(No Model.)

W. DECKER.

MACHINE FOR CONVERTING WIRE INTO A CONTINUOUS ROW OF CLAMPS.

No. 403,923 Patented May 28, 1889.

Fig. 1.

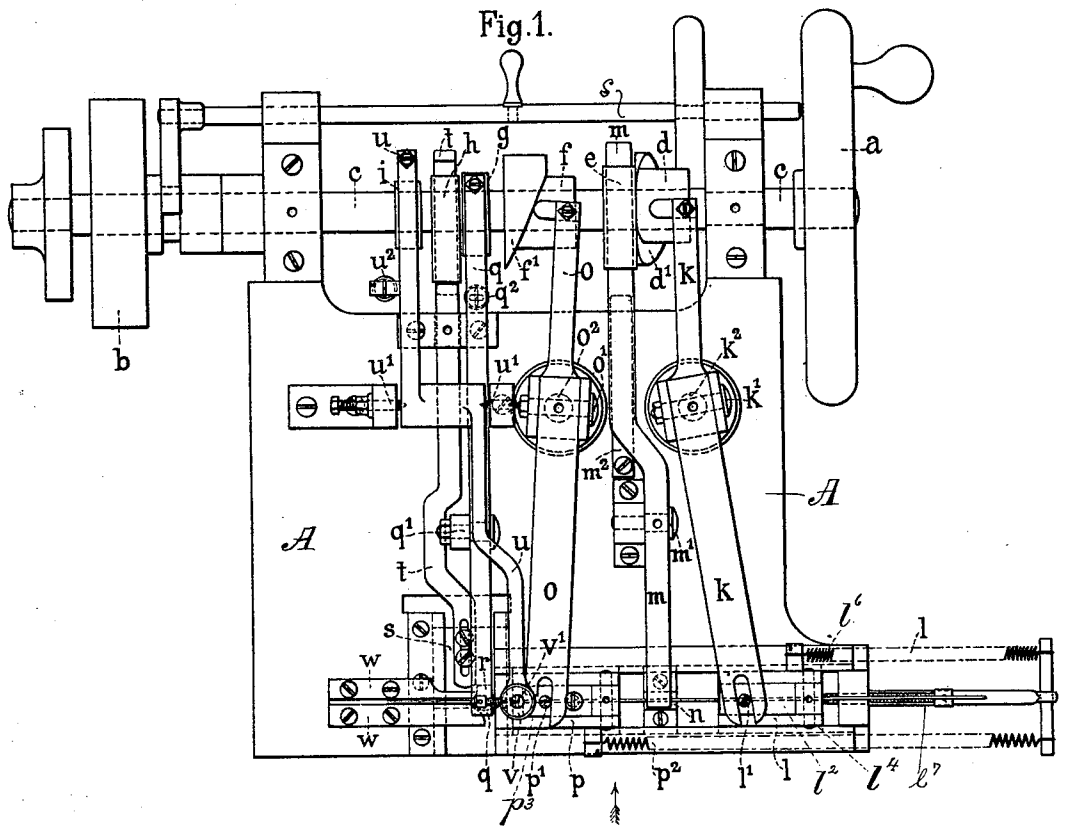

Fig. 3.

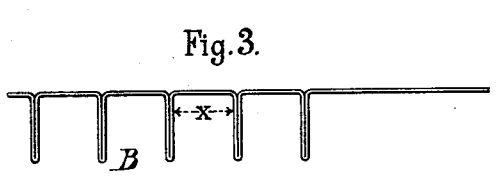

Fig. 2.

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UNITED STATES PATENT OFFICE.

WILHELM DECKER, OF MITTWEIDA, SAXONY, GERMANY.

MACHINE FOR CONVERTING WIRE INTO A CONTINUOUS ROW OF CLAMPS.

SPECIFICATION forming part of Letters Patent No. 403,923, dated May 28, 1889.

Application filed October 23, 1888. Serial No. 288,893. (No model.)

To all whom it may concern:

Be it known that I, WILHELM DECKER, of Mittweida, Kingdom of Saxony, Germany, have invented certain new and useful Improvements in Machines for Converting Wire into a Continuous Row of Clamps or Similar Articles, of which the following is a specification.

This invention relates to the construction of a machine by which wire of any suitable cross-section is automatically converted into a continuous row of clamps or similar articles, and it is more particularly adapted for making the clamps that are indicated in Figure 3 of the annexed drawings. Such continuous row of clamps I preferably use for fastening card-clothing to the flats of carding-engines, as specified in an application made by me for Letters Patent of the United States, filed October 19, 1888, Serial No. 288,531.

Reference is to be had to the annexed sheet of drawings, in which—

Figure 1 is a plan view of my improved machine. Fig. 2 is a side view of the machine, looking in the direction of the arrow in Fig. 1. Fig. 3 is a side view of the product of the machine.

In Fig. 1, *c* is the main shaft of the machine, worked either by hand, by hand-wheel *a*, or by power by the pulley *b*, connected to a suitable shipper-bar, S. On this shaft *c* a series of cams or eccentrics, *d e f g h i*, are mounted, of which *d* and *f* are provided with side cam-faces, *d'* and *f'*, respectively. On the cam *d* rests the rear end of a lever, *k*, which is arranged to swing on the table A of the machine in two directions—viz., vertically on the horizontal bolt *k'* and horizontally on the vertical bolt k^2. The free or front end of the lever *k* is forked and straddles a pin, *l'*, fixed to the movable jaw l^2 of tongs *l*. The jaw l^2 is pivoted, as at l^4, in the tongs *l*, and in its normal condition is kept open by means of a spring, l^6, and is closed in due time by the action of the cam *d* on lever *k*. Said tongs *l* are movable longitudinally within guides on the machine-table by means of lever *k*, when the same is actuated by the side face, *d'*, of the cam *d*. The action of the tongs is to seize the wire between its movable jaw l^2 and the stationary part and to transport or shift a proper length of wire when the tongs are moved longitudinally by the lever *k*. This length of wire will correspond to the length of stem *x*, Fig. 3, between two shanks of the continuous row of clamps B. As soon as this is completed, the action of cam *d* and *d'* will temporarily cease, the movable jaw of the tongs will open by the action of the spring l^6, and said spring l^6 will draw the tongs back into the first position against an adjustable screw-stop, l^7, ready for another seizure of wire and another feed.

m is a lever adapted to turn on a pivot, *m'*, mounted on the machine-table A. The front or outer end of the lever *m* is pressed down on a block, *n*, carried by the table A, by means of a spring, m^2, in order to hold fast that length of wire, which at the proper moment is fed by tongs *l*. The rear end of the lever *m* contacts the under side of the cam *e* on the shaft *c*, so that the front end of the lever *m'* will intermittingly be raised, so as to free the wire and allow it to pass over the block *n*.

On the cam *f*, carried by the shaft *c*, rests the rear end of a lever, *o*, which, similarly to the lever *k*, is capable of swinging in two directions—vertically on the horizontal bolt *o'* and horizontally on the vertical bolt o^2, these bolts being mounted on the machine-table A. The front end of lever *o*, which is bifurcated, straddles a pin, *p'*, situated on the movable jaw p^3 of tongs *p*. The tongs *p* have longitudinal movement in guides on the table A.

The jaw p^3 is kept open by a spring, p^2, which jaw is closed by the action of the cam *f* upon the lever *o*, while the action of the cam side face, *f'*, upon said lever will shift the tongs *p* in longitudinal direction, this shifting of the tongs *p* bending the wire into shanks at right angles to the main stem. As soon as the action of the cams *f* and *f'* temporarily ceases, the jaw p^3 will open by spring action and the entire tongs *p* will be receded into normal position by means of spring p^2.

q is a lever mounted to swing vertically on the pivot *q'*, the rear end of the lever *q* being pressed by a spring, q^2, upon the cam *g*, carried by the shaft *c*, so that the cam will periodically press down the outer or front end of lever *q*, which, during the formation of a

clamp, thereby holds the wire down upon an anvil, *r*, against which anvil said formation takes place.

In order that the wire formed into clamps may be shifted forward, the anvil *r* should be withdrawn out of the line of passage of the wire or clamps, for which purpose the anvil *r* is mounted on a slide, *s*, formed by a dovetail or other shaped block, *s*, guided in suitable bearings on the table A. This block *s* is connected to a rod, *t*, which is guided in suitable bearings on the machine-table A. The rod *t* is bifurcated at its rear end, the fork being bent and surrounding the cam *h* on the shaft *c*, so that the latter at the proper period may cause the anvil *r* to advance or recede; but the rod *t* may be connected with the cam *h* by a strap or otherwise.

u is a lever, which may swing vertically on the center pins, *u'*, the inner or rear end of lever *u* being pressed by a spring, u^2, against the cam *i* on the shaft *c*. The outer or front end of said lever *u* carries a head, *v*, in which a rod, *v'*, is arranged, the position of which may be properly adjusted by set-screws. The rod *v'*, under the action of the cam *i*, causes the indent of **V** shape, as seen in Fig. 2, into that length of wire which is kept between the wire-holder *q* or anvil *r* and tongs *p*, while tongs *p*, by periodically advancing, causes the pressing together of this **V**-shaped length of wire, so that this part of the wire now forms one shank of double wire at right angles to the stem.

w w are guides to lead the continuous row of clamps for a short distance through the machine.

I may mention that I prefer to provide some parts of my mechanism—such as the cams *f* and *i* and the rear ends of the levers *k*, *o*, and *u*, which are exposed to repeated action of cams or eccentrics, and which action must begin at a certain moment—with adjustable devices—such as noses—the exact position of which may be regulated by screws, &c.

My machine operates as follows: In the first instance, and before starting the machine, the wire-holder *m* is pressed up by pressing it down at its rear end by hand, and is kept in this position until the straight wire coming from any conveniently-situated reel is introduced through the open tongs *l*, the open holder *m n*, and tongs *p* and fed over the anvil *r*, whereupon the rear of the wire-holder *m* is released, and this holder now, by the action of the spring m^2, keeps the wire down upon the block *n*. In this instance the distance between the tongs *p* and anvil *r* corresponds to the length of wire which is necessary to form a shank or clamp of double wire, as indicated in Fig. 3. Now the machine is started either by hand or power, in consequence of which the tongs *p* and the wire-holder *q* will close, whereupon the rod *v'* will descend, in order to form the **V**-shaped bend in the wire. At the proper instant, while the rod *v'* in its descent touches the wire, the wire-holder *m* will open, whereupon tongs *p* will slide toward the anvil *r* and the rod *v'* will press the **V**-shaped bend into the wire. Then the rod *v'* rises and the tongs *p* advance to press the **V**-shaped part of the wire into a clamp and against the anvil *r*. As soon as the shank of double wire is thus formed by pressure, tongs *l* will close to grasp the wire, while the wire-holder *q* and tongs *p* will open, the anvil *r* will be withdrawn in backward direction, and the tongs *p* will recede into the original position, whereupon the tongs *l*, by the side movement of the lever *k*, communicated to it, will shift the wire to a distance corresponding to the length of the stem *x*, Fig. 3, between two shanks. The holder *m* will then close, the anvil *r* will be advanced, and the holder *q* will close, in order that the wire may be held upon the anvil *r*, after which the tongs *l* will open and recede to its original position, the tongs *p* will close, the wire-holder *m* will open, the rod *v'* will descend and reascend, and tongs *p* will advance to complete the clamp, as before stated. This movement of the parts will be continually repeated, in order to convert a straight wire into a continuous row of clamps, such as is in part indicated in Fig. 3.

Having now described my invention, what I claim is—

1. In a machine for converting straight wire into a continuous row of clamps, the combination of the anvil *r* and holder *q* with the sliding tongs *p* and reciprocating wire-bending rod *v'*, the holder *q* being above the anvil, substantially as described.

2. The combination, with the anvil *r*, holder *q*, sliding tongs *p*, wire-bending rod *v'*, and means for moving the tongs *p* to press the wire against the anvil *r*, of the sliding tongs *l*, substantially as described.

3. The combination, with the anvil *r*, holder *q*, sliding tongs *p*, wire-bending rod *v'*, and wire-holder *m n*, of sliding tongs *l*, for feeding the wire into the machine, and means for moving the tongs *p* to press the wire of the clamp against the anvil *r*, substantially as described.

4. In a machine for bending wire into continuous clamps, the sliding tongs *p*, for feeding wire, combined with the anvil *r* and holder *q*, and means for moving the anvil in a direction at right angles to the feed of the wire, and the holder *q*, movable at right angles to the motion of the anvil, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

WILHELM DECKER.

Witnesses:
WILHELM WIESENHÜTTER,
MARTIN KÖRNER.