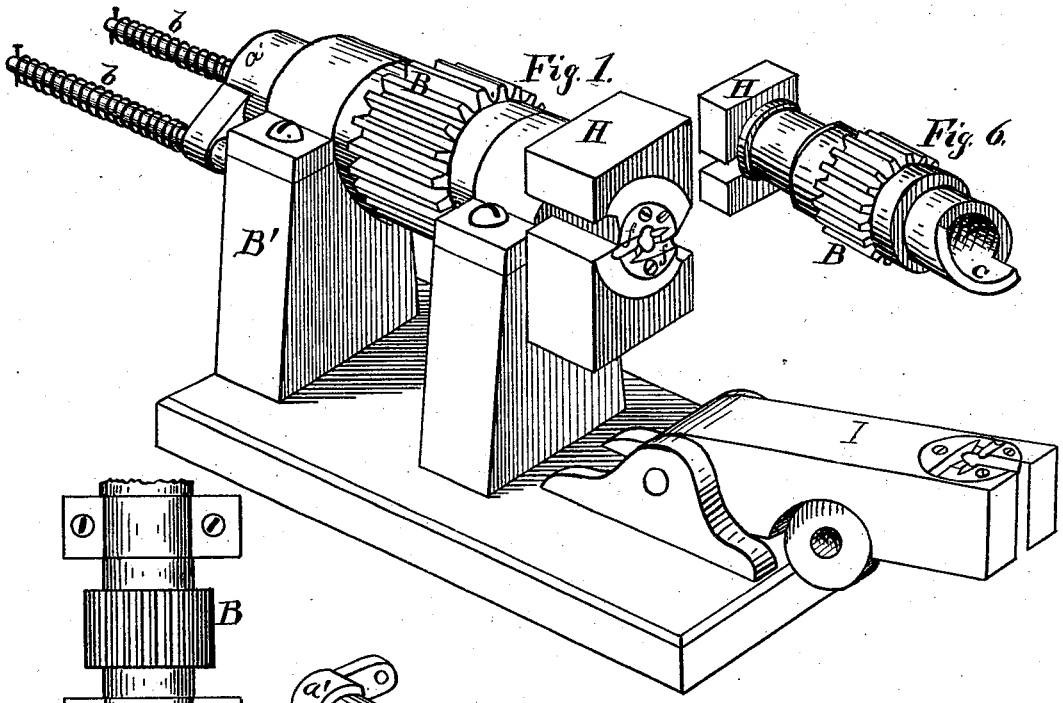
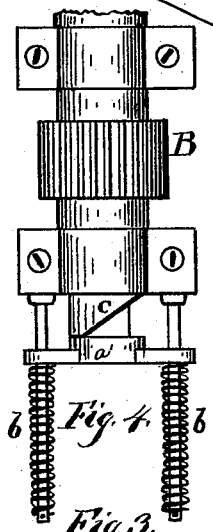
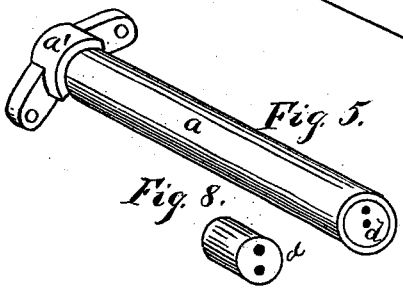
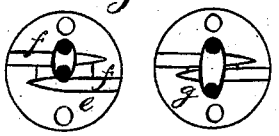
F. BILLINGS.
Wire-Barbing Machines.

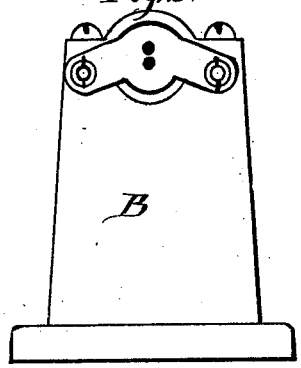
No. 209,544. Patented Nov. 5, 1878.

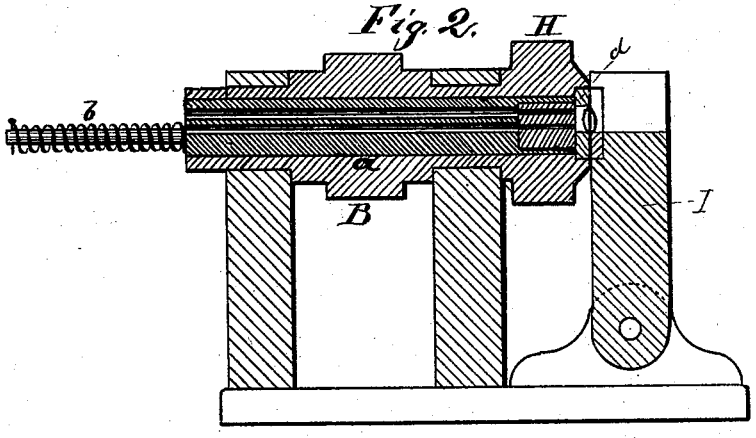












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UNITED STATES PATENT OFFICE.

FRANK BILLINGS, OF CLEVELAND, OHIO.

IMPROVEMENT IN WIRE-BARBING MACHINES.

Specification forming part of Letters Patent No. **209,544**, dated November 5, 1878; application filed July 24, 1878.

To all whom it may concern:

Be it known that I, FRANK BILLINGS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines for Making Barb Fence-Wire, which improvements are fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a perspective view. Fig. 2 is a longitudinal section. Fig. 3 is an end view. Fig. 4 is a top or plan view. Fig. 5 is a detached view of the core of the barb-twisting spindle. Fig. 6 is a detached view of the spindle or hollow shaft, showing the beveled end; Fig. 7, detached views of twisting-dies. Fig. 8 is a detached view of a bushing which is contained in the end of the core.

The object of this improvement is to furnish a device to be attached to the hollow shaft of my wire-barbing machine, for which a patent was granted the 18th day of June, 1878, as an improvement thereon, for the purpose of making a variety of barbed fence-wire.

In the said machine there is contained a hollow shaft, B, carrying a rotating cutting and twisting head, H, in which is contained a die, *e*, having a central aperture, through which the main wire or strand passes in the operations of the machine. The said die has two grooves, into which the barb-wires are fed, which are so located in relation to the said central opening that the barb-wires will lie one on each side of the main strand. The object of this construction of the die is to wrap or coil the barbs around the outside of the main strand.

The object of the improvement is to so construct the dies that the said barb-wires may be both fed between the two main wires, or that one of the barb-wires will be fed between the two main wires and the other outside, producing different results.

This is accomplished as follows: The aperture through the die for feeding one barb-wire between the two main wires and one outside is made in oval form, with one end of the oval at the center of the die, so as to have the two main wires spread apart sufficiently to allow the barb-wire to pass between them, the grooves in the face of the die being arranged to lead the barb-wires one in between and the other outside of the two main wires.

To accomplish the other the central opening in the die is also made oval in form, but longer in its major axis, and is across the center, while the grooves in the face are close together. In this case the two main wires are spread farther apart and the barb-wires are both fed between the two main wires.

In the first instance the coiling of the barb-wires by the rotating head produces this result—that is, one of the barbs embraces in its coil one only of the main wires, while the other barb in its coil embraces both of the main wires and the other barb. This barbed wire is the subject of my patent of June 25, 1878.

In the second instance the result differs from the first in this, that the two barbs, being both passed between the main wires when coiled, are linked together between the main wires, and each barb in its coil embraces one of the main wires.

In the accomplishment of these results it has been necessary to provide a guide through the aforesaid hollow shaft B for directing the main wires through the die at the proper places. The said guide consists of a core, *a*, fitted within the shell of the hollow shaft, and has an independent movement imparted to it back and forth within the shell by means of an incline, *c*, on the end of said shell, bearing against a similar incline on a cross-head, *a'*, on the end of the core *a*, the said cross-head playing on two rods, *b b*, extending outward from the post B'. Springs placed on the rods *b b*, between their heads and the cross-head, serve to force the core inward when released by the incline. Through said core are made two longitudinal bores, one for each of the two main wires, and in the end of the core next to the head H is put a steel bushing, *d*, having two holes, through which the main wires pass. These holes are located so as to hold the said main wires in the central aperture of the die, in accordance with the barb-grooves in the face of the die, while the barbs are being fed therein.

The aforesaid outward movement is given to the core *a* for the purpose of providing

space between its end and the die for the main wires to turn in during the revolution of the head H in wrapping on the barbs. Without this space the main wires would be twisted and kinked. When the head H revolves back again, after the barbs have been put on, the the core *a* recedes by the force of the springs; then the feeding forward of the main wires, and also of the barb-wires, again takes place while the said core is in near the die. It is then that the core serves as a guide and holder of the main wires. The incline on the end of the shell is so arranged in its relation with the core *a* as to immediately force the said core outward when the head begins its revolution for putting on the barbs.

The operation of this core attachment is as follows: When the main wire is to be fed forward the hollow shaft is at rest, with the head H in position ready to perform its revolution for cutting off the barbs. Before this revolution takes place, however, the main wire must be moved forward, for which purpose the block I is dropped, permitting the finished barbs to pass. During this movement of the main wire forward the core *a* is lying in the shaft up against the die in the head H, in which position it serves as a guide for the said main wires, and holds them in the required position through the die to receive the barb-wires. When the movement of feeding the wires forward is completed, then the shaft begins to revolve, and then the incline on its end forces the core outward. This makes room between the end of the core and the die within the said shaft for the main wires to turn in, else they would be bent or cut off. The core is held in this outward position during the revolution of the shaft by the said incline bearing against the cross-head.

Having described my invention, I claim—

1. The die *e*, having the oval opening placed one side of the center, as shown, and having the grooves *f f* arranged in relation to the said oval opening so that one barb may be passed between the two main wires and the other barb pass out one side of the main wires, as described, and for the purpose specified.

2. The die *g*, having an elongated oval opening across its center, and the grooves *f f* arranged close together across the center of the face of the die, so that both the barb-wires will be made to pass between the main wires, as described, and for the purpose specified.

3. The core *a*, in combination with the hollow shaft or shell B, and rotating cutting and coiling head H, as and for the purpose specified.

4. In combination with the core *a* and hollow shaft or shell B, the rods *b b*, with their springs, and the inclines *c* on the end of the shell and on the cross-head *a'*, for imparting the back and forth movement to the said core, substantially as described.

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