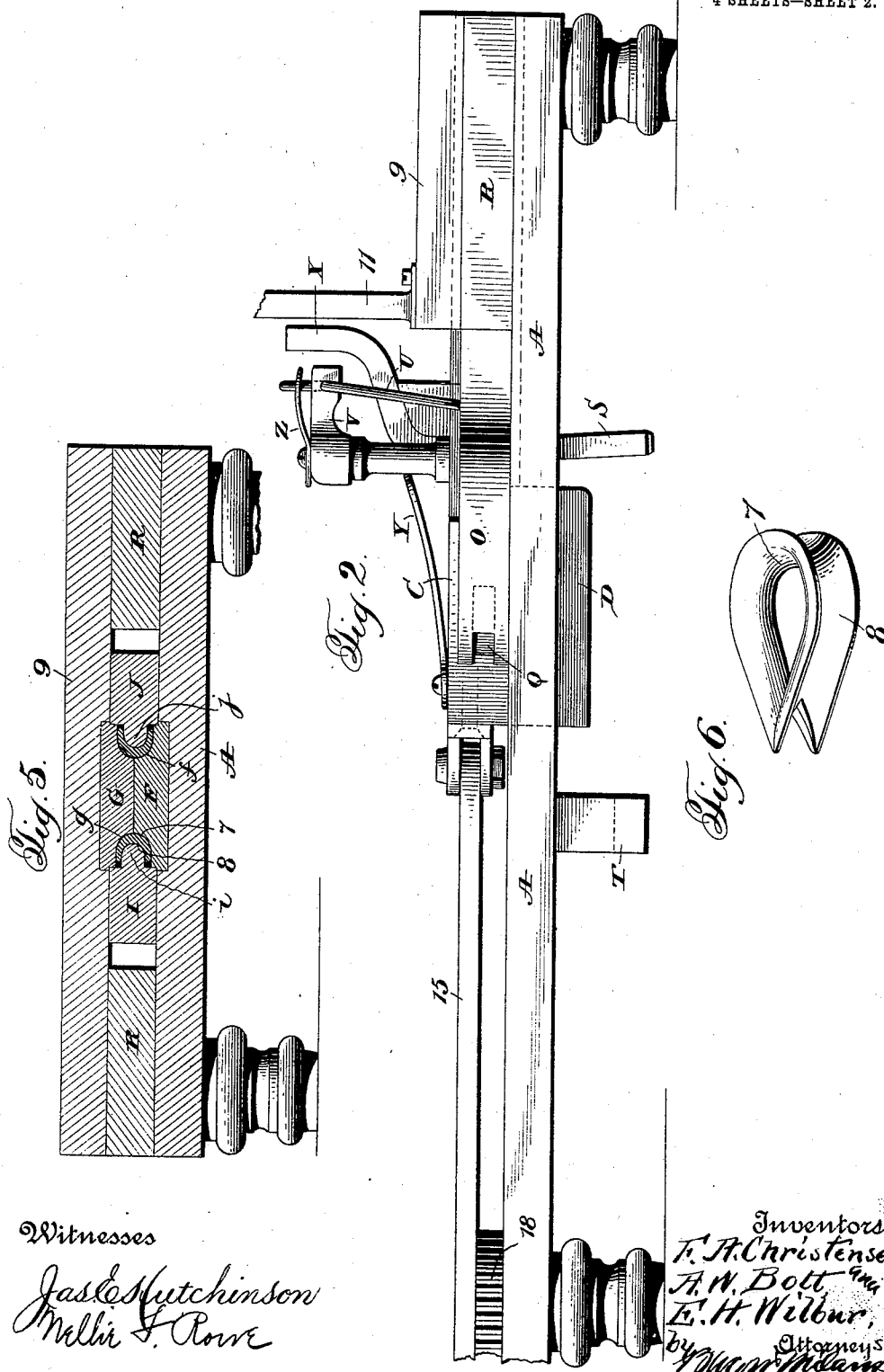
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4 SHEETS—SHEET 2.



Witnesses

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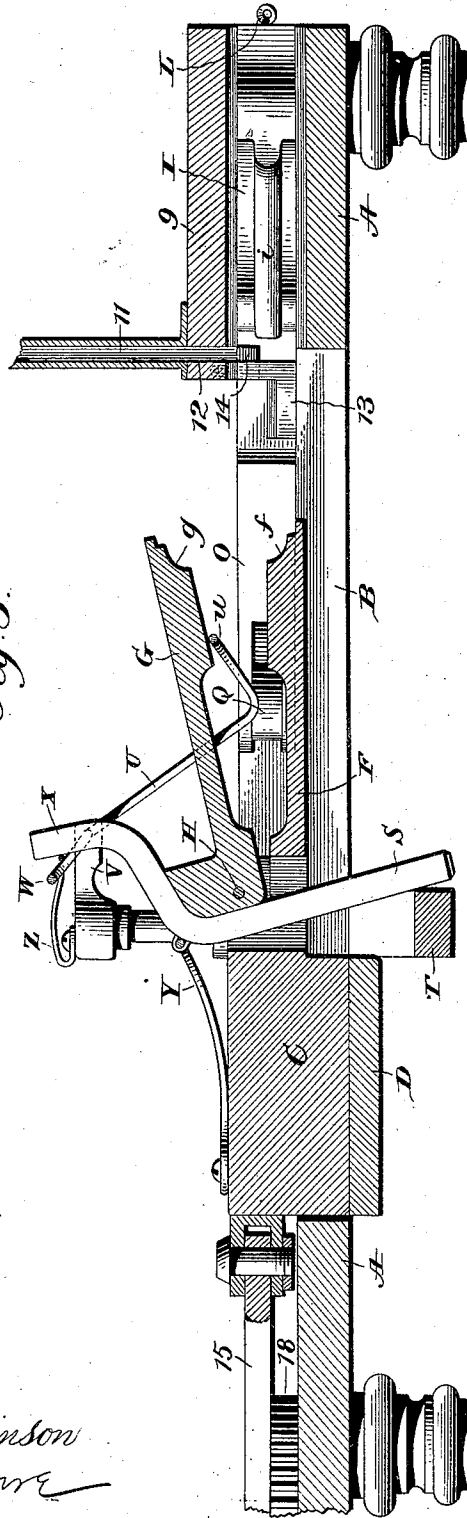
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4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

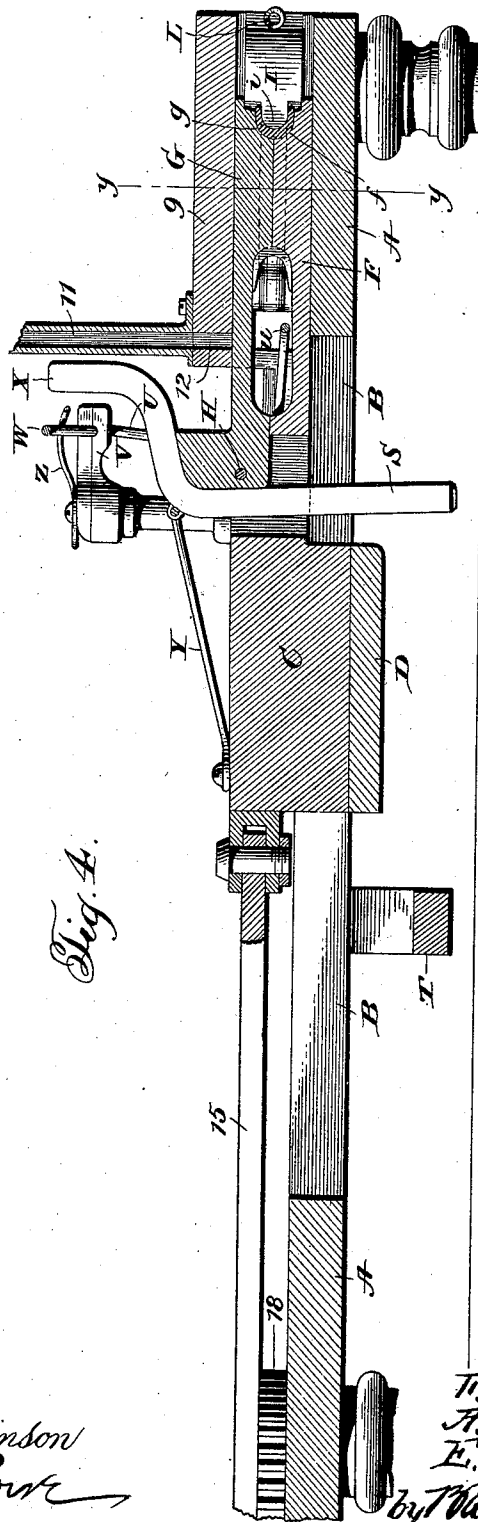


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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OF PORTLAND, MAINE, ASSIGNORS TO THE THOMAS LAUGHLIN COM-  
PANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

## THIMBLE-FORMING MACHINE.

No. 843,000.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed July 23, 1906. Serial No. 327,345.

*To all whom it may concern:*

Be it known that we, FREDERICK A. CHRIS-  
TENSEN and ANDREW W. BOTT, both citi-  
zens of the United States, residing at Port-  
land, in the county of Cumberland and State  
of Maine, and EDWIN H. WILBUR, a subject  
of the Kingdom of Great Britain, residing in  
the United States, at Portland, in the county  
of Cumberland and State of Maine, have in-  
vented certain new and useful Improve-  
ments in Thimble-Forming Machines, of  
which the following is a specification, refer-  
ence being had therein to the accompanying  
drawings.

This invention relates to improvements in  
thimble-forming machines, and has for its  
primary object the provision of a machine of  
this character which will be simple in con-  
struction, durable, and easily and speedily  
operated.

The invention comprehends a machine pro-  
vided with a core member and complemen-  
tary outside forming members adapted to  
bend a strip or bar of metal into the desired  
thimble configuration therebetween, and  
more specifically a core member of separable  
sections and pivotally-mounted outside mem-  
bers adapted to open and close upon the core  
member, the direction of opening of said out-  
side members being in a plane at right an-  
gles to the direction of separation of the said  
separable core member.

The invention also embraces means for au-  
tomatically opening and closing the sepa-  
rable core and outside forming members,  
also means for ejecting the completed thim-  
bles from the core member.

The invention also includes in combina-  
tion thimble-forming instrumentalities and  
means whereby the machine may be contin-  
uously operated and blanks automatically fed  
to said forming instrumentalities.

All of the foregoing, as well as other novel  
features of the machine, especially the de-  
tails of construction and arrangement of the  
several parts, will be apparent from the de-  
tailed description hereinafter contained when  
read in connection with the accompanying  
drawings, forming part hereof, and wherein a  
convenient embodiment of the invention is  
illustrated.

In the drawings, Figure 1 is a top plan  
view of the machine. Fig. 1<sup>a</sup> is a detail of  
the actuating means. Fig. 2 is a side eleva-  
tion. Fig. 3 is a longitudinal sectional view  
on the line *x x* of Fig. 1, the parts being  
shown in open position. - Fig. 4 is a similar  
view, the parts being shown in closed posi-  
tion. Fig. 5 is a transverse sectional view on  
the line *y y* of Fig. 4, and Fig. 6 is a perspec-  
tive view of the article formed by the ma-  
chine.

Referring more specifically to the draw-  
ings, wherein like reference characters refer  
to corresponding parts in the several views,  
A designates a supporting base or frame,  
which may be of any suitable design, pro-  
vided with an open central portion B for a  
purpose as will presently appear.

C is a slidable carrier mounted within the  
open central portion B, provided with flanges  
D, underlying the side portions of the frame  
A, and flanges E, overlying the same, where-  
by to maintain the carrier in horizontal posi-  
tion while permitting the same to be recip-  
rocated back and forth within said open cen-  
tral portion, the said side portions of the  
frame constituting guides for this carrier.

Projecting forwardly from the carrier C is  
one member of the forming mechanism—in  
this instance the core member—which, as  
hereinbefore suggested, is composed of sepa-  
rable sections, F representing the bottom  
section of the same, which is rigidly secured  
to the carrier C, and G the upper section  
thereof, which is pivotally secured at its rear  
end, as indicated at H, to said carrier, where-  
by to swing and open or close the core mem-  
ber in a vertical direction. Of course the  
shape of this core member is made comple-  
mentary to the interior contour of the article  
to be formed, that shown being pear-shaped  
with slightly-concaved flanges *f g*, whereby  
to form a thimble with convexed inner sur-  
face 7 and grooved or concaved outer surface  
8, as shown in Fig. 6.

I and J are oppositely-disposed forming  
members or jaws each pivotally mounted on  
the forward portion of the frame A, as at K,  
to approach or recede from each other in a  
horizontal direction in the same plane as  
that occupied by the core member, the inner

surfaces of these forming members or jaws being ribbed, as at *i j*, and formed complementary to the core member, as will be clear from the drawings. The forming members I J, just referred to, are adapted to be held in separated or open position through the medium of a contracting coiled spring L, secured to the outer ends of said jaws. To force the said forming members or jaws toward each other, whereby to embrace the core member to form the article therebetween, I provide oppositely-disposed levers N and O, pivoted at P intermediate their ends to the base A, whereby to engage at their forward ends *m o* with the inner ends of the jaw members and at their rear ends to be engaged by and ride upon beveled surfaces *e* on the flanges E of the carrier C, anti-friction-rollers Q being afforded for this purpose. It will be noted that the beveling of the edges of the flanges E as just described converts the upper portion of the carrier C into a wedge pointing forwardly, which when forced between the rear ends of the levers N O incident to the forward movements of the carrier toward and into the core member will spread said rear ends of the levers and correspondingly force inwardly the forward ends *n o* thereof into engagement with the inner ends of the jaw members I J, whereby to compress or close said jaw members against the tension of the spring L upon the core member, which latter during the cycle of movement has entered into proper position between said jaws. Blocks R on the base A constitute abutments limiting the movement of the levers N and O, so that their rear ends will always be in position to be engaged by the wedge of the carrier.

On the upper section G, I provide a rigid depending tailpiece S, adapted in the rear movement of the carrier to come in contact with a trip T, arranged transversely on the bottom of the frame or base A, to elevate the said upper section of the separable core member to permit the ejection of a completed article by means of the devices now to be pointed out.

U is the ejecting element, which is preferably a wire yoke offset forwardly at its lower end, as at *u*, to pass through the separable core member near the rear end thereof, said yoke being pivoted at its upper end in brackets V, secured to the upper surface of the carrier C, whereby to normally freely suspend therefrom, and having an extension W projecting upwardly through the space intermediate the brackets V, whereby a lever is formed of the ejector. To operate this lever to eject the article from the core member, an arm X is projected upwardly from the upper section G of the core member into such a position that when the tailpiece S contacts

with the trip T during the rearward movement of the carrier the arm X will engage the upper end W of the lever-ejector to throw the lower end or yoke portion thereof forwardly and force the article out of the separable core, when said article may drop through the open space B, which is now unobstructed, intermediate the core member and the jaw members I and J. When the carrier starts on its return movement in a forward direction and the tailpiece S recedes from the trip T, springs Y and Z engaging the arm X will force said arm forwardly and close down the upper section G of the core member, permitting the lever-ejector to swing to its initial position by force of gravity, it being observed that the springs Y and Z were previously compressed incident to the rearward movement of the arm X upon opening of the upper section of the core member.

9 is a cover-plate for the jaws I and J and associated mechanism removably secured through the medium of bolts 10 to the blocks R, and upon this cover-plate I mount a hopper 11, opening to an elongated transversely-disposed slot 12, passing through the cover-plate on a line directly above the entrance for the core member between said jaws, said slot being designed to guide the bars of metal placed in the hopper, and which are preferably previously heated to the desired degree for bending to secure the best results, to a position resting upon the base A and across said entrance between the jaws to be engaged by the core member in its forward movement and by said jaws in their closing movement upon the core. Weighted gravity-retainers 13, one at each side of the open space B and near the ends of the slot 12, are pivotally suspended from the edge of the cover-plate 9, whereby to hold the bar of metal in proper position and against any tendency to tilt away from the jaws, depending lugs 14 on the cover-plate at the ends of the slot 12 preventing the bars from longitudinal or endwise displacement.

Any convenient mechanism may be provided to effect the desired reciprocation of the carrier C and the parts carried thereby, that shown comprising a link 15, engaging an eccentric 16, fixed to the shaft 17 of a driving-gear 18, driven from any convenient source of power.

While I have herein referred to the formation of thimbles, it will be readily appreciated by those skilled in the art that the machine with slight or no changes within the spirit of the invention is susceptible of other uses.

I claim—

1. In a machine of the character described, a separable core member, complementary outside forming members, means for actuating the parts to cause the outside forming

members to embrace the core member to shape the material therebetween, and means for automatically opening the core.

2. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member into position between or away from said outside forming members, and means controlled by said shifting means for forcing said outside forming members into engagement with the core member to form the material therebetween including pivoted levers mounted independently of said forming members engaging said forming members, and a wedge on the carrier adapted to engage said levers to force the forming members into operating engagement with the core member.

3. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member into position between or away from said outside forming members, means controlled by said shifting means for forcing said outside forming members into engagement with the core member to form the material therebetween including pivoted levers mounted independently of said forming members engaging said forming members, a wedge on the carrier adapted to engage said levers to force the forming members into operating engagement with the core member, and means for normally opening the forming members.

4. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member to a position between or away from said forming members, means for causing the forming members to engage the core member to bend the material therebetween, means for feeding the blank to be bent comprising a guide for delivering the same at a point in advance of the entrance to the forming members, and means for preventing displacement of the blank in a direction away from the forming members comprising retainers adapted to engage the side of the blank opposite to that which faces the forming members.

5. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member to a position between or away from said forming members, means for causing the forming members to engage the core member to bend the material therebetween, means for feeding the blank to be bent comprising a guide for delivering the same at a point in advance of the entrance to the forming members, and means for preventing displacement of the blank in a direction away from the forming members, comprising freely-swinging gravity-retainers adapted to engage the

side of the blank opposite to that which faces the forming members.

6. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member to a position between or away from said forming members, means for causing the forming members to engage the core member to bend the material therebetween, means for feeding the blank to be bent comprising a guide for delivering the same at a point in advance of the entrance to the forming members, and instrumentalities for preventing displacement of the blank in a direction away from the forming members or in a direction longitudinal of the blank, comprising freely-swinging gravity-retainers adapted to engage the side of the blank opposite to that which faces the forming members, and lugs depending from the ends of the guide adapted to abut the ends of the blank.

7. In a machine of the character described, a core member of separable sections, complementary outside forming members adapted to open and close upon the core member, the direction of opening of said outside members being in a plane at right angles to the direction of separation of said separable core member, and means for automatically opening said core member after the forming operation.

8. In a machine of the character described, a core member of separable pivoted sections, complementary pivoted outside forming members adapted to open and close upon the core member, the direction of opening of said outside members being in a plane at right angles to the direction of separation of the said separable core member, and means for automatically opening said core member after the forming operation.

9. In a machine of the character described, a core member of separable sections, complementary outside forming members, and means for automatically opening and closing the sections of the core member and the outside forming members.

10. In a machine of the character described, a horizontally-disposed core member, complementary outside forming instrumentalities for bending material around the core member, means for actuating said forming instrumentalities, and means for ejecting the completed article from the core member including a kicker, and means for actuating the kicker whereby in its ejecting movement it moves in part upwardly from the horizontal plane of the core member to throw the article upwardly off from the core member.

11. In a machine of the character described, a core member of separable sections, complementary outside forming members, means for opening and closing said core-sections and outside forming members, and

means for ejecting the completed article from the core when opened.

12. In a machine of the character described, a core member, complementary outside forming members, means for forcing the forming members into engagement with the core member, and means for actuating the core member to shift the same to a position between or away from the forming members, means for feeding the blank to a position between the core member and forming members, when separated, and means for ejecting the completed article from the core member, comprising a kicker at the rear of the core member arranged to engage the article thereon, and means for actuating the same to throw the article upwardly and off from said core member, whereby the machine may be continuously operated.

13. In a machine of the character described, a core member having a hinged section, complementary forming members adapted to engage the core member, means for actuating said forming members, and means for automatically opening the hinged section of the core member to permit extraction of the completed article when the forming members are open.

14. In a machine of the character described, a core member having a hinged section, complementary forming members adapted to engage the core member, means for actuating said forming members, and means for opening the hinged section of the core member to permit extraction of the completed article when the forming members are open, in combination with an ejector and means for automatically operating the same when said hinged section is opened.

15. In a machine of the character described, a core member having a hinged section, complementary forming members adapted to engage the core member, means for actuating said forming members, and means for opening the hinged section of the core member to permit extraction of the completed article when the forming members are open, in combination with an ejector, means for automatically operating the same when said hinged section is opened, and means for automatically restoring the parts to their normal or initial position.

16. In a machine of the character described, forming mechanism including a core member of separable sections, an ejector operatively associated therewith, and means for opening said core member and operating said ejector.

17. In a machine of the character described, forming mechanism including a core member having a pivoted section, an ejector operatively associated with said core member, and means for opening said hinged section of the core member and for operating said ejector.

18. In a machine of the character described, forming mechanism including a core member having a pivoted section, an ejector operatively associated with said core member, and means for opening said hinged section of the core member and for operating said ejector, comprising a tailpiece on said hinged section, a trip therefor, and an arm on said hinged section adapted to engage the ejector.

19. In a machine of the character described, forming mechanism including a core member having a pivoted section, an ejector operatively associated with said core member, and means for opening said hinged section of the core member and for operating said ejector, comprising a tailpiece on said hinged section, a trip therefor, and an arm on said hinged section adapted to engage the ejector, and means for restoring the parts to their initial or normal position.

20. In a machine for forming thimbles, a core member of separable sections, complementary forming members, a carrier for shifting the core member to a position between or away from the forming members, means for discharging a blank at a point in advance of the forming members, means operatively associated with the carrier for causing the forming members to engage the core member when the latter occupies a position between the former, an ejector operatively associated with the core member, and instrumentalities for opening the core member and for operating said ejector upon withdrawal of the core member from the forming members.

21. In a machine for forming thimbles, a core member having a hinged section, complementary forming members, a carrier for shifting the core member to a position between or away from the forming members, means for discharging a blank at a point in advance of the forming members, means operatively associated with the carrier for causing the forming members to engage the core member when the latter occupies a position between the former, an ejector operatively associated with the core member, and instrumentalities for opening the hinged section of the core member and for operating said ejector upon withdrawal of the core member from the forming members.

22. In a machine of the character described, forming mechanism including a core member of separable sections, and means for automatically opening said core member after the forming operation.

23. In a machine of the character described, forming mechanism including a shiftable core member, means carried by

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said core member for ejecting an article from the core; and means for actuating the ejecting means by the movement of the core member.

24. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member into a position between or away from said forming members, means for causing the forming members to engage the core member to bend the material therebetween, and means for maintaining a blank in place at a point in advance of the entrance to the forming members comprising movably-mounted retainers adapted to engage the side of the blank opposite to that which faces the forming members.

25. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member into a position between or away from said forming members, means for causing the forming members to engage the core member to bend the material therebetween, and means for maintaining a blank in place at a point in advance of the entrance to the forming members comprising yieldable retainers adapted to engage the side of the blank opposite to that which faces the forming members.

26. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member into position between or away from said outside forming members, and means for forcing said outside forming members into engagement with the core member to form the material therebetween including pivoted levers mounted independently of said forming members engaging said forming members, and means movable independently of and arranged to engage said levers to force the forming members into engagement with the core member.

27. In a machine of the character described, a core member, complementary pivotally-mounted outside forming members, means for shifting the core member into position between or away from said outside forming members, and means for forcing said outside forming members into engagement with the core member to form the material therebetween including pivoted levers mounted independently of said forming members engaging said forming members, and means movable independently of and arranged to engage said levers to force the forming members into engagement with the core member.

28. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member into position between or away from said outside forming members, and

means for forcing said outside forming members into engagement with the core member to form the material therebetween including pivoted levers mounted independently of said forming members engaging said forming members, and means movable independently of and arranged to engage said levers to force the forming members into engagement with the core member, in combination with a single means for automatically opening said forming members and their actuating-levers.

29. In a machine of the character described, a core member, complementary pivotally-mounted outside forming members, means for shifting the core member into position between or away from said outside forming members, and means for forcing said outside forming members into engagement with the core member to form the material therebetween including pivoted levers mounted independently of said forming members engaging said forming members, and means movable independently of and arranged to engage said levers to force the forming members into engagement with the core member, in combination with a spring connecting the pivotally-mounted forming members for automatically opening the same and their actuating-levers.

30. In a machine of the character described, a supporting-frame, forming members pivotally mounted on said frame, a core member, a carrier and means operatively associated therewith for shifting the core member into a position between or away from the forming members, levers also pivotally mounted upon said frame adapted to engage the forming members at one end, and inclined portions on the said carrier adapted to engage the opposite ends of the levers to force the forming members upon the core member when the latter is therewithin.

31. In a machine of the character described, a supporting-frame, forming members pivotally mounted on said frame, a core member, a carrier and means operatively associated therewith for shifting the core member into a position between or away from the forming members, levers also pivotally mounted upon said frame adapted to engage the forming members at one end, and inclined portions on the said carrier adapted to engage the opposite ends of the levers to force the forming members upon the core member when the latter is therewithin, in combination with means for opening the forming members and actuating-levers when the core is withdrawn from the forming members.

32. In a machine of the character described, a core member, complementary outside forming members, means for shifting the core member into a position between or

away from said forming members, means for  
causing the forming members to engage the  
core member to bend the material therebe-  
tween, a frame or base member upon which  
5 a blank may rest, and means for maintaining  
the blank in place at a point in advance of  
the entrance to the forming members com-  
prising retaining instrumentalities adapted  
to engage the side of the blank opposite to  
10 that which faces the forming members, the  
frame of the machine opposite the base mem-

ber being formed with a way through which  
the blanks may be inserted.

In testimony whereof we affix our signa-  
tures in presence of two witnesses.

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ANDREW W. BOTT.  
EDWIN H. WILBUR.

Witnesses:

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GEO. B. BOUTWELL.