

Hertle & Thompson

Heddle Machine.

N^o 79,905.

Patented July 14, 1868.

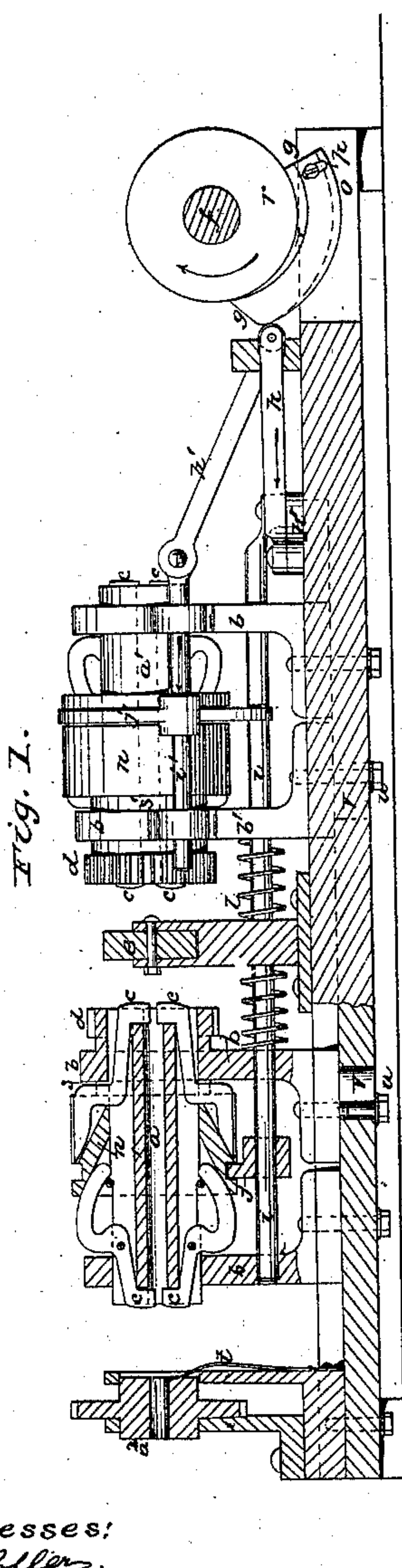


Fig. 1.

Fig. 3.

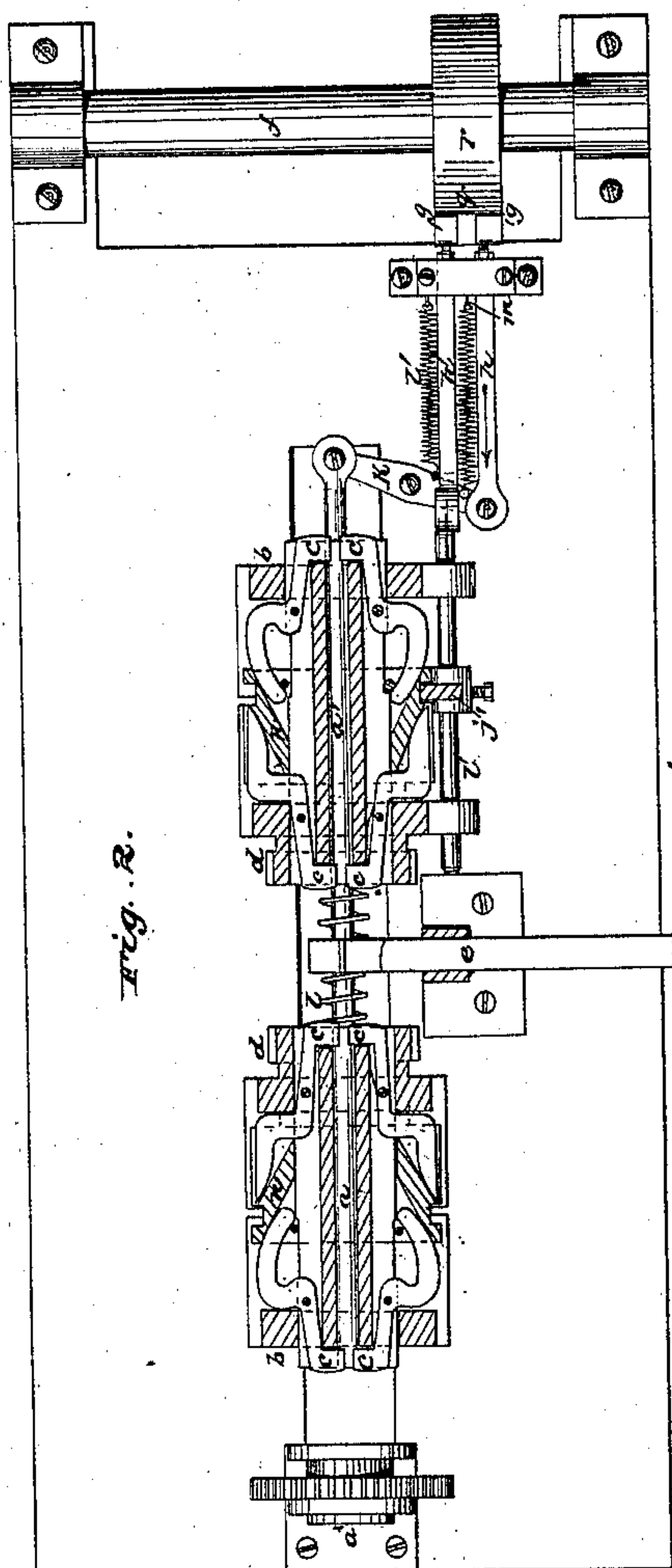


Fig. 2.

Fig. 4.

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UNITED STATES PATENT OFFICE.

EMIL T. HERTLE AND RICHARD THOMPSON, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINERY FOR MAKING WIRE HEDDLES.

Specification forming part of Letters Patent No. 79,905, dated July 14, 1868.

To all whom it may concern:

Be it known that we, EMIL T. HERTLE and RICHARD THOMPSON, of the city of New York, N. Y., have invented a new and useful Improvement in Machinery for Making Wire Heddles; and we do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which drawings—

Figure 1 is an elevation, partly in section, of a portion of a machine to which our improvement is applied. Fig. 2 is a plan view, the cylinders being shown in horizontal section. Fig. 3 represents an improved heddle made with the aid of our invention. Fig. 4 represents a heddle made on a machine to which our invention has not been applied.

This invention relates to an improvement of machinery for making wire heddles, and consists, in general terms, in causing the cylinders and jaws which grasp the heddle on each side of the pinchers that form the warp-eye to move toward the pinchers while the operation of twisting the wires and forming the eye is going on, so as to perform the operation of twisting without subjecting the wires to a longitudinal strain and make more perfect hoists in the heddle and a more perfect eye, and also to make the ends of the eye close and blunt, so that the warp-thread will not be liable to catch between the wires.

We have in this example shown our invention applied to an ordinary wire-heddle machine of the kind known as the "Finkle" machine; but we have shown only such parts of such machine as we have thought necessary to be represented in order to fully explain our invention.

The letters *a a'* designate the usual revolving hollow cylinders, which are placed on either side of the pinchers *C*, between whose jaws the central or warp eye of the wire heddle is formed. These cylinders *a a'* are supported in headstocks *b b'*, in which they are free to turn, their revolutions at the times required being accomplished by means of geared wheels *d d* on their inner ends, which are put in rotation by means of intermediate gear-wheels and shaft (not shown) that receive motion from the driving-

shaft *f*. Each cylinder has, as usual, two pairs of jaws, *c c*, one pair at each end, for the purpose of seizing and holding the wires that form the heddle during the operation of twisting the strands to form the eye. Said jaws are arranged to work in slots made in the cylinders lengthwise thereof, in which slots they are pivoted, as is shown in the drawings. The jaws are opened and closed automatically by the movements on the cylinders of the sliding collars *n n*, said collars being made with inclinations and pins, which operate upon the tail ends of the jaws, as is clearly represented in the drawings.

We do not claim the sliding collars *n*, their jaws *c*, nor their inclinations for operating the jaws, as these devices are in common use in wire-heddle machines; but our invention consists in moving the cylinders *a a'* toward each other while the twist is being given and the warp-eye formed.

The sliding collars *n n* are moved to and fro by a cam, *g g*, formed on a portion of the periphery of a disk placed on the driving-shaft *f*, which cam is so formed as to move the collars the required distance on the cylinders and hold them stationary while the twist is being given to the heddle, the said cam being so timed as to release them and open the jaws as soon as the twist is completed. The forward end of cam *g g* imparts motion to the collars *n n* by means of sliding bars *h h* and sliding rods *i i'*, said rods *i i'* being provided with forks *j j*, which enter grooves made around the collars, and impart to the latter the motion of the rods in the ordinary manner.

Each of the bars *h h'* is provided with anti-friction rollers at the ends, which come in contact with forward end of cam *g g*, and they are constantly forced toward the cam by springs *l'* and *m*. Rod *i'* and bar *h'* are directly connected to each other by a hinge-joint, as shown in the drawings, and the rod *i*, which acts in conjunction with cylinders *a*, which is the most distant from cam *g*, is connected to its bar *h* by a horizontal lever, *k*, of the first order. After the jaws *c* have been closed preparatory to the revolution of the cylinders *a a'*, we move said cylinders toward each other, for the more perfect twisting of the wires and the more perfect formation of the eye than has

hitherto been obtained, by the following construction and operation.

The cam *g g*, which is in two parts, each independent of the other, is made by pivoting the forward ends of the arc-shaped pieces *g g* to an arc-shaped rib, *q*, projecting from the periphery of the disk *r*, which rib *q* forms the foundation of the cam or cams. The rear ends of the cams *g g* are slotted, as at *p* in Fig. 1, to receive set-screws, which secure them to the foundation-rib *q* in any desired position of eccentricity to the center of the shaft *f*. The peripheries of the arc-shaped pieces *g g* form cams, from which the movements of the cylinders *a a'* toward each other are obtained. Said movements are communicated thereto through the action of said cams *g g* against the ends of the sliding arms *h h'* after the forward end of said cams *g g* has operated to move the sliding collar *n n* to the extent of the distance allowed to them toward the geared ends *d d* of said cylinders, said sliding collars being then arrested by coming up against circular shoulders *s s'*, formed in cylinders next to the head-stocks *b' b'*. These head-stocks *b' b'* are movable in grooved beds, being held therein by screws *u*, which go through slots *V* in the bottom of the bed, and they are moved toward each other by the action of the eccentric portions *o* of said cams *g g*, which give to the sliding rods *i i* a further forward movement in the directions indicated by the arrows, thereby pushing the collars *n n* against the shoulders *s s'* of the cylinders *a a'*, and causing the said cylinders and the movable head-stocks *b' b'*, which support their adjacent ends, to approach the pinchers *e*, in whose jaws that part of the heddle where the warp-eye is formed is grasped. The extent of this approach or movement of said cylinders and head-stocks toward each other is determined by the amount of eccentricity given to the cam-pieces *g g*, and the duration of the movement is determined by the length of the arc occupied by them. When their ends 2 have passed the bars *h h'* the springs *l' m* restore the bars to their former position near the disk *r* and draw the rods *i' i''* back in directions respectively opposite to the directions indicated by the arrows marked on said rods, whereby the sliding collars *n n* are also drawn back to their former positions on their respective cylinders, and the jaws *c c* are opened. At the same time the cylinders *a a'* and the movable head-stocks are moved back to their

original positions by the operation of the spring *l*, which is arranged on rod *i* between the movable head-stocks *b' b'* in such a manner that it becomes compressed by their movement toward each other; and when the collars *n n* cease to press against the shoulders *s s'* the tension of said spring *l* operates to push the said head-stocks back again to their former positions, taking with them the cylinders, with whose shoulders *s s'* the head-stocks are always in contact.

The wires that form the heddle are drawn into the machine through the left-hand spindle or cylinder, *a'*, at the receiving end of the machine, which spindle is so arranged in its head-stocks as to be allowed some play endwise, being restored to its original position by the force of a spring, *t*.

Our invention enables us to prevent the formation of acute angles or crevices at the ends to the warp-eye of the heddles, as is now common in wire heddles, and to form smooth and rounded outlines at the ends of said eye, so that in the operations of forming sheds in weaving the warp will not catch in the ends of the eye, nor be frayed and torn therein, as is now commonly the case when wire heddles of the ordinary construction are used.

It will be observed that by making the inner head-stocks, *b' b'*, and the cylinders or spindles *a a'* capable of motion toward each other, as hereinabove set forth, they are both allowed to yield to the strain produced on them to draw them together by reason of the shortening of the wires that compose the heddle in the process of twisting.

What we claim as new, and desire to secure by Letters Patent, is—

1. Arranging the head-stocks *b' b'*, which support the inner or adjacent ends of the cylinders *a a'*, in the manner described, and for the purpose set forth.

2. The combination of the movable cylinders *a a'*, the rods *i i'*, bars *h h'*, and cam-pieces *g g'*, substantially as described, and for the purpose set forth.

This specification signed by us this 20th day of March, 1868, in presence of two subscribing witnesses.

EMIL T. HERTLE.
RICHARD THOMPSON.

Witnesses:

W. HAUFF,
J. C. POLLER.