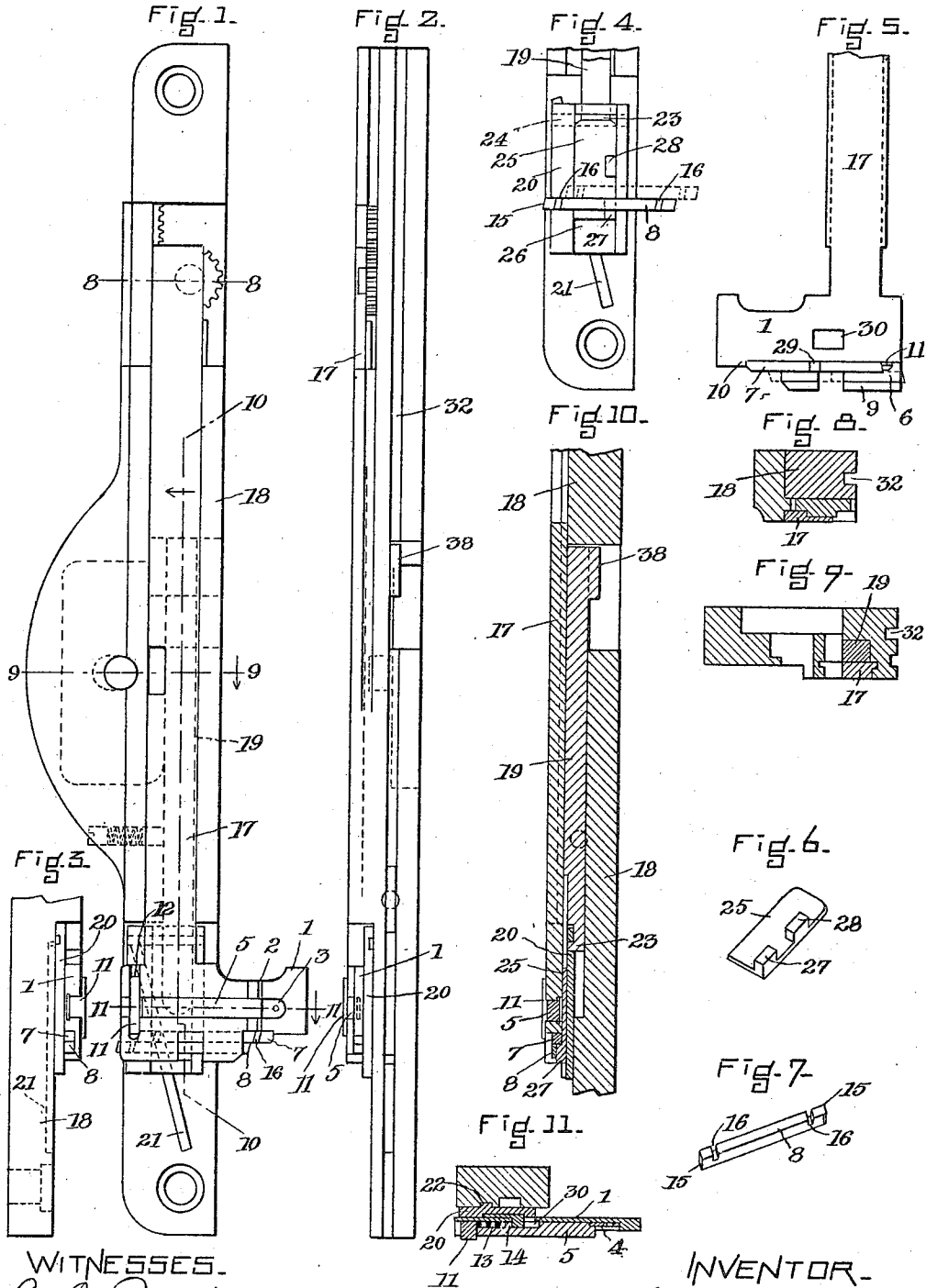


971,247.

Patented Sept. 27, 1910.

2 SHEETS-SHEET 1.



WITNESSES.
A. C. Retigan
P. H. Pezzetti

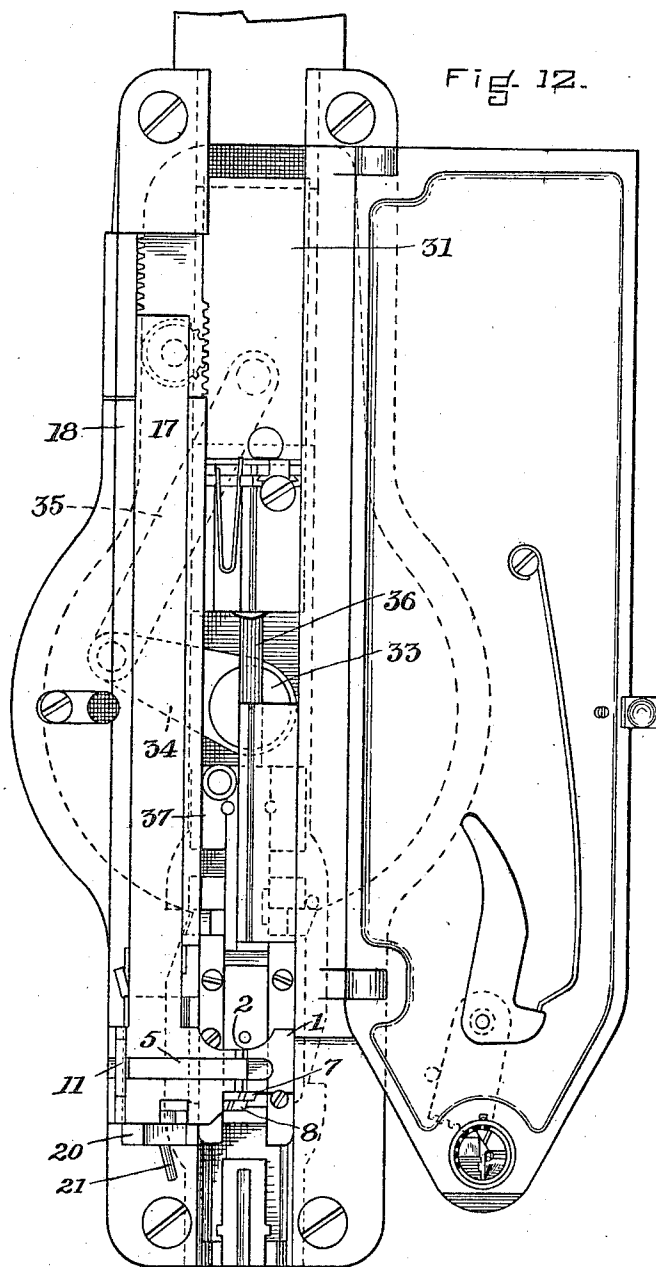
INVENTOR.
Thomas A. Briggs
By *Wm. B. Lundy* May
Atty.

971,247.

T. A. BRIGGS.
WIRE CUTTER.
APPLICATION FILED JUNE 12, 1909.

Patented Sept. 27, 1910.

2 SHEETS—SHEET 2.



WITNESSES.
A. C. Ratigan
P. H. Pezzetti

INVENTOR.
Thomas A. Briggs
by *Wight Brown Lindy May*
Atty.

UNITED STATES PATENT OFFICE.

THOMAS A. BRIGGS, OF EAST GREENWICH, RHODE ISLAND, ASSIGNOR TO BOSTON WIRE STITCHER COMPANY, OF EAST GREENWICH, RHODE ISLAND, A CORPORATION OF MAINE.

WIRE-CUTTER.

971,247.

Specification of Letters Patent. Patented Sept. 27, 1910.

Original application filed May 25, 1908, Serial No. 435,174. Divided and this application filed June 12, 1909. Serial No. 501,749.

To all whom it may concern:

Be it known that I, THOMAS A. BRIGGS, of East Greenwich, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Wire-Cutters, of which the following is a specification.

This invention relates to mechanism for cutting wire, and is a division of the application filed by me May 25, 1908, Serial No. 435,174.

The object of the present invention is to provide a cutting apparatus which may be capable of long and continuous service without renewal of the cutting elements or knives, by reason of the construction of such cutting elements with a number of cutting edges and with capacity for reversal and interchanging.

Another object is to construct the cutting apparatus and the device by which the cutting elements are operated so that the same may be conveniently applied to wire-working machines, such for instance as wire stitchers, in which lengths of wire are cut and formed into staples preliminary to driving.

The main use for which this cutting device is intended is in connection with a wire-stitching machine wherein the wire is fed in a direction parallel to that in which the staples are driven, and in which also the cutting device is operated by the driver to sever the wire, although the invention is not limited to such use, but may be employed in connection with other wire-working machines, or independently of any machine if desired.

Of the accompanying drawings,—Figure 1 represents a front elevation of the cutting apparatus. Fig. 2 represents a side elevation of the same as seen from the right of Fig. 1. Fig. 3 represents a side elevation as seen from the left of Fig. 1. Fig. 4 is an elevation of the cutter-actuating mechanism. Fig. 5 is an elevation of the cutter holder, showing the rear side thereof. Fig. 6 is a perspective view of one of the members by which connection is made from the knife to the knife actuator. Fig. 7 is a perspective view of one of the reversible and interchangeable knives employed in the wire cutter. Fig. 8 is a cross-section on line 8—8 of Fig. 1. Fig. 9 is a cross-section on

line 9—9 of Fig. 1. Fig. 10 is a longitudinal section of the device on line 10—10 of Fig. 1. Fig. 11 is a cross-section on line 11—11 of Fig. 1. Fig. 12 is an elevation showing the mode of application of the wire cutter to a wire-working machine, such for instance as one which forms and drives staples.

The same reference characters indicate the same parts in all the figures.

The cutting mechanism consists of a bracket or holder 1 which projects across the path in which the wire to be cut is fed, and which has a groove or channel 2 to receive and guide the wire. Intersecting the groove 2 is a transverse clamp-guiding groove or channel 3 in the end of which is set a stationary wire clamp 4 and a movable clamp 5, these clamps being set on opposite sides of the groove 2 and cooperating to clamp a wire passing through said groove.

Beside and beyond the clamp groove 3 is a second groove in the face of the holder 1, forming a channel or guideway 6 which contains the cutters or knives 7 and 8. These knives are preferably formed as prismatic bars of equal cross-sectional outline and area, and are placed side by side, being of such a width as to fit snugly within the groove 6, but not too tightly to prevent longitudinal movement of one of the knives, as for instance the knife 8. The groove or guideway 6 is bounded by the body of the bracket and by a lip 9 which supports the movable knife 8. The knife 7 is stationary and is held immovably by a shoulder 10 against which one end of the knife abuts, and by a key 11 detachably held in the bracket and forming a removable abutment for the opposite end of the knife. This key is contained in a key groove 12 which extends transversely of the clamp channel and cutter guideway, crossing the former and extending into the latter, so that the key not only serves as an abutment for the stationary knife, but also as an abutment for a spring 13 which is contained between the key and a shoulder 14 of the movable clamp 5 and normally tends to press the same toward the clamp 3 and grip the wire.

The knives 7 and 8 are duplicates of each other and are reversible and interchangeable. Each knife has cutting edges at its opposite ends and intermediate grooves 16 in one of its sides set somewhat inward

from both ends. These grooves form channels or passages for the wire and are located so that when one of the knives is set against the abutment 10, one of its grooves 16 comes into alinement with the wire guide 2 of the holder. The intersection of one side of each groove with the side or bottom surface of the cutter forms a sharp cutting edge, and the movable knife is so mounted that its end edge travels across the groove and acts in coöperation with the cutting edge thereof to shear off sections of wire. Either knife may be mounted between the fixed and movable abutments 10 and 11 so that either of its grooves is in position to receive the wire while the other knife may be located so that either of its ends may travel across the wire containing groove of the first knife. It will be thus seen that each knife is provided with four edges of which any one may be used, and that whenever one of the edges of either or both knives becomes dull, a reversal or interchanging of the knives provides a fresh sharp edge and avoids the necessity of sharpening or of substituting new knives, thus greatly prolonging the life of the knives.

The holder 1 is adapted to be adjusted to enable sections of wire varying in length to be cut off, and for that purpose it is conveniently made as a part of or attached to a slide 17 contained movably in a guide, or otherwise slidably held in a suitable supporting device, of which an example is represented by 18 in the drawings.

Reciprocation of the movable knife is effected by means of an actuator 19 which is driven reciprocatively by suitable means, the direction of its reciprocation being in this embodiment of the invention transverse to that in which the knife reciprocates. This renders necessary the interposition of connecting means between the actuator and the knife, which will transform the motion of the former into movement transverse thereto in the latter, and will also permit adjustment of the knife carrier and knives to take place without affecting or disabling the connection between the knife and actuator. The intermediate connection between the actuator and the knife is a member or slide 20 which is engaged with the actuator and is guided to move in a path intermediate or inclined to those of both the actuator and the knife. The means for causing the slide thus to move in an independent path is a cam member, preferably a groove 21, in the body or support 18, into which projects a rib 22 on the slide. This cam member being inclined, causes the slide to travel laterally with respect to the actuator 19, while to permit of such movement a sliding engagement between the actuator and slide is afforded, by means of a tongue 23 on the actuator entering a groove or recess 24 in the back of

the slide. This groove or recess extends transversely of the motion of the actuator. A key member 25 is guided in a space 26 between parallel ribs of the slide 20 and has two projections or ribs 27 28 respectively, the former of which enters a recess 29 in the side of the movable knife. It should be noted that each knife has a recess 29 in the rear side, or the side opposite to that in which the grooves 16 are formed, and the rib 27 is so limited as to enter the recess of the movable knife only, and to travel clear of the fixed knife. The other rib 28 passes into a socket or aperture 30 in the holder 1, and is guided by the walls of said aperture, being prevented thereby from rising or descending. This rib or projection 28 extends far enough through the aperture 30 to engage the tongue 14 of the movable clamp 5. When the actuator descends, the slide 20 is also lowered, and by reason of the cam groove 21, is moved to the right as well. This movement shifts the key plate and transmits longitudinal movement to the knife 8. At the same time, the clamp 5 is released and allowed to move under the pressure of its spring 13 to grip the wire. When the actuator is raised, the movements of the parts are reversed, the movable knife is retracted and the clamp 5 separated from the complementary clamp. It will be understood that the slide 20 moves at an inclination with respect to both the actuator and key member 25, sliding laterally with respect to the actuator and having an up-and-down motion relatively to the key member. The latter is constrained by the rib 28 in the aperture 30 to travel only in a horizontal direction. When the knife carrier is adjusted, this key member is moved with it and slides in the groove 26 of the traveler 20, which has sufficient length to permit as great an amount of adjustment as necessary, while retaining the operative connection with the actuator.

When this wire cutter is applied to a wire stitcher, the actuator 19 is preferably driven by the staple driver of such machine and is associated therewith, as shown in Fig. 12. The support 18 for the cutting apparatus here constitutes one of two guides for a cross-head 31 which has ribs extending into guiding grooves 32 of the guides. This cross-head is reciprocated by means of a shaft 33, a crank 34 and connecting rod 35, and attached to it is a driver bar 36. Also carried by the driver bar is a slide 37 separated somewhat from the cross-head 31. On the actuator 19 is a lug 38 (Figs. 2 and 10) which projects into the groove 32 between the cross-head 31 and slide 37, and is struck alternately by the latter members upon each reciprocation of the driver bar, whereby the movable knife is alternately shifted back and forth and the clamp 5 released and allowed to engage the wire.

I claim:—

1. A wire-cutting mechanism comprising a knife-holder, having a knife groove in one face thereof, two knives mounted in said groove, one being secured immovably to one wall of the groove, and the other being guided to move beside said first knife between the latter and the other wall of the groove.

2. A wire-cutting mechanism comprising a knife holder, a stationary knife secured to said holder and having a recess of uniform width in a side thereof, in which the wire to be cut is placed, the intersection of the side wall of such recess with a side of the knife forming a cutting edge, and a second knife held movably by said holder and constrained to travel so that its cutting edge is caused to travel past that of said first knife to cooperate with the latter in shearing the wire.

3. A wire cutter comprising a pair of interchangeable knives arranged side by side and relatively movable, one of said knives having an operative cutting edge intermediate its ends and a reserve cutting edge at its end, and the other having an operative cutting edge at its end, with a reserve cutting edge between its ends.

4. A wire cutter comprising a pair of knives of equal cross-sectional outline and area, arranged side by side and relatively movable in the direction of their length, one of said knives having a cutting edge intermediate its ends and transverse to its length, and the other having a cutting edge at its end.

5. A wire cutter comprising a stationary reversible bar-like knife having a transverse groove or passage in one face near each end for the wire, the intersection of the wall of which groove with the side of the knife forms a cutting edge, and a complementary reversible knife having an edge at each end movable past and beside the cutting edge of said first knife.

6. A wire cutter comprising a pair of bar-like knives placed side by side and each being reversible, end for end, one of which is movable relatively to the other in the direction of their length, one of said knives having two transverse passages for the wire, either of which is operative at one time, of which passage a side of each, by its intersection of one of the surfaces of the knife, forms a cutting edge, and the other of said knives having complementary cutting edges, either of which is operative, according to the position of the knife, to cooperate with the operative cutting edge of the aforesaid knife, upon relative movement of the knives in shearing the wire.

7. A wire cutter comprising a pair of interchangeable knives arranged side by side, each having a cutting edge at its end and a

wire channel between its ends terminating in a cutting edge, and being so located that the end edge of one of said knives is enabled to travel across the wire channel of the other knife and past the cutting edge thereof.

8. A wire cutter comprising a pair of reversible interchangeable knives, each having cutting edges at both ends and an intermediate wire channel terminating in a cutting edge at the intersection thereof with a face of the knife, and means whereby either knife may be held stationary and the other moved to carry one of its cutting edges past the wire channel and adjacent cutting edge of the other.

9. A wire cutter comprising a pair of reversible interchangeable knives, each having cutting edges at both ends and an intermediate wire channel terminating in cutting edges at the intersection thereof with a face of the knife, and a holder in which said knives are contained side by side, one of them being held stationary and the other being movable so that one of its cutting edges may travel past the wire channel and cutting edge of the other.

10. A wire cutter comprising a pair of bar knives each having cutting edges at both ends and an intermediate wire channel near each end, each such channel terminating in a cutting edge, and a holder for said knives whereby one may be held stationary and the other constrained to move so that one of its ends will move across one of the channels of the first knife.

11. A wire cutter comprising a pair of bar knives each having cutting edges at both ends and an intermediate wire channel near each end, each such channel terminating in a cutting edge, and a holder for said knives whereby one may be held stationary and the other constrained to move so that one of its ends will move across one of the channels of the first knife, said knives being reversible, end for end, and interchangeable, one for the other, whereby all of their cutting edges may be utilized in turn.

12. A wire cutter consisting of a holder having a guideway, and a supporting lip forming one wall of said guideway, a pair of knives, having cooperating cutting edges, contained in said guideway, and means for holding one of said knives immovable, the other being movable in the guideway and supported by said lip.

13. A wire cutter comprising a holder having a knife guideway and an abutment extending into said guideway, a pair of knives contained side by side in said guideway with one of them bearing at its end against said abutment, and a displaceable abutment engaging the other end of said knife, whereby the same is held stationary, the other knife being free to move along the guideway.

14. A wire cutter comprising a holder having a knife guideway and an abutment extending into said guideway, a pair of knives contained side by side in said guideway with one of them bearing at its end against said abutment, and a key contained in a slot in said bracket and bearing against the other end of said knife, whereby the same is held stationary, the other knife being free to move along the guideway.

15. A wire cutter comprising a holder having a cutter guideway and a wire guide transverse to one another, a clamp arranged to cross said wire guide and hold the wire therein, a spring tending to close said clamp upon the wire, cooperating cutters contained in said cutter guideway, and a key serving to hold one of said cutters stationary and also as an abutment for said spring.

16. A wire-cutting apparatus comprising a support, a cutter holder mounted adjustably on said support, said holder having a wire-receiving channel and a cutter guideway transverse to said channel, and a pair of cooperating cutters located in said guide-

way, one of said cutters being stationary and the other being movable, each of the cutters having a plurality of cutting edges, and being interchangeable for utilization of all the cutting edges in turn.

17. A wire-cutting apparatus comprising a cutter holder, cooperating cutters mounted in said holder, one of which is stationary and has a cutting edge and the other of which is movable rectilinearly and has a cutting edge movable past the cutting edge of said stationary cutter, reciprocating means for operating the said movable cutter, arranged to travel in a direction transverse to the movements thereof, and connecting means between said cutter and its operating means independently guided to move in a path intermediate to those of both the cutter and the operating means.

In testimony whereof I have affixed my signature, in presence of two witnesses.

THOMAS A. BRIGGS.

Witnesses:

CHARLES E. SWEET,
EDWARD E. SPENCER.