

No. 630,874.

Patented Aug. 15, 1899.

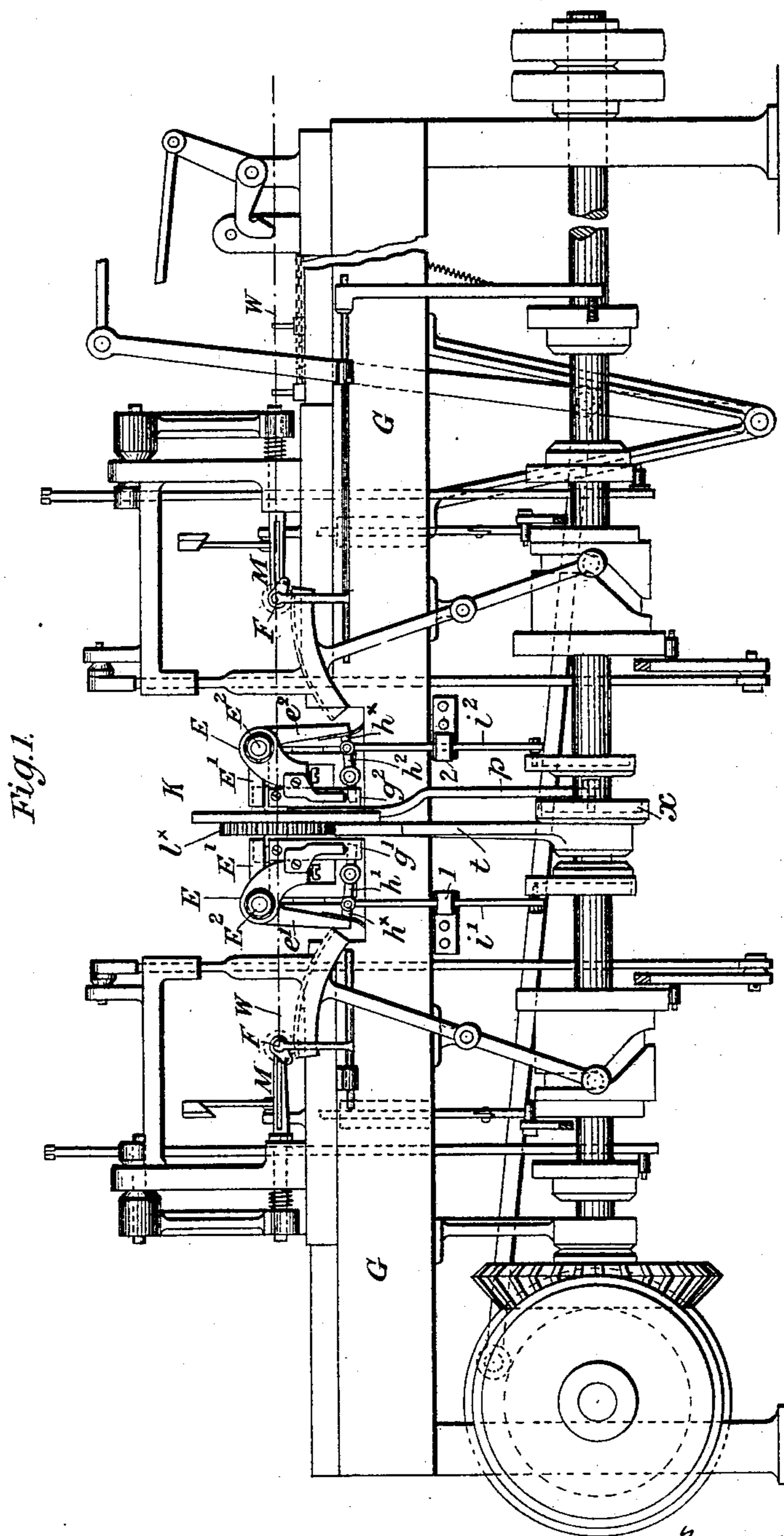
M. A. FICKER.

MACHINE FOR MAKING MIDDLE EYES OF HEDDLES.

(Application filed Aug. 11, 1896.)

(No Model.)

4 Sheets—Sheet 1.



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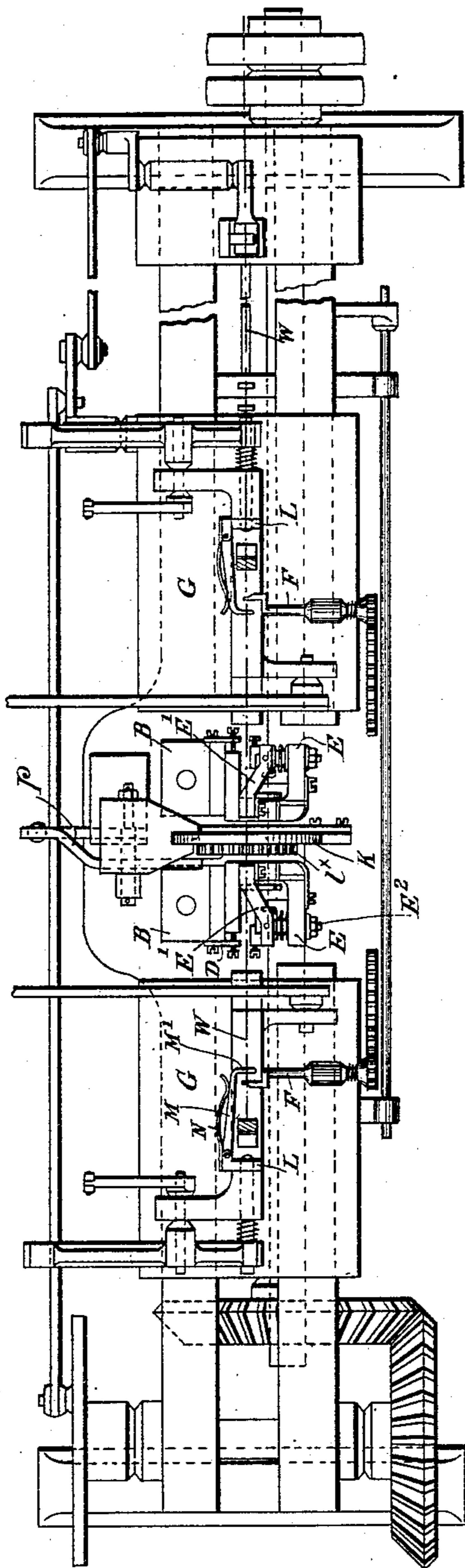
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Fig. 2.



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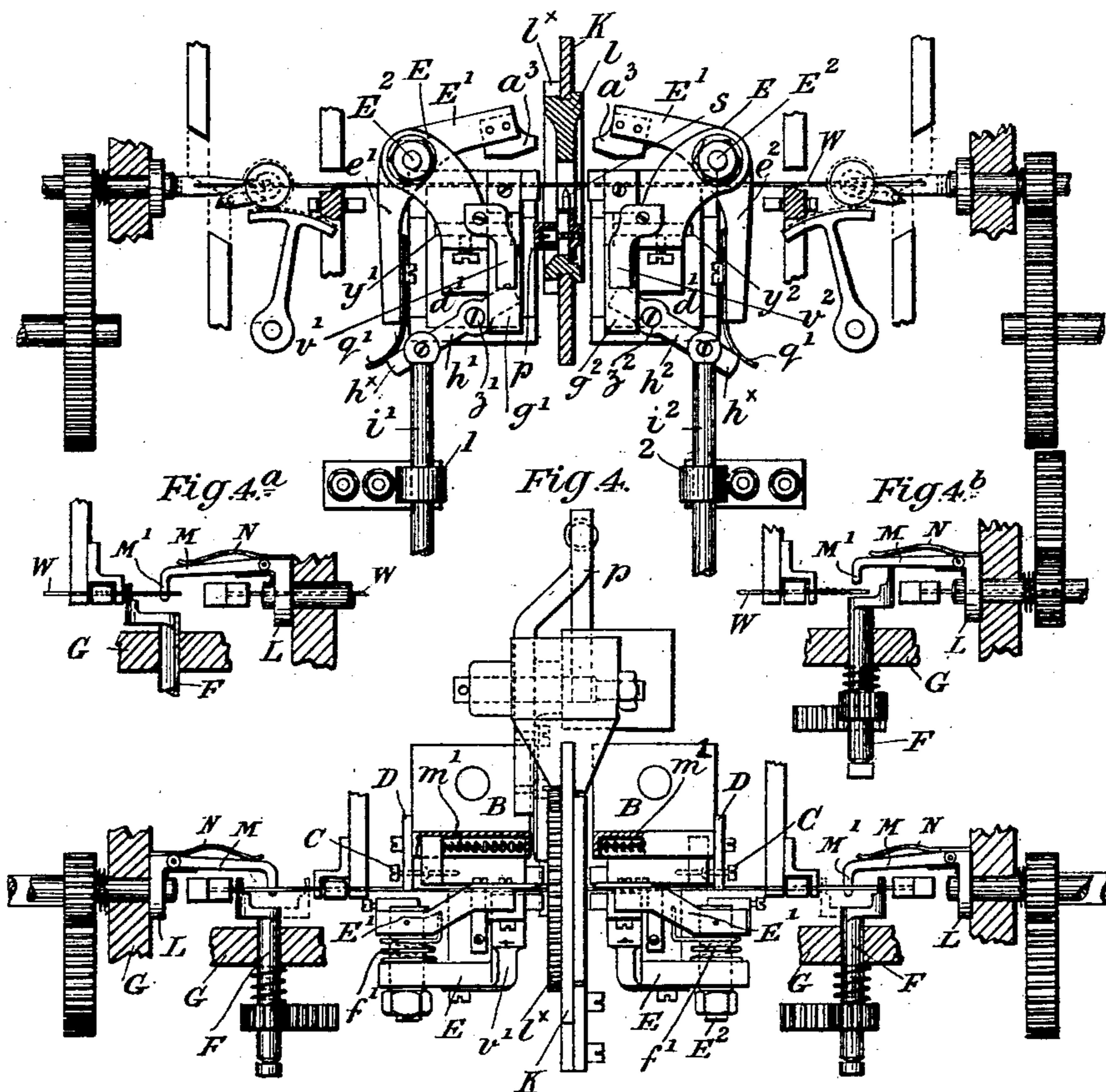
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Fig. 3.



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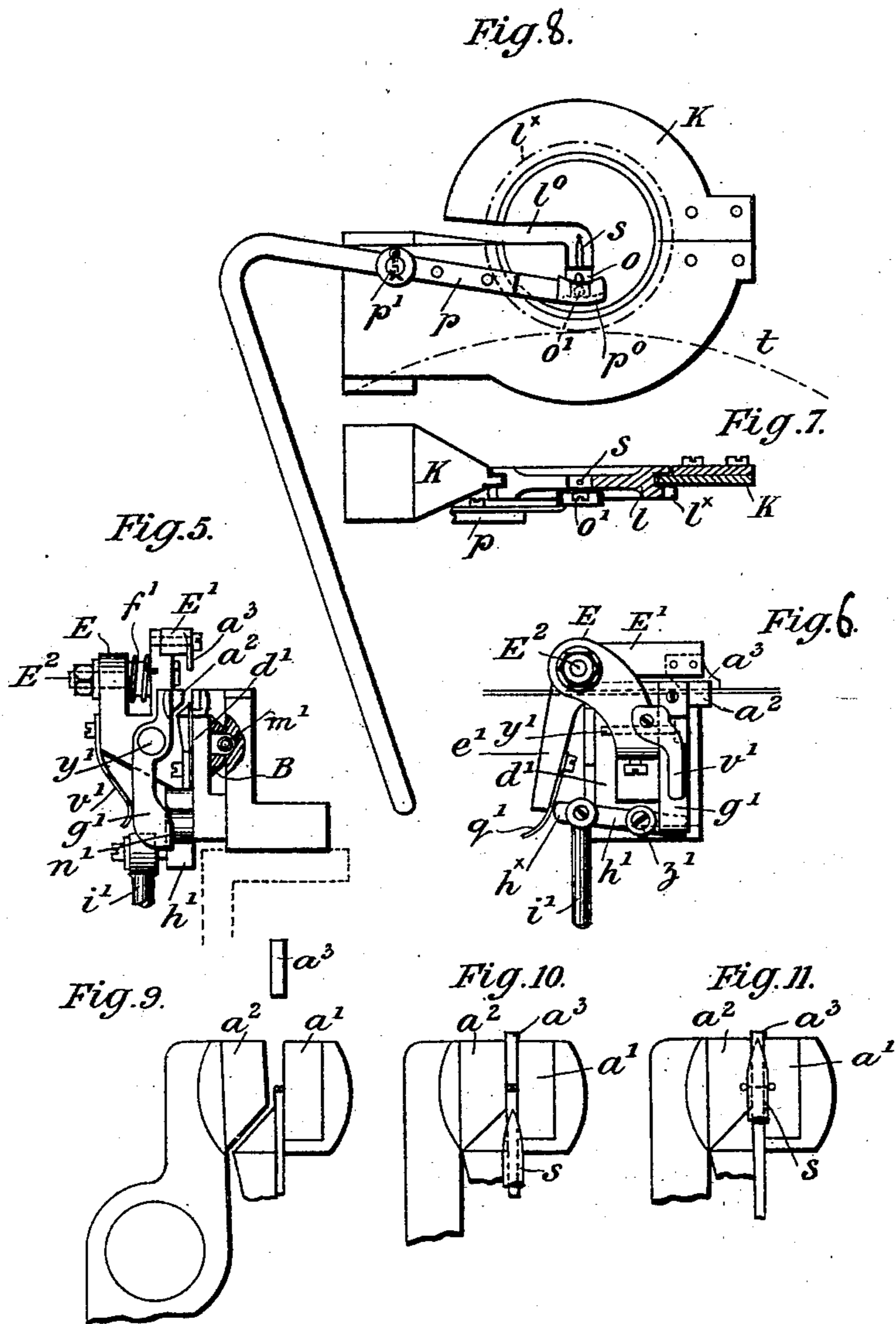
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

MAX ALFRED FICKER, OF CHEMNITZ, GERMANY, ASSIGNOR TO FELTEN & GUILLEAUME, OF MÜLHEIM-ON-THE-RHINE, GERMANY.

MACHINE FOR MAKING MIDDLE EYES OF HEDDLES.

SPECIFICATION forming part of Letters Patent No. 630,874, dated August 15, 1899.

Application filed August 11, 1896. Serial No. 602,404. (No model.)

To all whom it may concern:

Be it known that I, MAX ALFRED FICKER, a subject of the King of Saxony, residing at Chemnitz, Saxony, Germany, have invented
5 certain new and useful Improvements in Machines for Making Middle Eyes of Heddles, (in respect whereof I have obtained Letters Patent in Germany, No. 91,016, dated March 21, 1895, and in Great Britain, No. 7,651, dated
10 April 16, 1895,) of which the following is a specification.

This invention relates to the production of the middle eyes of heddles composed of two wires soldered together; and it consists in improved means for holding and adjusting the
15 said wires during the splitting and twisting operations, whereby the formation of the said eyes is effected in a more certain and uniform manner.

20 In the accompanying drawings, Figure 1 represents in side elevation a heddle-forming machine embodying the present improvements. Fig. 2 is a corresponding plan. Figs. 3 and 4 are enlarged views in elevation and
25 plan, respectively, of the mechanism employed in forming the middle eye, the same being shown in connection with the apparatus for making the end loops. Figs. 4^a and 4^b are views in plan of the mechanism employed
30 in making the end loops, the former showing the position of the parts immediately after the end of double wire has been turned back to form the loop and the latter the position of the parts when the operation of twisting
35 has been accomplished and the wire is free for being removed from the machine. Fig. 5 is a side view showing the means for holding or clipping the wire, being viewed from the right in Fig. 1. Fig. 6 is a face view of
40 the means for holding or clipping the wire, the parts being shown in compression on the wire. Figs. 7 and 8 represent in side view and horizontal section, respectively, the device for splitting and twisting the wire to form
45 the middle eye. Figs. 9, 10, and 11 illustrate various positions of the holding or clipping mechanism during the manipulation of the wire.

50 The apparatus is mounted upon a suitable frame G. Upon each side of the vertical center line of this frame are secured the guides

1 and 2, through which the reciprocating draft-bars i' i^2 work, suitable means being provided at their lower ends, as will be readily understood, for operating said bars. The bars are
55 respectively connected at their upper ends with two-armed levers h' h^2 , whereby the levers e' e^2 g' g^2 , pertaining to the mechanism for holding the wires, are operated.

The wire is held on each side of the eye by 60 means of a three-part clip or holder, the same being arranged and operated as hereinafter described. Each clip is a counterpart of the other, so that a description of the parts of the one is applicable to the other. On the
65 frame G is secured an L-shaped bracket B, whereof the upright portion is formed with a correspondingly-extending dovetail projection, on which a correspondingly-formed sliding plate d' works, the latter being main-
70 tained in position by the screw or pin C in the arm D and being automatically adjustable along the dovetail slide by means of the coil-spring m' , arranged in a horizontal recess in the upright portion of the bracket B. This
75 spring, while serving to effect the lateral movement of the sliding plate, maintains a tension on the wire. On the face of the plate d' is secured a carrier E, whereof the outer end is provided with a shaft having mounted
80 therein in any suitable manner another shaft E^2 . Mounted on said shaft is a coil-spring f' , whereof one end is secured to the carrier, while the other end is extended a certain distance toward the center of the machine and
85 is then bent at right angles. This bent portion extends toward the rear of the machine and engages with and operates the bell-crank lever E' , the depending end e' of the said lever being provided with a curved plate or
90 spring q' . To the outer extremity of the horizontally-extending arm of the bell-crank lever E' is secured the part a^3 , pertaining to the clip or holder for the wire. The part a^3 of the clip or holder is carried at the upper extremity
95 of the lever g' or g^2 , as the case may be. Each of the said levers is mounted on a fulcrum-pin y' or y^2 and is furnished at its lower extremity with an incline n' or n^2 , a spring v' or v^2 , by pressing against the lower extremity,
100 preserving the severance of the parts a' and a^2 of the holder.

The two-armed levers h' h^2 are each connected to the upper end of its respective draft-bar i' or i^2 and pivotally mounted on a pin z' or z^2 , carried by the plate d' , the outer extremity h^x working against the curved plate or spring q' , while the inner extremity works against the inclined portion n' or n^2 of the lever g' or g^2 . Between the holding devices is placed the splitting and twisting mechanism, the same comprising a stationary casing K, in which is mounted a disk l , provided with an L-shaped or right-angled opening l^0 , in the central portion of which is a reciprocating splitting-pin s . This pin is carried in a sliding block o , which is connected with the extremity p^0 of the lever p by means of a pin o' . The lever p is fulcrumed at p' and is vibrated by means of a cam x on the main shaft, Fig. 1, the cam being so formed as to cause the lever p to dwell during the rotation of the disk l , and thereby maintain the pin s in its raised position during the formation of the eye. The disk l is provided with teeth l^x , which form a circular rack for engaging with the teeth of the quadrant t , mounted on the main shaft of the machine.

The mechanism for forming the end loops, Fig. 4^a, and for feeding the wire, Fig. 4^b, are situated on either side of the middle-eye forming mechanism.

F is a shaft having a cranked extremity.

M is an arm hinged to the plate L, secured to the frame G, a lug M' being provided at the outer end of said arm M.

N is a spring secured to the plate L and adapted to bear against the arm M. The wire W is passed through an opening provided in the plate L.

The operation of the improved mechanism in forming a middle eye is as follows: The requisite length of double soldered wire having been fed into the machine the wire is held in the inner portion of the angular opening l^0 of the wheel l by means of the three-part clips or holders, Figs. 9, 10, and 11, the wire being thereby maintained in a horizontal or flat position. The splitting-pin s is then operated, the pin rising and entering between the wires, whereupon the wheel l , through the medium of the quadrant t , is rotated, with the result that the necessary twists are made at each end of the eye. The slight shortening of the length of the heddle incidental to the twisting operation is compensated for by the springs m' m^2 , pertaining to the clips or holders.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The herein-described means for forming the middle eye in soldered double-wire heddles, the same comprising a pair of three-part clips or clamps for holding the wire in a flat position; a splitting and twisting device consisting of a casing fitted with a rotating body adapted to receive the wire and furnished with a reciprocating splitting-pin, and means for operating the several parts, substantially as described.

2. In a heddle-forming machine, the combination, with the draft-bars, i' , i^2 , of the two-armed levers, h' , h^2 , levers, g' , g^2 , and e' , e^2 , holders or clamps, a' , a^2 , a^3 , sliding plates, d' , and brackets, B; the levers, g' , g^2 , being operated by the inner end of the levers, h' , h^2 , while the levers, e' , e^2 , are operated by the outer end of the said levers, h' , h^2 , substantially as herein set forth.

3. For forming the middle eye of soldered double-wire heddles, a frame having draft-bars mounted in guides thereon, two-armed levers h' , h^2 pivotally mounted at the upper end of said draft-bars, and fulcrumed in sliding plates carried on brackets secured to said frame, two-armed levers e' , e^2 , g' , g^2 mounted on said plates, springs adapted to engage each of said levers, each of which carries a part of the clamping or holding device while the plate carries the other part; a casing being mounted between the clamps and fitted with a toothed wheel provided with an angular opening, a lever pivotally mounted on the casing and having at its inner end a pin adapted to form said eye, all constructed and operating substantially as described.

4. For forming the middle eye of soldered double-wire heddles, a frame having guides secured thereon, draft-bars working in said guides, double-armed levers secured to the upper end of said draft-bars, plates having clamps fastened at their upper extremities, carriers secured to said plates and having levers fastened thereon, steel dies on said levers and springs adapted to engage said levers, and a holding-casing having mounted therein a toothed wheel, a lever pivotally mounted on said casing and connected at its inner end with a slide fitted with a pin, the slide and pin being revoluble with said toothed wheel, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MAX ALFRED FICKER.

Witnesses:

ALFRED OTTO THEUERKORN,
MAX GEORG THEUERKORN.