

(No Model.)

E. ESBRAYAT.
MACHINE FOR MAKING WIRE HEDDLES.

No. 403,879.

Patented May 21 1889.

Fig. 1.

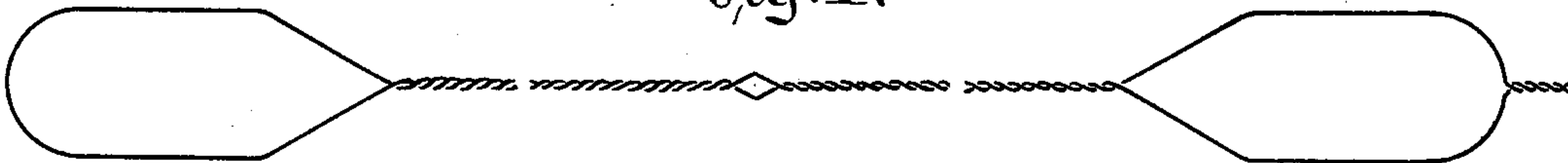


Fig. 2.

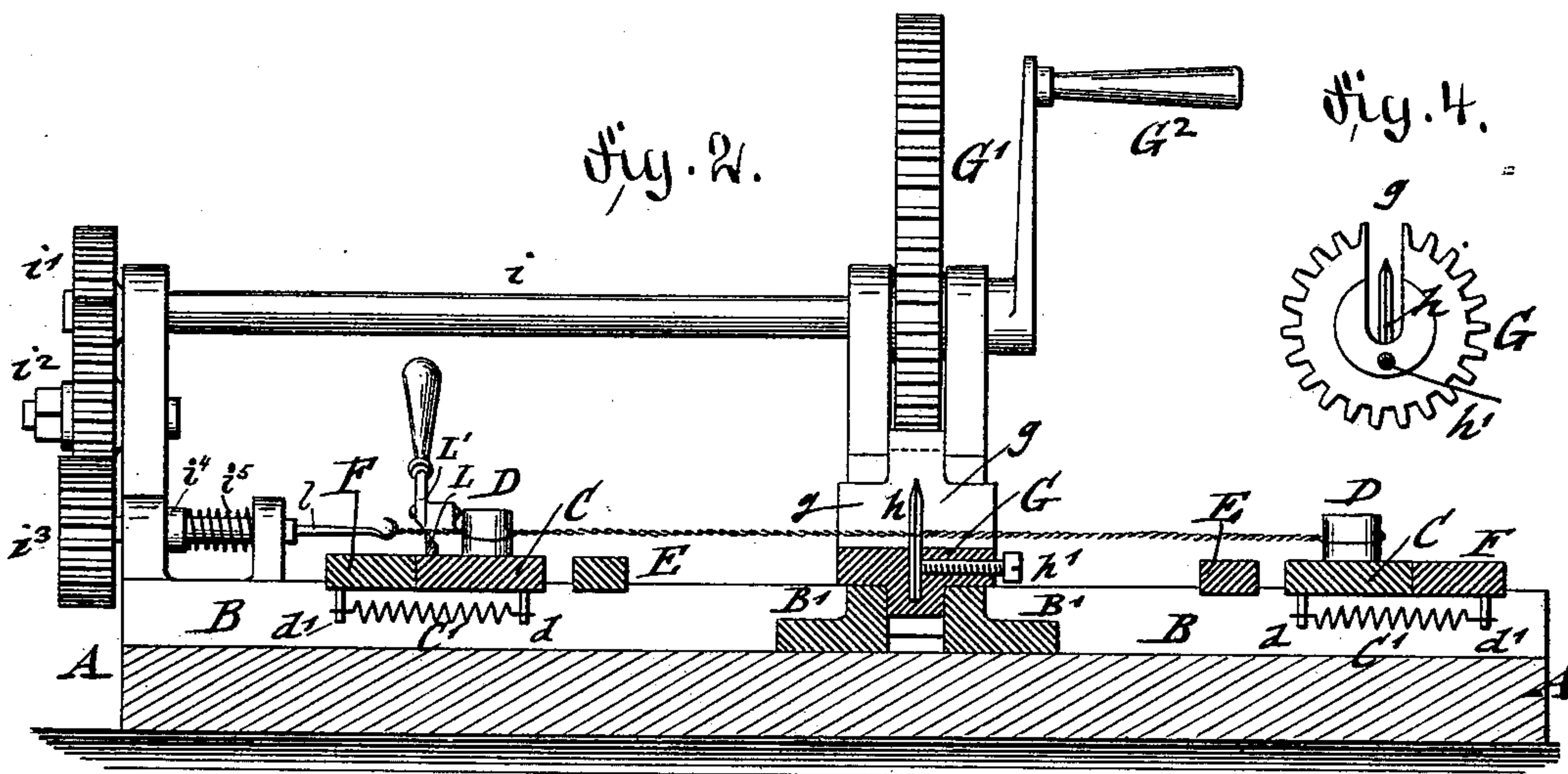


Fig. 4.

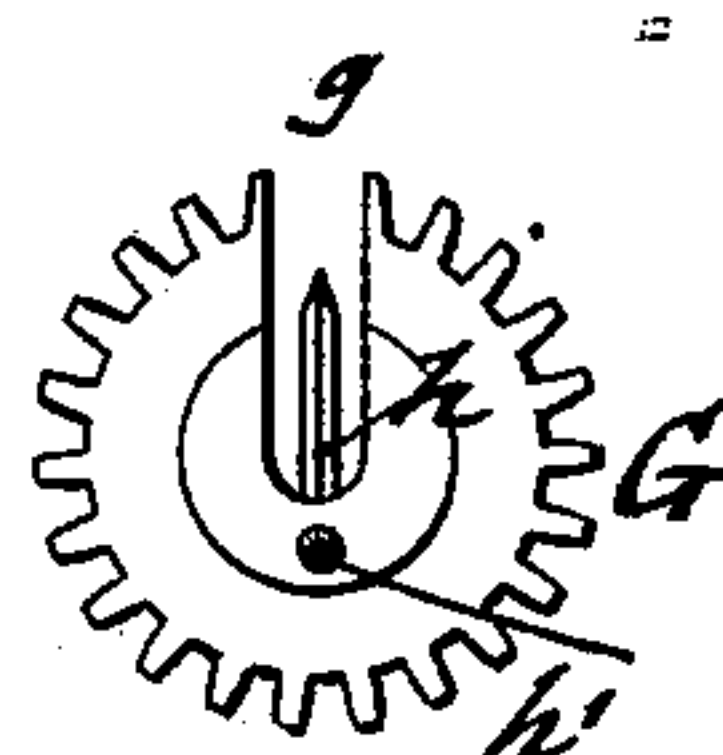


Fig. 3.

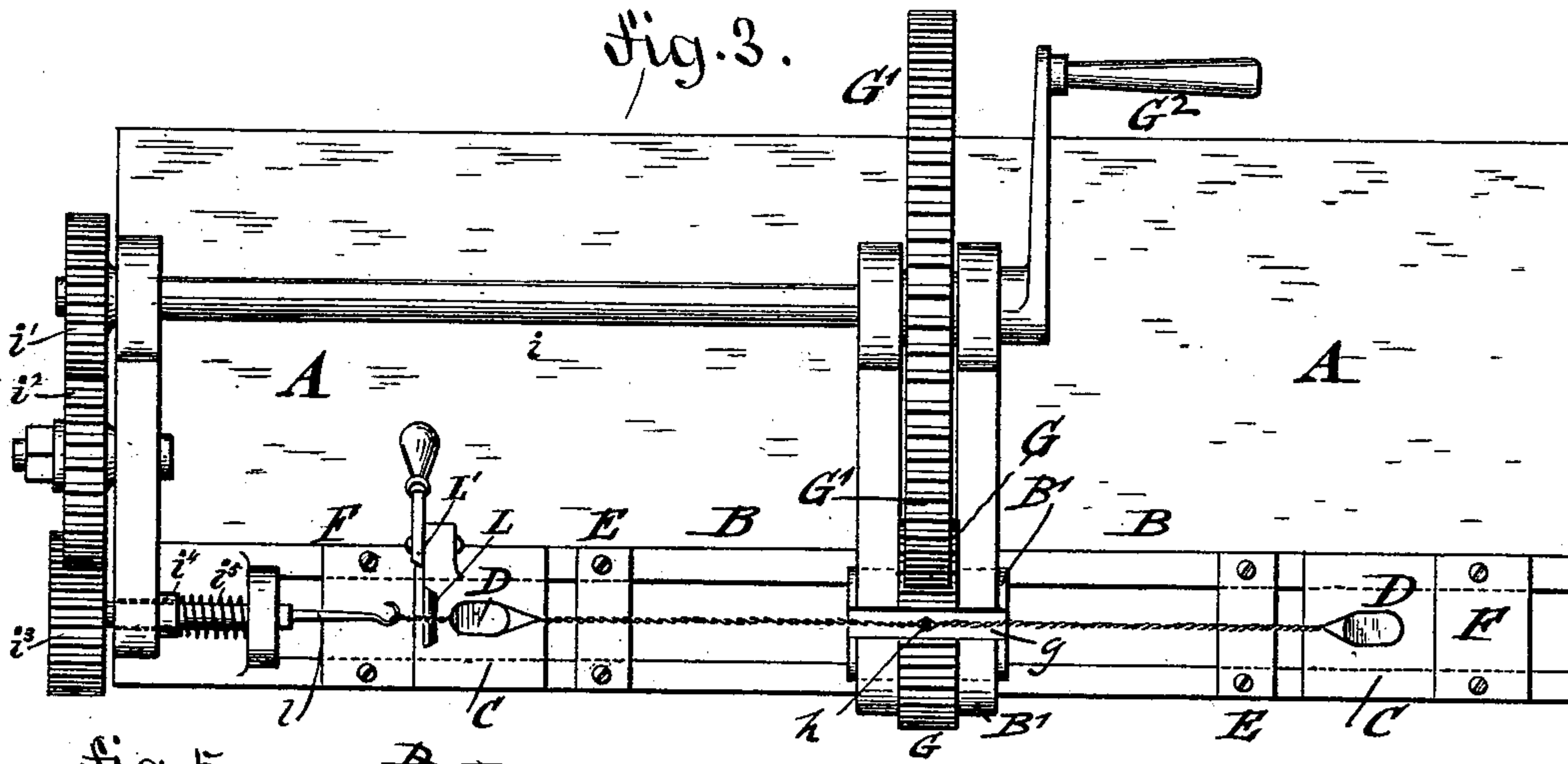


Fig. 5.



Fig. 6.



WITNESSES:

F. W. Rosenbaum.
Carl Kemp

INVENTOR

Emmanuel Esbrayat
BY
J. P. Reger
ATTORNEYS

UNITED STATES PATENT OFFICE.

EMMANUEL ESBRAYAT, OF LYONS, FRANCE.

MACHINE FOR MAKING WIRE HEDDLES.

SPECIFICATION forming part of Letters Patent No. 403,879, dated May 21, 1889.

Application filed August 27, 1888. Serial No. 283,824. (No model.) Patented in France May 3, 1888, No. 190,347.

To all whom it may concern:

Be it known that I, EMMANUEL ESBRAYAT, of Lyons, in the Republic of France, have invented certain new and useful Improvements in Machines for Making Wire Heddles, (which have been patented to me in France, No. 190,347, under date of May 3, 1888,) of which the following is a specification.

This invention relates to an improved machine for making wire heddles of that class in which the warp-eye is made integral with the shank of the heddle and connected by twisted shanks with the heddle-bar eyes at the ends, said machine being adapted for producing said heddles in a quick and uniform manner; and the invention consists of a machine for making wire heddles, in which the wire blank is stretched on studs or posts of guided and spring-actuated slide-plates, and in which the twisted shanks are produced by a fixed spindle secured into a longitudinally-recessed rotary pinion located in line with the posts. Near one of the stretching studs or posts is arranged a rotary and spring-cushioned spindle having a hook-shaped inner end for taking hold of and twisting the ends of the wire blank, and a cutting device for cutting off said twisted ends to uniform length.

In the accompanying drawings, Figure 1 represents a side view of a wire heddle of the usual well-known construction, which is to be made by my improved machine. Fig. 2 is a vertical longitudinal section of my improved machine for making wire heddles; Fig. 3, a plan view of the same; Fig. 4, a detail end view of the rotary pinion and the spindle for forming the warp-eye; and Figs. 5 and 6 are details showing the stretching of a single or double wire blank on the posts preparatory to twisting the blank.

Similar letters of reference indicate corresponding parts.

The machine consists of a bed-frame, A, on which are arranged longitudinal ways B, on which are guided slide-plates C C, to each of which is applied a vertical stud or post, D, having rounded-off edges, which studs serve for forming the heddle-bar eyes of the heddle. The slide-plates C C are movable on the ways B B between fixed abutments E and F, which control the extent of motion of the slide-plates

C C when the wire blank of the heddle is being twisted. The slide-plates C C are connected by spiral springs C' C', attached to pins *d d'* at the under side of the slide-plates C and of the outer abutments F F, so as to be moved toward said abutments when no tension is exerted on the studs or posts D D. Midway between the slide-plates C C the ways B B are recessed transversely and provided with a fixed ring-shaped bearing, B', that supports the journals of a pinion, G, so that the latter can rotate in said bearings.

The pinion G and its ring-shaped bearing B' are provided with a radial recess, *g*, that extends from the circumference toward and slightly beyond the center of the pinion, the pinion being provided in said recess with a fixed and pointed spindle, N, which is retained in the pinion by a set-screw, *h'*, as shown in Fig. 2, said spindle being of rhombic or other cross-section and serving to form the warp-eye of the heddle. The pinion G is rotated by a cog-wheel, G', of larger diameter, the shaft *i* of which is rotated by a crank-handle, G², rotary motion being also transmitted from said shaft by intermediate gearings, *i' i² i³*, to a spindle, *l*, which spindle is supported in line with the studs or posts D D and the spindle of the pinion G. To the spindle *l* is applied a fixed collar, *i⁴*, between which and the supporting-standard of the spindle is interposed a spiral spring, *i⁵*, that serves to cushion the spindle against the tension exerted on the same by the wire blank in forming the heddle. The gear-wheel *i³* is made wide enough to provide for the motion of the spindle without getting out of mesh with the gear-wheel *i²*. The end of the spindle *l* is made hook-shaped and serves to engage the ends of the wire blank from which the heddle is formed, as shown in Figs. 5 and 6, so as to twist said ends together simultaneously with the twisting of the shanks of the heddle by the operation of the machine. Near the end of the spindle and transversely thereto is arranged a fixed cutter, L, and a pivoted cutting-knife, L', which serve to cut off or trim the twisted end of the wire heddle when the twisting of the same is accomplished, the cutting device L L' being clearly shown in Figs. 2 and 3.

The machine is operated as follows: Wire blanks of the length required for making a

heddle are first cut and then doubled up and placed in position around the posts D D and on the hooked end of the spindle *l*, as shown in Figs. 5 and 6. The recess of the pinion G is then placed in line with the studs D D, so that the wire blank can be introduced in the recess at both sides of the spindle *h*. The ends of the wire blank are then placed over the hook of the spindle *l*, after which the machine is set in motion by turning the hand-crank G². This produces the turning of the pinion G and its spindle *h*, and produces the twisting of the wire blank between the spindle and the studs D D, forming thereby the warp-eye on the spindle, the twisted shanks, and the shaped heddle-bareyes. During the twisting motion of the wire the slide-plates C C are slowly moved forward until they are stopped by the inner abutments, E, after which the operation of the machine is interrupted. Simultaneously with the twisting of the shanks of the heddle at both sides of the warp-eye the ends of the wire blank are also twisted together by the rotating spindle *l*. This twisted end is then trimmed by the cutting device L L', after which the heddle is removed from the studs D and spindle *h*. The slide-plates C C, as well as the spindle *l*, are then returned by their springs to their normal position. The springs of the slide-plates C, as well as the springs of the spindle *l*, are both for the same purpose—namely, for compensating for the shortening of the wire blank during the twisting operation, while keeping the blank sufficiently tight for the purpose of producing the required twist. Sometimes double-wire heddles made of two blanks are desired to be produced, in which case the two wire blanks are placed on the studs D and on the spindle of the pinion G in the same manner as before described for one blank; but in this case a small disk-shaped washer, *h*², (shown in Fig. 6,) is used, which is placed over the spindle intermediately between the blanks, so as to separate the second blank from the first blank and prevent the inter-twisting of the wires at the warp-eye. On removing the heddle the washer is removed from the adjoining eyes of the heddle.

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

1. In a machine for making wire heddles,

the combination of spring-actuated slide-plates having vertical studs or posts, fixed abutments at both sides of said slide-plates, and a rotary pinion located intermediately between said slide-plates, said pinion being provided with a radial recess and a fixed spindle in said recess, substantially as set forth.

2. The combination of guided and spring-actuated slide-plates having vertical lugs or posts, fixed abutments at each side of said slide-plates, a rotary pinion located intermediately between said slide-plates, said pinion being provided with a radial recess and a fixed spindle in said recess, and a rotary and spring-actuated spindle having a hook-shaped end in line with said lugs and central spindle, substantially as set forth.

3. The combination of longitudinally-guided or spring-actuated slide-plates having studs or posts, fixed abutments on each side of said slide-plates, a rotary pinion supported in fixed bearings intermediately between said slide-plates, said pinion being provided with a radial recess, a fixed spindle in said recess, a rotary and spring-actuated spindle at one end of the machine and in line with the studs and central spindle, and a cutting device arranged transversely to the rotary end spindle for cutting off the twisted end of the heddle, substantially as set forth.

4. The combination of a supporting bed-plate having longitudinal guideways, spring-actuated slide-plates guided on said ways, fixed abutments at each side of said guideways, upright studs or posts on said plates, a rotary pinion supported midway between said slide-plates on fixed bearings of the ways, a rotary and spring-actuated spindle having a hook-shaped inner end located in line with the posts and central spindle, and a cutting device arranged transversely between the hook-shaped end of the rotary spindle and the stud next adjoining the same, substantially as set forth.

The foregoing specification of my improvement in machines for making wire heddles signed by me this 29th day of May, 1888.

EMMANUEL ESBRAYAT.

Witnesses:

JULES LÉPINETTE,
L. VANDENESSE.