(No Model.) W. HARTY. 2 Sheets—Sheet 1.

MECHANISM FOR FINISHING THE ENDS OF SPRINGS FOR RECEIVING BUSHING.

No. 309,851. Patented Dec. 30, 1884.

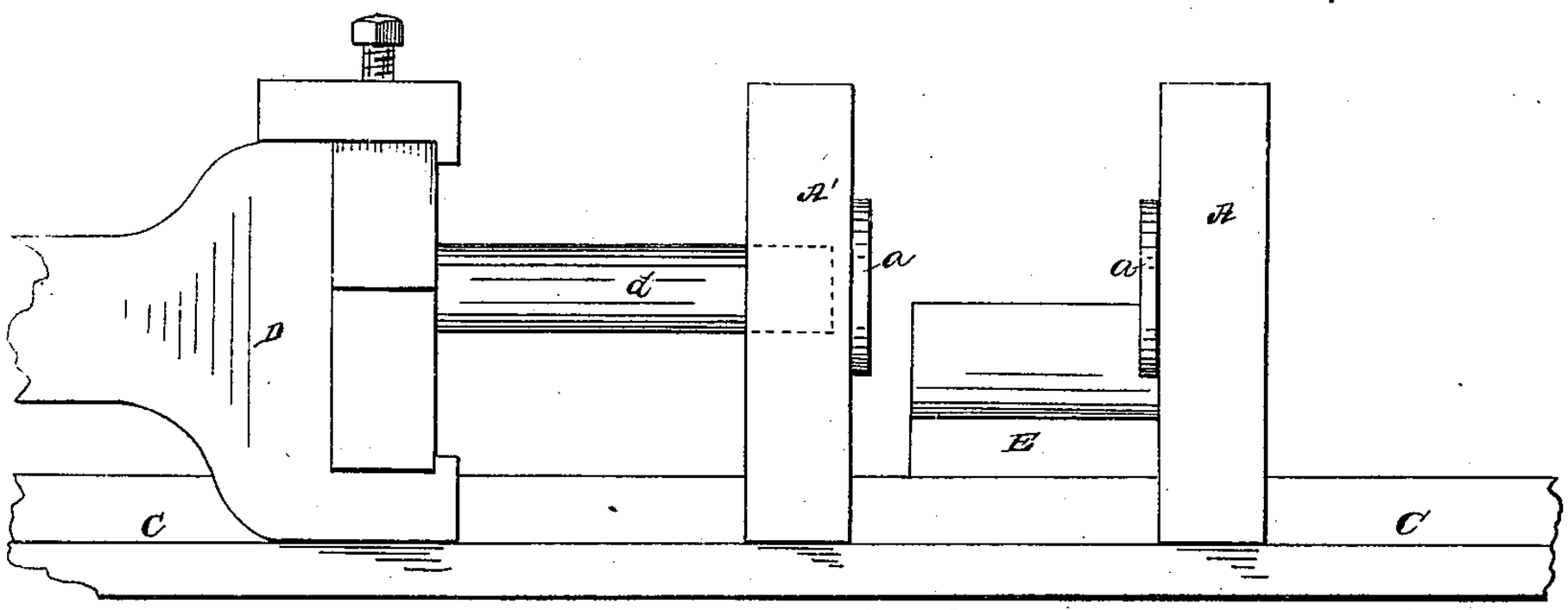

Fig. 1.

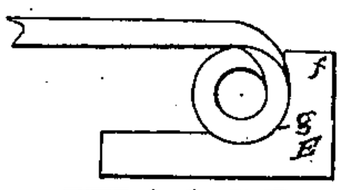

Fig. 1a.

Fig. 2.

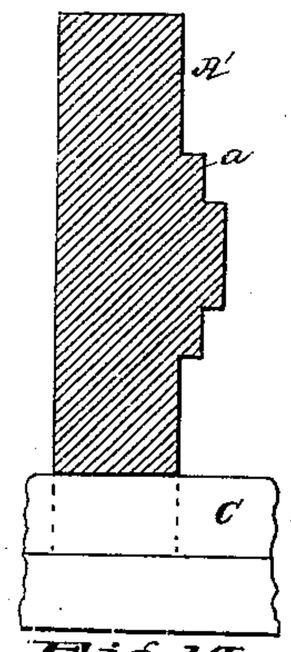

Fig. 14

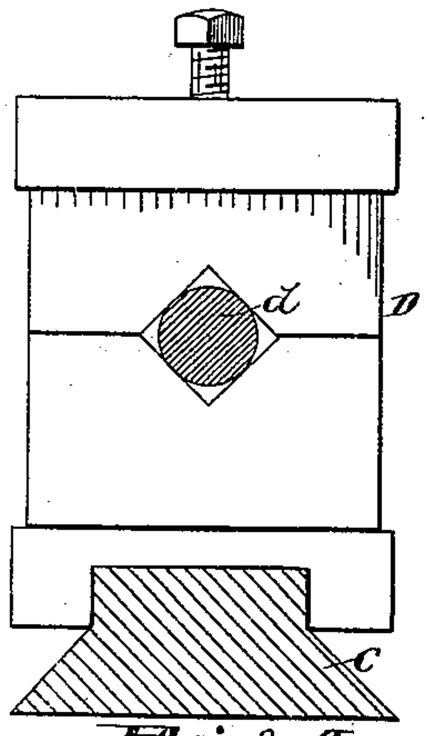

Fig. 4.

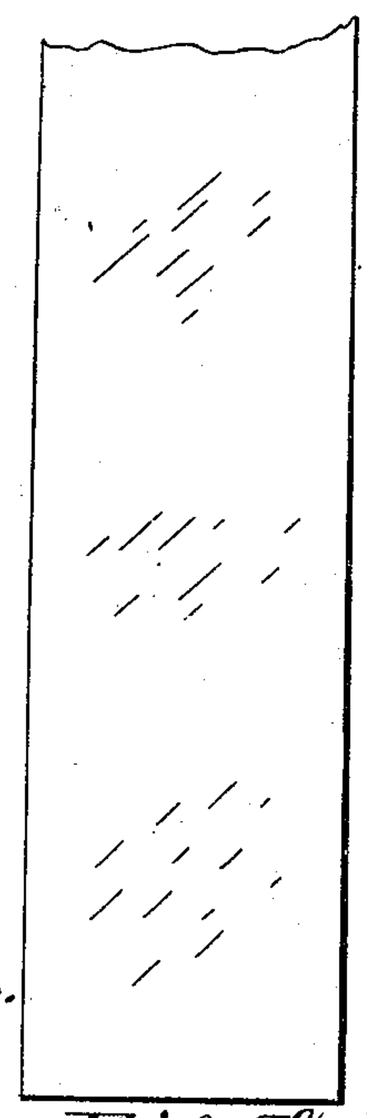

Fig. 4a.

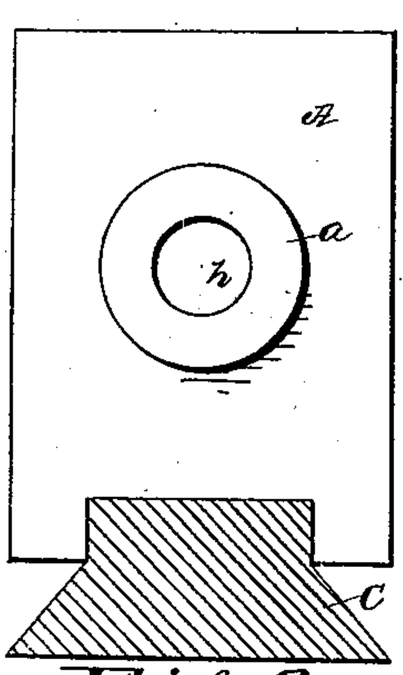

Fig. 3.

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John. W. Strehli.

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(No Model.) 2 Sheets—Sheet 2.

W. HARTY.

MECHANISM FOR FINISHING THE ENDS OF SPRINGS FOR RECEIVING BUSHING.

No. 309,851. Patented Dec. 30, 1884.

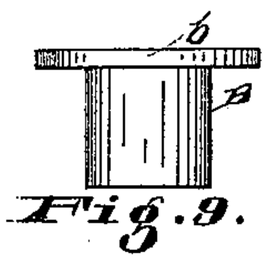

Fig. 9.

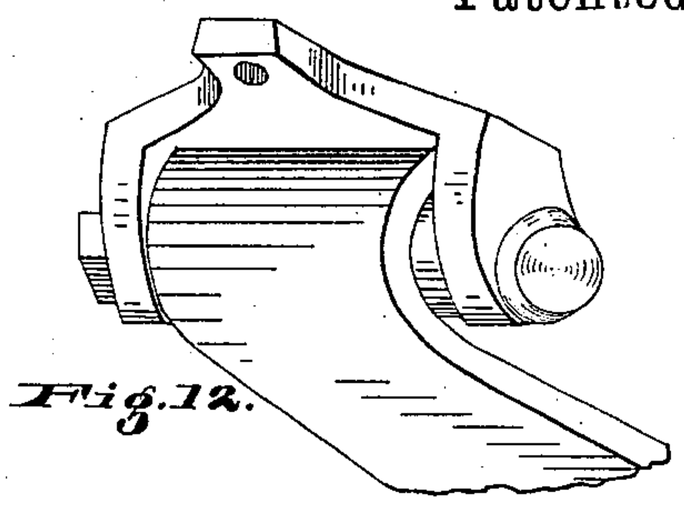

Fig. 12.

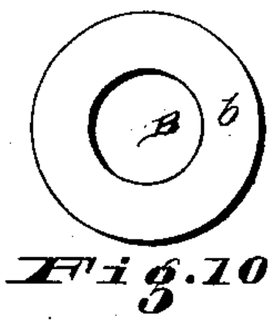

Fig. 10.

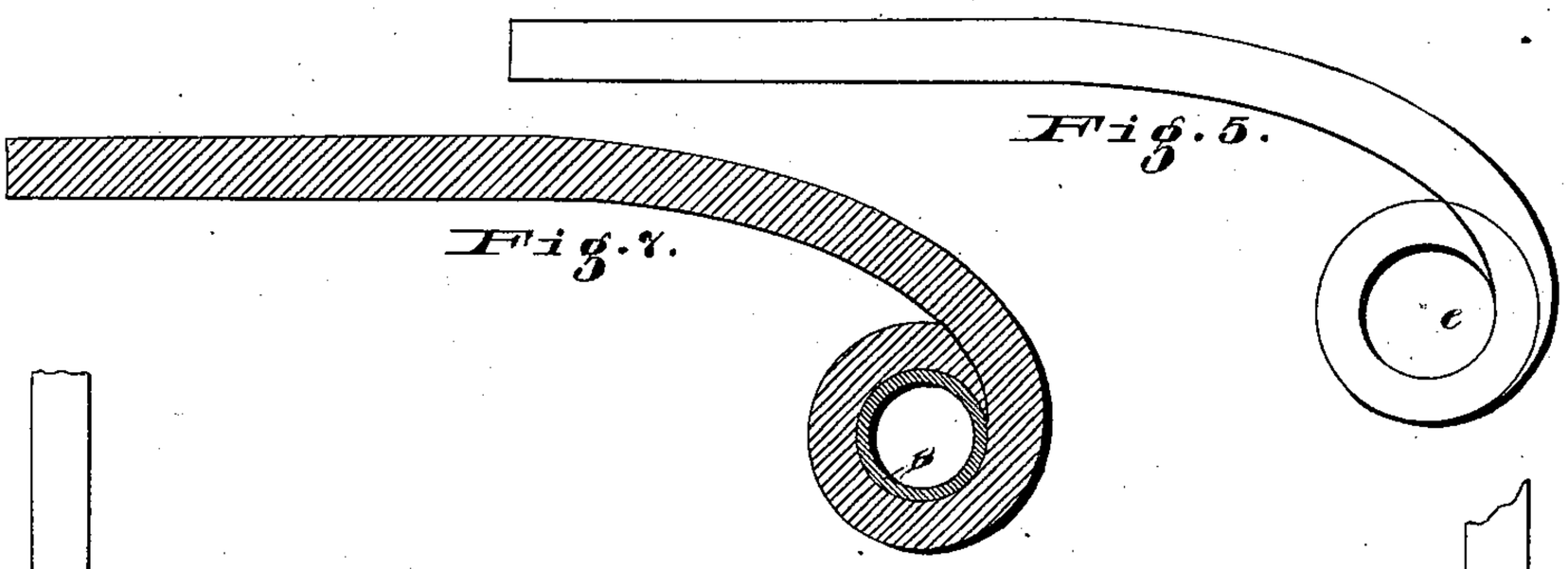

Fig. 5.

Fig. 7.

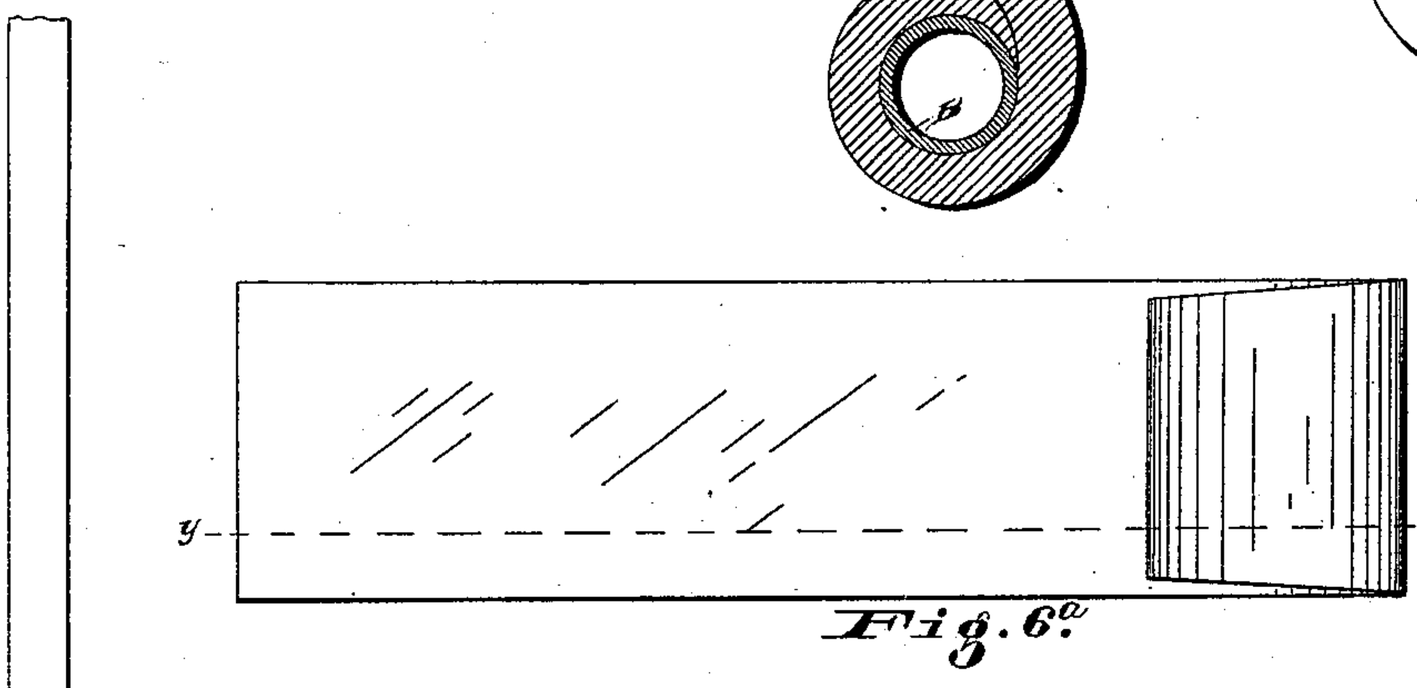

Fig. 6a.

Fig. 4b.

Fig. 4c.

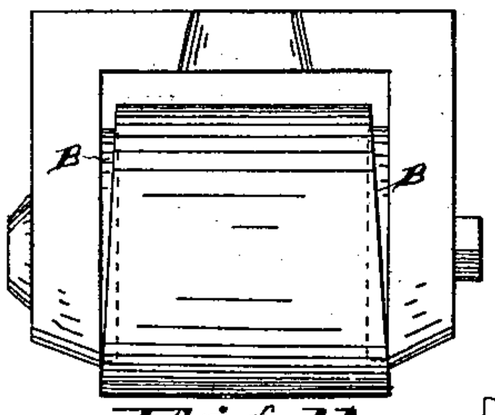

Fig. 11.

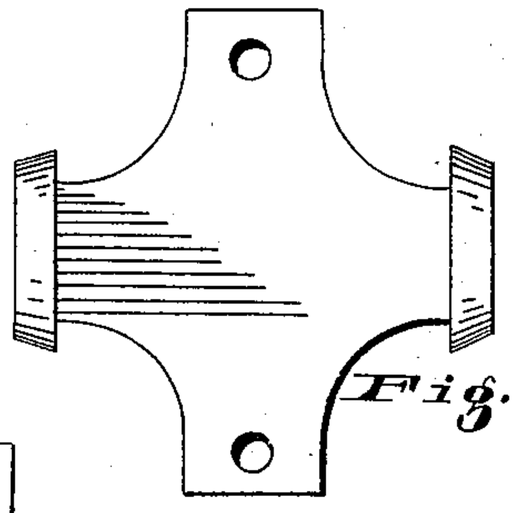

Fig. 8.

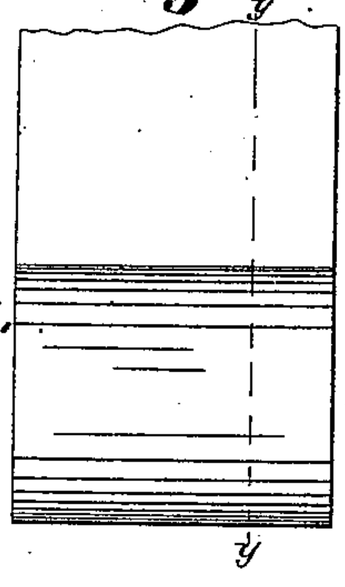

Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM HARTY, OF PORTSMOUTH, OHIO.

MECHANISM FOR FINISHING THE ENDS OF SPRINGS FOR RECEIVING BUSHING.

SPECIFICATION forming part of Letters Patent No. 309,851, dated December 30, 1884.

Application filed February 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HARTY, a resident of Portsmouth, in the county of Scioto and State of Ohio, have invented certain new and useful Improvements in Mechanism for Finishing the Ends of Springs for Receiving Bushing, of which the following is a specification.

My invention relates particularly to the method for forming the impressions at either side of the eye, into which impressions bushings or washers are inserted when the spring-eye is placed in the shackle. Heretofore the impressions have been bored or drilled after the eye has been formed and the metal is cold. My invention enables these impressions to be formed by dies at the same heat in which the eye is formed.

Referring to the drawings forming part of this specification, Figure 1 represents the dies for forming the impressions, and one form of mechanism for causing the dies to approach each other, the dies being in a position to receive a spring-eye between them. Fig. 2 represents the same mechanism as shown in Fig. 1, the dies being in cross-section, and a spring-eye, also in cross-section, being shown in position and subjected to the action of the dies forming the impression. Fig. 3 represents the face of one of the dies. Fig. 4 represents the front end or face of the plunger which advances the movable die. Fig. 4^a represents a plan view of the flat of the blank of the spring before the eye has been turned thereon. Fig. 4^b represents a view of the edge of the blank of even thickness. Fig. 4^c represents a view of the edge of the blank, preferably tapered at the end, as shown. Fig. 5 is an elevation of the edge of the end of spring after it has been subjected to the action of my invention. Fig. 6 is a top view of the end of a spring, showing how the same appears when the blank is of even thickness, as shown in Fig. 4^b, and has been subjected to the action of my invention. Fig. 6^a is a top view of the end of spring, showing how the same appears when the end of the blank has a taper substantially such as shown in Fig. 4^c, and has been subjected to the action of my invention. Fig. 7 is a longitudinal vertical section of the end of the spring shown in Figs. 6 and 6^a, with the shank of the bushing in position in the eye, said section being taken at the dotted line *y y* of said figures. Fig. 8 represents the shackle to which the spring is to be connected. Figs. 9 and 10 represent the bushing, Fig. 9 being a side elevation, and Fig. 10 front end elevation, of same. Fig. 11 is an end view of the spring and the shackle with the bushing and connecting-bolt in position. Fig. 12 is a perspective view of the same. Fig. 13 is a view of a combined rest and stop for supporting the end of the spring having the spring-eye, and aiding in retaining said end of the spring in position for the dies to act thereon; and Fig. 14 is a sectional elevation of one of the dies, showing a preferred modification to be employed under certain conditions, hereinafter specified.

A A′ are the dies between which the spring-eye is pressed. On the face of each of these dies is a circular projection, *a*, of a diameter equal to the diameter of the flange *b* of the bushing B. One of these bushings is placed at each side of the eye of the spring, (the shank of the bushing entering the hole of the eye,) to form an even bearing between the eye and the shackle, and each of the dies A A′ is therefore provided with a projection, *a*, for forming a recess at each side of the eye.

Any desired means for causing the dies to approach each other may be employed, and suitable guideways are to be provided to enable the dies to be properly brought together and to be properly separated, a convenient and simple mechanism for this being that shown in the drawings, viz: A guide, C, is connected to a suitable support, and one of the dies, as A, is rigidly attached to the upper side of this guide, the other die being capable of sliding back and forth on said guide. The faces of these dies are placed toward each other, as shown. Behind the movable or sliding die is a plunger or pitman, D, which is caused to move back and forth by any appropriate mechanism. To the front end of this pitman is connected a pin, *d*, adapted to pass through the eye of the spring; and this pin *d* also passes through a central opening, *h*, in the die A′. The diameter of this pin *d* is preferably of the same diameter as is the hole *e* of the said eye.

Between the dies A and A′ is placed a block, E, upon which the eye of the spring may rest before the dies are caused to approach each other, and the thickness of this block is such

that when the eye of the spring is placed thereon the opening in said eye will be opposite the end of the pin *d*, so that as the pitman D is advanced this pin will enter and pass through the hole *e* in the eye. This rest block or bed (see Fig. 13) is preferably provided with a projection or stop, *f*, and a depression, as *g*, the depression *g* receiving the eye of the spring, the end of the eye resting against the stop *f*, and by means of the latter is prevented, when introduced between the dies, from slipping beyond the position necessary for it to occupy while subjected to the action of the dies. As the pitman D is advanced the pin enters the hole *e* of the eye. The forward end or face of the pitman comes in contact with the die A′ and causes it to approach the die A, and the circular projections *a* on the dies thus sink into the sides of the eye, as shown in Fig. 2, and the pin *d* preserves the shape and size of the hole or opening *e* through the eye while the impressions are being formed at the sides of the eye by the projections *a* on the dies. When the impressions have been formed, the pitman D is retracted, and this withdraws the pin *d* from the eye of the spring.

When desired, mechanism may be employed for retracting the die A′—as, for instance, a suitable spring.

The pin *d* may be replaced by others of different diameters for finishing spring-eyes of different sizes. If desired, the pin *d* may be omitted, and each die A and A′ will then be preferably provided (see Fig. 14) with a central projection springing from the center of each circular projection *a*, as shown in Fig. 14, these central projections on the opposite dies being adapted to enter the opening *e* through the spring-eye when the dies are forming the impressions at the sides of the eye. By this method of finishing the eyes of springs but one handling is necessary, as the spring is transferred directly from the machine which forms the eye to the dies A and A′, by which the impressions at either side of the eye are formed while the metal is yet hot, thus saving considerable time.

The spring-blank may be of uniform thickness throughout, a chamfer or bevel, *p*, being preferably provided, as is usual, at the end, (see Figs. 4ᵇ and 4ᶜ;) but I prefer that that portion of the end part which is to enter in the formation of the eye, or the greater portion thereof, should be tapered—that is, diminished in thickness toward the end. Such a taper or tapered portion, *m*, is particularly shown in Fig. 4ᶜ. The principal reason why I prefer such part should be tapered is because the action of the dies A and A′ will then be such that no large fins will be formed upon the edge of the eye, and thus the waste of metal caused by their unnecessary presence is obviated.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. The herein-described dies for forming impressions in the sides of spring-eyes, consisting of the main beds or pieces A A′, each of said bodies being provided with the projections *a*, facing each other, and shaped to enter and form the recesses in the sides of the spring-eye for the reception of the bushing, piece A′ being movable, in combination with pitman D, substantially as and for the purposes specified.

2. The herein-described dies for forming impressions in the sides of spring-eyes, consisting of the main beds or pieces A A′, each of said bodies being provided with the circular projections *a*, facing each other, and shaped to enter and form the recesses in the sides of the spring-eye for the reception of the bushing, piece A′ being movable, in connection with pitman D, substantially as and for the purposes specified.

3. The dies A A′, each provided with a circular projection, *a*, for forming the impressions at the sides of a spring-eye, and having a centrally-located opening, *h*, for the passage of pin *d*, in combination with said pin *d*, adapted to enter the opening through said spring-eye, and there remaining while the impressions are being formed by the projections *a*, substantially as and for the purposes specified.

4. The combination of the dies A A′, each provided with a circular projection, *a*, for forming the impressions at the sides of a spring-eye, and devices, substantially as herein set forth, for entering the hole of the eye and retaining the latter in shape while the said impressions are being formed, substantially as and for the purposes specified.

WILLIAM HARTY.

Attest:
T. C. ANDERSON,
J. W. BANNON.