

(No Model.)

2 Sheets—Sheet 1.

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MACHINE FOR FORMING AND SECURING THE EYES ON UMBRELLA RIBS.

No. 509,682.

Patented Nov. 28, 1893.

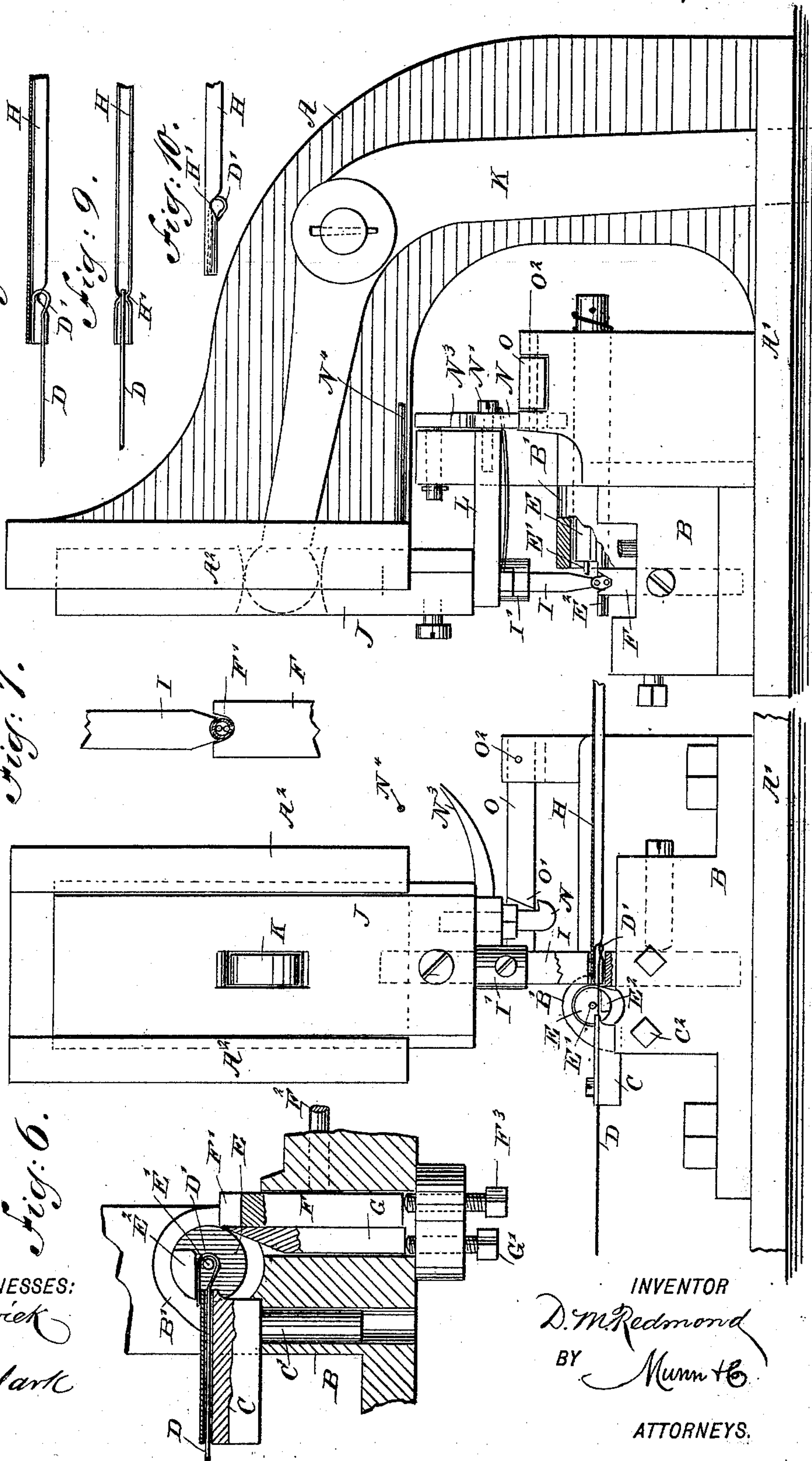
Fig. 1.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

DANIEL M. REDMOND, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR FORMING AND SECURING THE EYES ON UMBRELLA-RIBS.

SPECIFICATION forming part of Letters Patent No. 509,682, dated November 28, 1893.

Application filed February 6, 1893. Serial No. 461,189. (No model.)

To all whom it may concern:

Be it known that I, DANIEL M. REDMOND, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Machine for Forming and Securing the Eyes on Umbrella-Ribs, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved machine for conveniently and rapidly forming the eyes for umbrella ribs and at the same time securing the eyes in place on the ribs.

The invention consists of a revoluble die for bending wire to form the eye, and a reciprocating punch for pressing the rib end with the eye placed therein, to secure the eye to the rib.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the improvement with parts in section. Fig. 2 is a side elevation of the same with parts in section. Fig. 3 is an enlarged plan view of the lower part of the machine. Fig. 4 is a rear face view of the lower part of the machine, and with parts in section. Fig. 5 is a rear side elevation of the same with parts in section. Fig. 6 is an enlarged sectional side elevation of the mechanism for forming the eye on the wire. Fig. 7 is a side elevation of the dies for pressing the eye in place on the rib. Fig. 8 is a longitudinal section of the rib with the eye placed therein. Fig. 9 is an inverted plan view of the same; and Fig. 10 is a side elevation of the finished article.

The improved machine is provided with a suitably-constructed frame A, formed with a base A' on which is secured the block B, supporting on its top the wire guide C, through which passes the wire D, on which the eye D' is formed, the said guide C being provided with a shank C', fitted to slide vertically in a suitable bearing in the block B, see Fig. 6, and adapted to be secured in place in the block by a set screw C², so that the wire guide

is at the proper height relative to the die E, which forms the eye D'. This die E is mounted to revolve in a transversely-extending bearing B', formed on top of the block B and on the front face of this revoluble die E, projects centrally a pin E', between which and an angular offset E², projecting from the face of the die, passes the wire D, as plainly shown in Fig. 1. The offset E² is then in a lowermost position and when the wire eye passes a suitable distance above the top surface of the offset under the pin E', and the die E is then turned, then the wire is bent by the offset E² around the central pin E' to form the eye D' on the end of the wire D, as will be readily understood by reference to Fig. 6.

On the side of the offset E² opposite the wire feed guide C, is arranged a female die F, formed at its upper end with a V-shaped notch F', closed at its inner end by the wedge-shaped end of a gage plate G, placed to the left of the female die F, and fitted with the latter in a recess in the block B, as shown in detail in Fig. 6. The die F and the gage-plate G are adapted to be secured in place in the block by a set screw F², and the said die and gage-plate are adapted to be adjusted vertically by set screws F³ and G', respectively, screwing in the block B against the under side of the said die F and gage-plate G.

After the eye D' has been formed by the die E, as above described, then the latter revolves in an opposite direction, so as to assume its former position, shown in Fig. 1, whereby the eye D' is free to be moved rearwardly into the V-shaped notch F' of the female die, to be then engaged by the end of the umbrella rib H, which end is made U-shaped in cross section and has part of its sides pressed inwardly to form a catch for the hook D'. See Figs. 8, 9 and 10. This umbrella rib H is passed over the eye D' so that the latter presents part of its eye through the inwardly pressed sides H' of the umbrella rib, and then when the eye and rib are in place a male die I, moves downward to press the sides of the rib H close together to securely lock the shank of the eye in place. See Fig. 10. This die I is secured in a socket I' held adjustably in a cross head J, mounted to slide vertically in suitable bearings A², formed on the upper part of the main frame A. The

cross head J is engaged by one end of a lever K, operated by a treadle or other mechanism, so as to reciprocate the said cross head J and the die I, for the purpose of pressing the rib H onto the shank of the eye D', as above described.

In order to turn the die E and slide the same transversely, in conjunction with the reciprocating movement of the cross head J, the following device is provided: On the under side of the cross head J is secured a transversely-extending arm L, on the rear end of which is pivoted at N' a hook N, pressed on by a spring N², secured to the arm L. The hook N is adapted to engage a bevel shoulder O' projecting from an arm O, pivoted at O² to the block B; see Figs. 1, 2, 3, 4 and 5, the said pivoted arm O being connected at its free end by a clamp O³, or other means with one end of a band P, made of leather or other suitable material. The band P passes around the rear end of the cylindrical die E and is fastened to the same by clamps or other devices so that when the arm O swings upward, the said band P draws on the die E and rotates the same in its bearing B' for the purpose of forming the eye D', as previously described.

A spring E³, is fastened at one end on the extreme rear end of the die E and is coiled on the same, and the other end is fastened to the block B, whereby on rotating the die E by the band P, as previously mentioned, the said spring E³ is wound up or compressed, so that whenever the hook N disengages the said pivoted arm O then the spring E³ rotates the die E in an opposite direction and returns the same to its normal position, shown in Fig. 1, to permit of moving the eye D' of the wire D into the notch F' of the female die F for the purpose of fastening the eye in place on the rib, as before described. The spring E³ also serves to impart an outward sliding motion to the die E, to bring the pin E' into the proper position over the wire D previous to the formation of the eye D'. In order to impart a like sliding motion to the die E so as to move the pin E' out of the eye D' after the latter is formed, I provide the rear end of the said die with a beveled cam E⁴, adapted to engage a beveled edge Q', formed on the lower end of an arm Q, pivoted at Q² to the block B. A spring R, presses on the pivoted arm Q to hold the latter in proper position for engagement by the cam E⁴. The forward end of the arm Q is formed with a beveled offset Q³, adapted to be engaged by the pin L' of arm L of the cross-head J when the latter moves downward so as to swing the arm Q and hold the beveled edge Q' out of the path of the cam E⁴ to permit the spring E³ to force the die E outward and bring the pin E' into proper position for the passage of the wire D for forming the eye D' thereon, as hereinbefore described.

In order to limit the downward swinging motion of the arm O, I provide a yielding

mounted pin S, arranged to form a seat for the said arm O as the latter swings downward after the hook N has released the arm and the spring E³ rotates the die E, as previously described. The pin S is for this purpose set on a spring S', arranged in a socket S², formed or secured on the block B, as plainly illustrated in Fig. 4. Now, it will be seen that when the cross head J moves downward, the hook N engages the beveled edge O' of the pivoted arm O, so that when the cross head moves upward, the arm O is swung upward to turn the die E for the purpose of forming the eye D' on the end of the wire D, as previously described, and when the cross head J arrives near its uppermost position, the arm N³ on the hook N engages a fixed pin N⁴, projecting from the frame A, to trip the said hook to disengage it from the beveled shoulder O' on the arm O, so that the latter is free to swing downward, the spring E³ then returning the die E and winding up the band P, as before mentioned. At the same time, a lateral sliding motion is given to the die E by the cam E⁴ engaging the beveled edge Q' of the arm Q, to remove the central pin E' from the eye D', so that the latter is free to be fed forward under the dies F and I, which on the next downward movement of the cross head J securely fasten the eye in place on the rib, the latter having been hooked over the said eye previous to the downward movement of the die I.

It is understood that one sharp edge of the projection E² serves to partly cut the shank for the eye, so that the latter is readily detached from the wire by a slight pull on the wire after the eye is secured in place on the rib.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A machine of the class described, comprising a revoluble die for bending the wire to form the eye, a stationary female die, and a reciprocating male die or punch for pressing the rib end onto the eye shank to fasten the eye in place, substantially as shown and described.

2. A machine of the class described, comprising a revoluble die for bending the wire to form the eye, a stationary female die, a reciprocating male die or punch for pressing the rib end onto the eye shank to fasten the eye in place, and means, substantially as described, for rotating the said die from the reciprocating cross head carrying the reciprocating die, substantially as shown and described.

3. The combination with the frame provided with a guide for the wire and a bearing at right angles thereto, of a rotary reciprocating shaft journaled in said bearing and having a circular head provided with a central and an eccentric projection the space between said two projections being adapted to align with the guide to receive the wire therefrom and

the said guide extending into the path of the eccentric projection and upon which the free end of the wire is bent thereby, and means for automatically retracting and projecting the said die shaft with its head and projections, substantially as set forth.

4. The combination with the frame the wire guide and the two dies in front thereof, of a rotary reciprocating bending die between the guide and said two dies and provided with two projections on its face to bend the wire upon itself for action by said two dies; said rotary die being retracted after thus bending the wire, substantially as set forth.

5. A machine of the class described, comprising a revoluble die having a projection, and a central pin for forming the eye on the wire, a female die having a V-shaped recess and located in the rear of the said die, a reciprocating male die moving toward and from the said female die to press the rib end to secure the die in place therein, and means, substantially as described, for operating the said reciprocating die and the said revoluble die in unison with each other, substantially as shown and described.

6. In a machine of the class described, the combination with a revoluble die, and a reciprocating cross head, of a hook pivoted on the said cross head, a pivoted arm adapted to be engaged by the said hook, and a band connected with the said pivoted arm and with

the said revoluble die to rotate the latter in one direction, substantially as shown and described.

7. In a machine of the class described, the combination with a revoluble die, and a reciprocating cross head, of a hook pivoted on the said cross head, a pivoted arm adapted to be engaged by the said hook, a band connected with the said pivoted arm and with the said revoluble die to rotate the latter in one direction, and a spring coiled on the said revoluble die and adapted to turn the same in an opposite direction to that given the die by the said band, as shown and described.

8. In a machine of the class described, the combination with a revoluble die, and a reciprocating cross head, of a hook pivoted on the said cross head, a pivoted arm adapted to be engaged by the said hook, a band connected with the said pivoted arm and with the said revoluble die to rotate the latter in one direction, a spring coiled on the said revoluble die and adapted to turn the same in an opposite direction to that given the die by the said band, and means, substantially as described, for imparting a lateral sliding motion to the said revoluble die, as set forth.

DANIEL M. REDMOND.

Witnesses:

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E. M. CLARK.