

No. 713,078.

Patented Nov. 11, 1902.

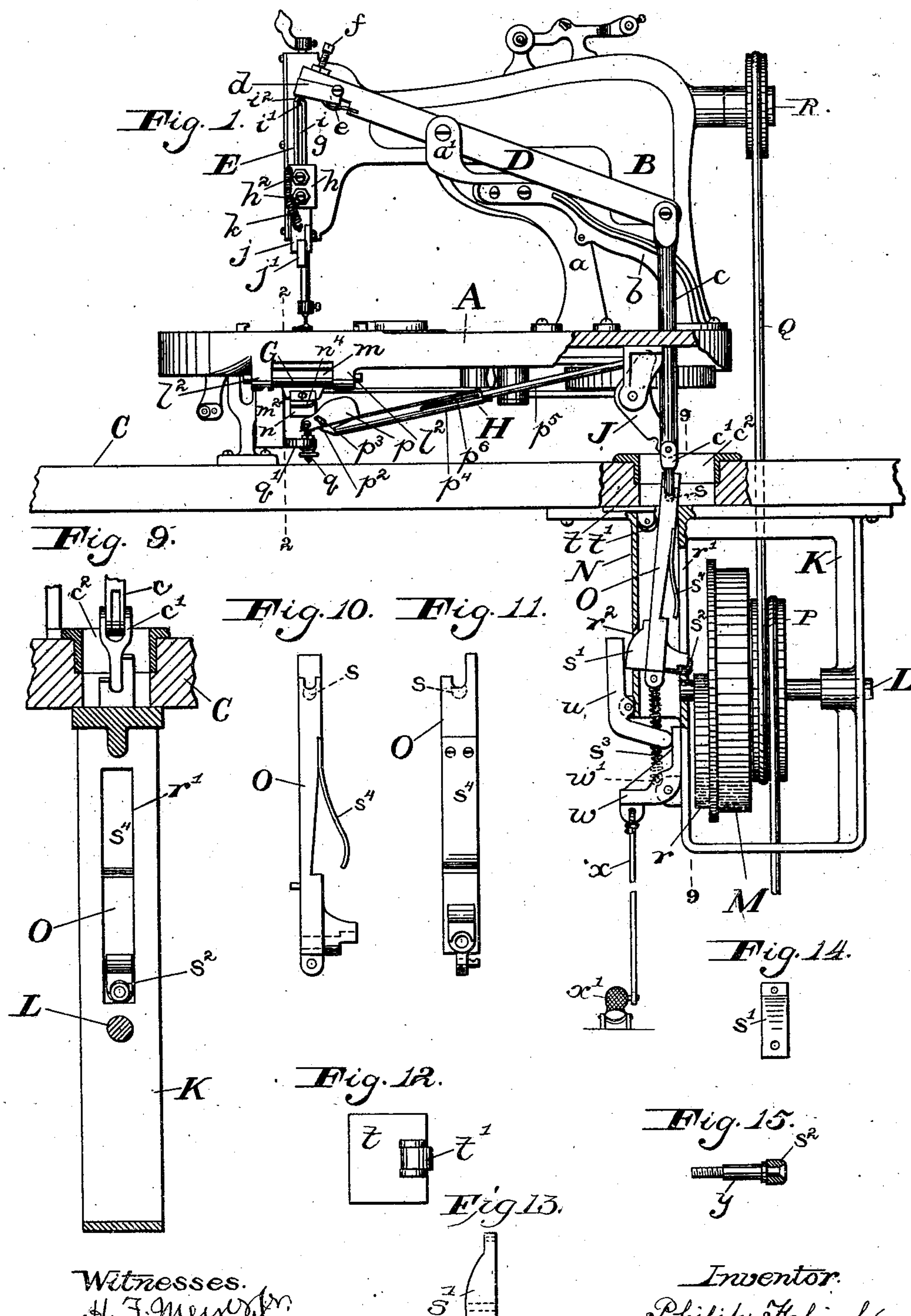
P. FABISCH.

POWER CUTTING ATTACHMENT FOR BUTTONHOLE SEWING MACHINES.

(Application filed Oct. 21, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
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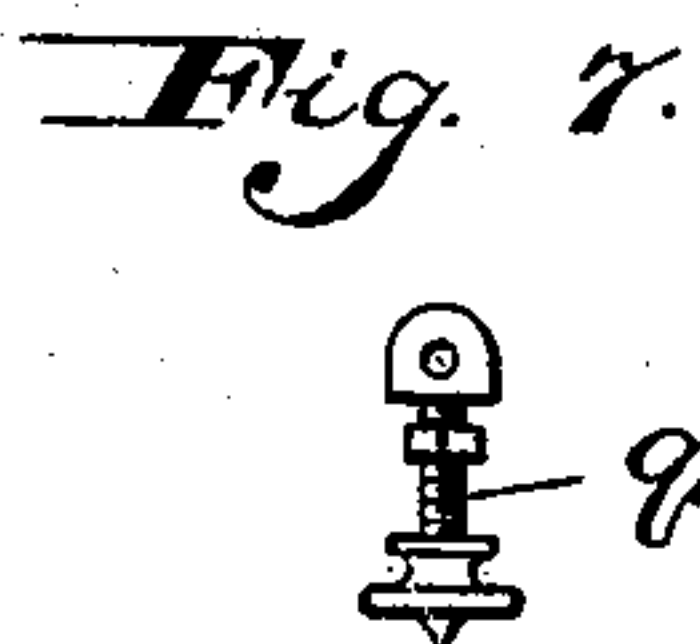
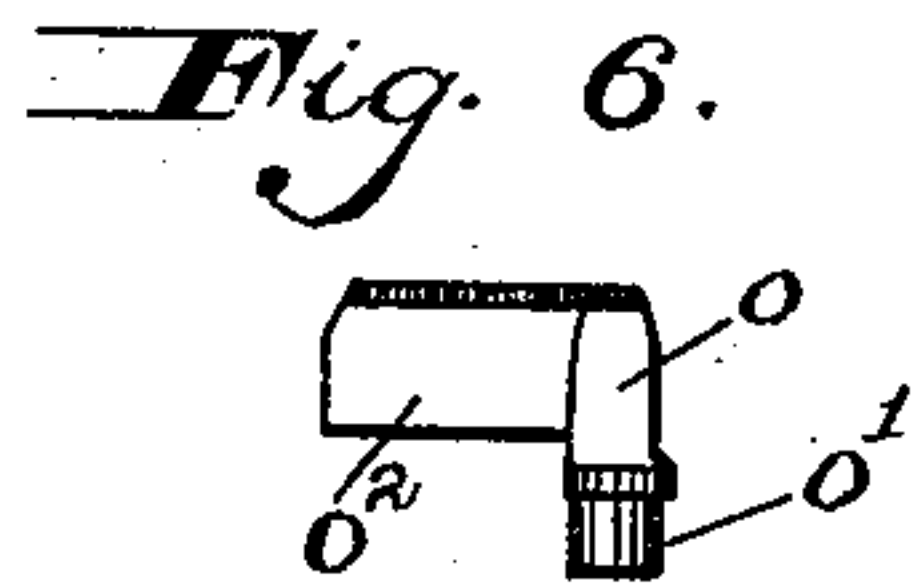
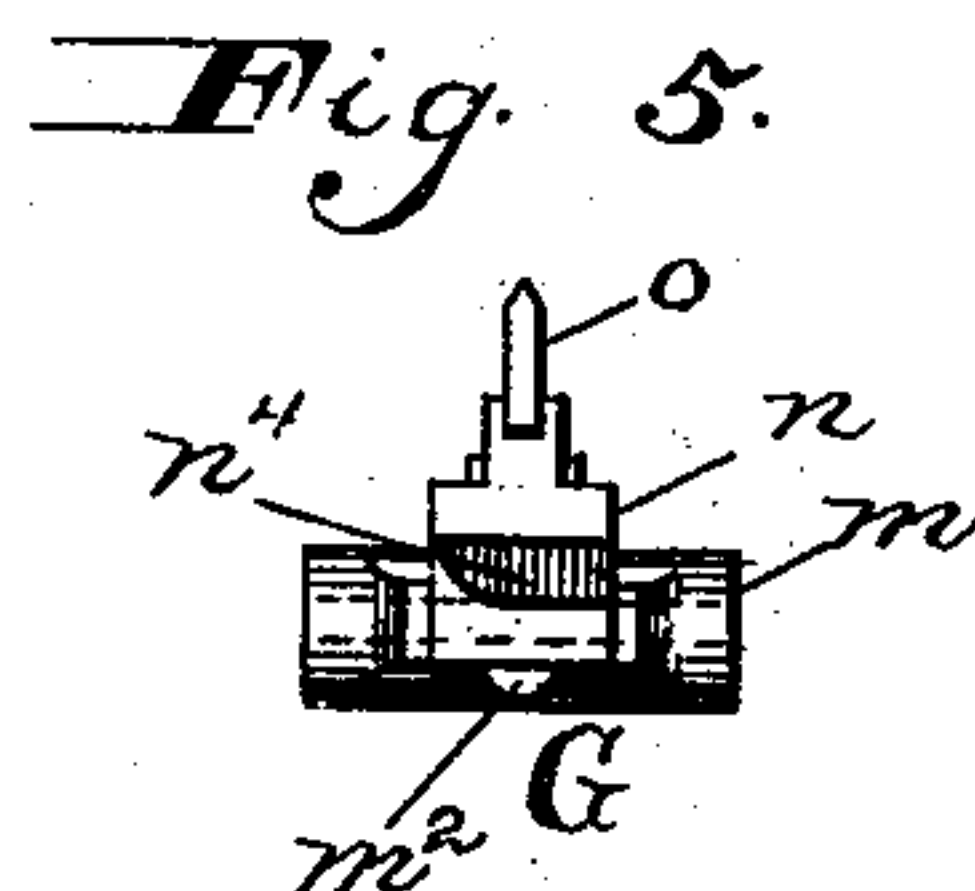
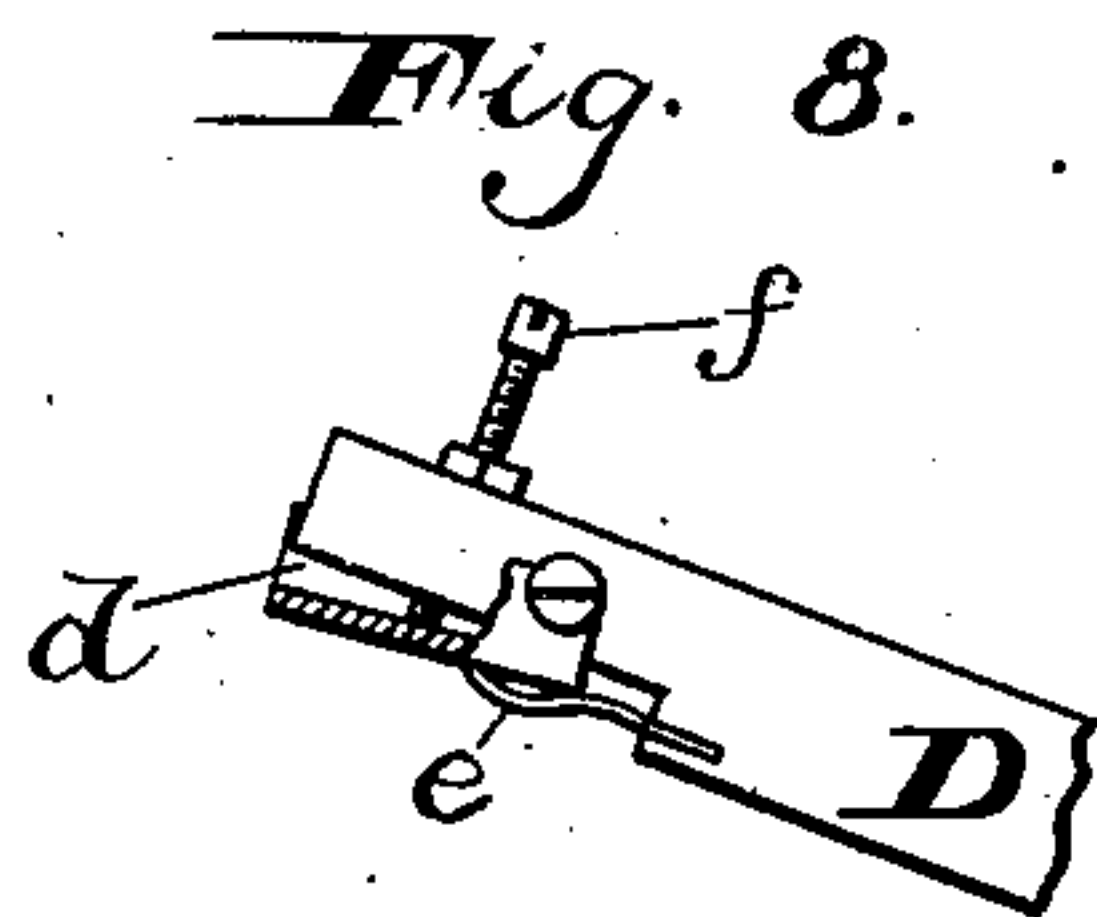
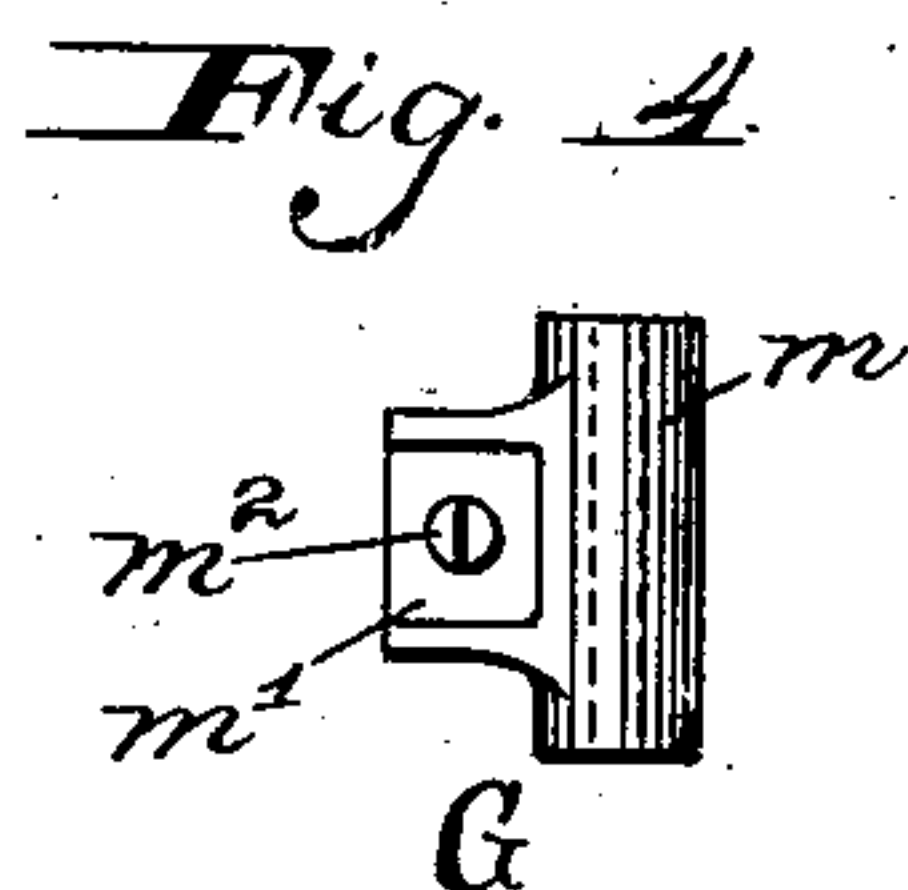
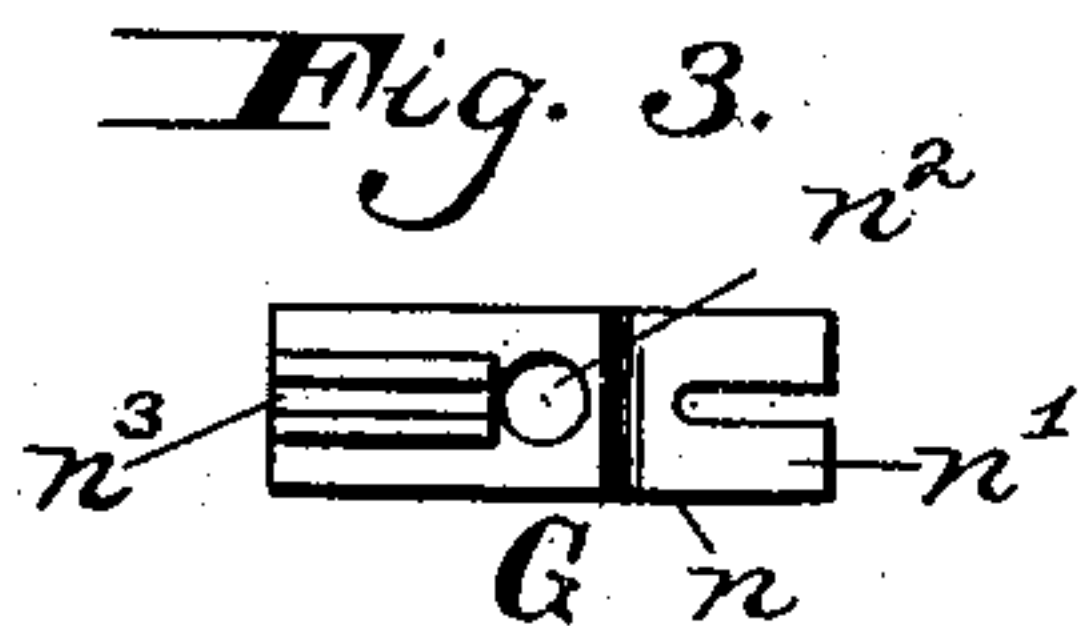
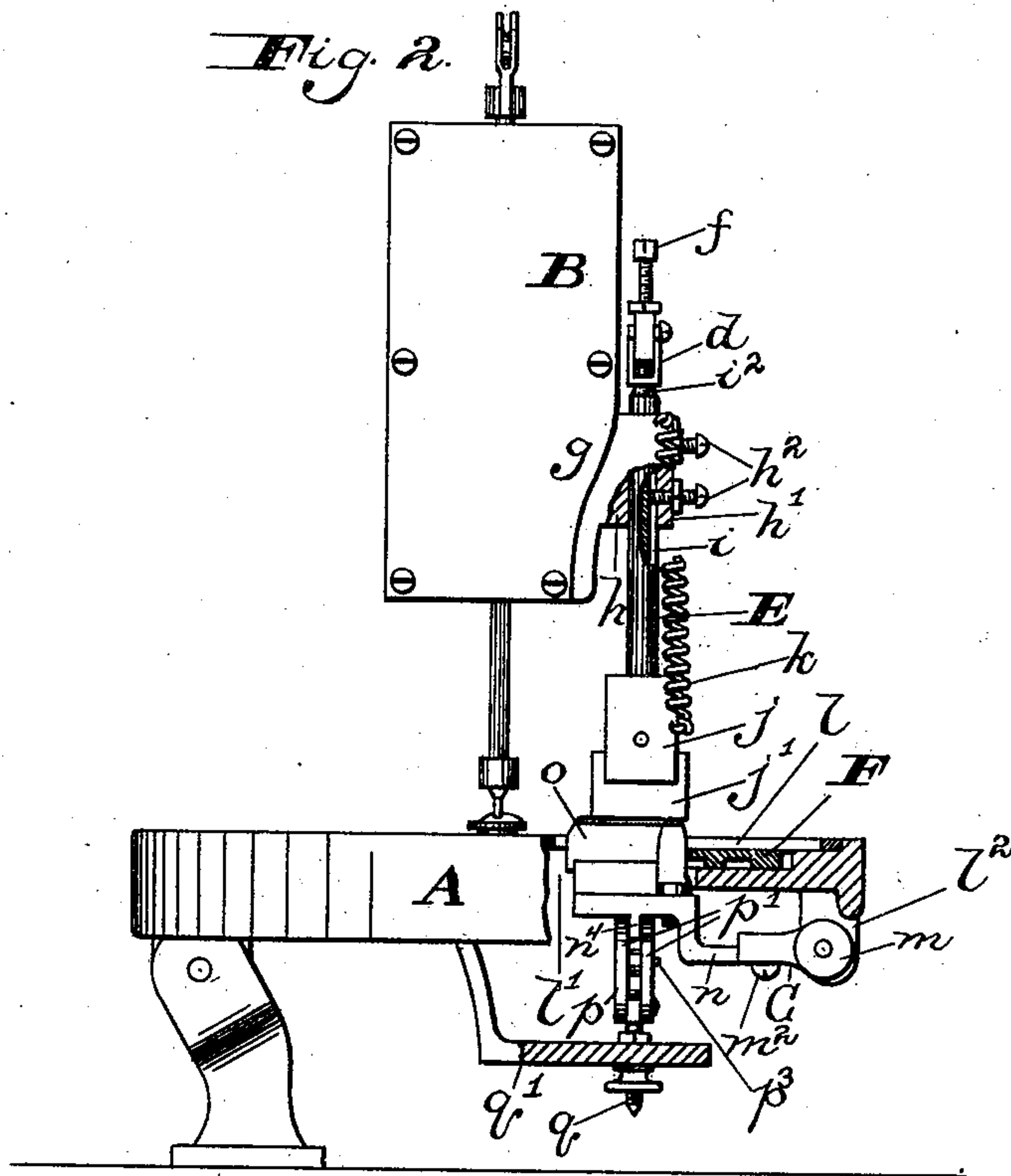
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POWER CUTTING ATTACHMENT FOR BUTTONHOLE SEWING MACHINES.

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(No Model.)

2 Sheets—Sheet 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

PHILIP FABISCH, OF BALTIMORE, MARYLAND.

POWER CUTTING ATTACHMENT FOR BUTTONHOLE-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 713,078, dated November 11, 1902.

Application filed October 21, 1901. Serial No. 79,397. (No model.)

to all whom it may concern:

Be it known that I, PHILIP FABISCH, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Power Cutting Attachments for Buttonhole-Sewing Machines, of which the following is a specification.

This invention relates to cutting attachments for buttonhole-sewing machines; and one of the objects of the invention is to provide a cutting attachment of this character which can be effectively actuated by power-operated means and which can readily be thrown by the operator into engagement with the power-operated means either before or after the buttonhole has been worked.

With this and other objects in view the invention consists in certain constructions, arrangements, and combinations of the parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a buttonhole-sewing machine provided with my improved cutting attachment, parts being broken away and in section to better illustrate the construction. Fig. 2 is an enlarged elevation of one end of the machine, showing parts in section on the line 2 2 of Fig. 1. Figs. 3 and 4 are detail views of the two sections of the adjustable knife-holder shown detached from each other. Fig. 5 is a detail view of the knife-holder with its knife in place. Fig. 6 is a detail view of the knife. Fig. 7 is a detail view illustrating the vertically-adjustable bearing for the eccentric which raises the knife-holder. Fig. 8 is a side elevation, with part in section, of the forward or free end of the presser-bar. Fig. 9 is an enlarged sectional view taken on the line 9 9 of Fig. 1. Fig. 10 is a detail view of the coupler-bar which temporarily connects the cutting mechanism with the power-operated means. Fig. 11 is a detail view of said coupler-bar, taken at right angles to Fig. 10. Fig. 12 is a detail view of an antifriction device for said coupler-bar. Figs. 13 and 14 are detail views of the cam-block that is secured to one end of said coupler-bar. Fig. 15 illustrates in detail the antifriction-roller that is carried on the lower

end of the coupler-bar and also illustrates the spindle of said roller, which spindle detachably secures the cam-block to the coupler-bar.

Referring to the drawings by reference-letters, A designates the bed-plate, and B the arm, of a buttonhole-sewing machine of the ordinary type, and C designates the table on which the machine is mounted.

Supported on the machine bed-plate A is a bracket-arm *a*, made rigid by braces which extend both in front and back of the machine-arm B, (only the brace *b* in front of said arm being shown,) and said bracket-arm extends upwardly and forwardly toward the forward end of the machine-arm and is provided at its upper end with a pivot-bearing *a'*. A presser-bar D is fulcrumed intermediate of its ends in said pivot-bearing and oscillates in a vertical plane, and pivotally secured to and depending from the rear end of said presser-bar is a link-rod *c*, provided at its lower end with a rocking foot *c'*. To the forward end of the presser-bar D is pivotally secured a wear-plate *d*, pressed upward by a spring *e* toward the lower face of the said bar and capable of being moved away from said face by means of an adjusting-screw *f* for the purpose of taking up the wear of the cutting-block, said screw working through the said lever and bearing against the said wear-plate, as shown best in Figs. 2 and 8.

Rigidly secured to that side of the needle-bar housing *g* adjacent the presser-bar D is a casing *h*, provided with a vertically-extending bore *h'*, into which feather-screws *h²* enter. A knife-block carrier in the form of a rod E is mounted to reciprocate vertically in said bore *h'* and is provided with a longitudinal groove *i*, which receives said feather-screws, and is also provided at its upper end with a socket or depression *i'*, in which an antifriction-ball *i²* loosely rests, said ball being in contact with the wear-plate *d* on the forward end of the presser-bar D, whereby when the said end of the bar is depressed the rod E will be pushed downwardly, and to the lower end of the rod E is rigidly secured a plate *j*, to which the knife-block *j'* is attached. A compression-spring *k* is secured to said plate *j* and to the casing *h* and tends to draw

the knife-block carrier upward when the pressure of the presser-bar D is removed therefrom.

The horizontally-rotated feed-wheel F of the machine, part of which is shown in section in Fig. 2, is provided with an opening l , which when it comes into registry with an opening l' in the bed-plate just underneath the knife-block j' permits the knife o to be raised into contact with the knife-block to cut the buttonhole. The knife-holder G for carrying the knife o is constructed in two adjustably-connected sections, as shown in Figs. 3 and 4—namely, first, a pivot-section m , mounted to swing in a vertical plane between two ears l^2 , formed on the front edge of the bed-plate A, and said section provided with a recessed socket m' , having a set-screw m^2 , and, second, a knife-carrying section n , provided with a slotted end n' , by which it is adjustably held in the socket m' , and also provided with an opening n^2 to receive the eye-shank o' and a longitudinal groove n^3 to receive the body o^2 of said knife.

As is well known by those versed in the art of buttonhole-sewing machines, different feed-wheels are employed in working different-sized buttonholes, and the knife-openings of the different feed-wheels are located at different distances from the margins of the feed-wheels. These conditions necessitate a change in the relative positions of different-sized knives, and to meet said conditions it has heretofore been necessary to entirely remove the knife-holder and replace it with a longer or shorter knife-holder and knife; but with the construction of adjustable knife-holder I have provided it is only necessary to lengthen or shorten the knife-holder without removing the same and to place in it a longer or shorter knife, as the occasion may require.

In order to lift the knife-holder G, I have provided an eccentric p , having a cam action on the under side of the knife-holder and pivoted on a vertically-adjustable screw q , mounted in a ledge q' , projecting from the bed-plate underneath the knife-holder, so that by means of said screw the eccentric may be adjusted vertically to take up wear. The said eccentric p is preferably provided with two flanges p' , adapted to take one on each side of a guide-flange n^4 on the lower side of the knife-holder section n , though said flanges are not necessary, and it is also provided with a transverse slot p^2 , in which a pin p^3 on one end of the eccentric-rod H works. The said eccentric-rod H is constructed in telescopic sections $p^4 p^5$, capable of yielding in a longitudinal direction by means of a spring p^6 , and at its end opposite the pin p^3 it is pivotally connected to one arm of a vertically-rocking bell-crank lever J, fulcrumed underneath the bed-plate A adjacent the link-rod c . The other arm of said lever is pivotally connected to the lower end of said link-rod.

In practice when the link-rod c is raised the eccentric-rod H will by means of the eccentric p raise the knife-holder and knife up through the opening in the bed-plate and feed-wheel and at the same time rock the presser-bar D, which moves the knife-block carrier E, with its knife-block j' , toward the knife. The proportion of parts is such that the knife will be raised to the upper limit of its movement while the knife-block is yet some distance from the knife; but the construction of the eccentric-rod H allows said rod to yield longitudinally until the link-rod c has been raised far enough to bring the knife-block with force against the knife, and thereby cut the buttonhole.

The power-operated mechanism for actuating the hereinbefore-described cutting attachment is illustrated on Sheet 1 of the accompanying drawings and will now be described. The table C is provided with a vertical opening c^2 , in which the rocking foot c' of the link-rod c is received. Rigidly secured to the table underneath said opening is an open frame K, in which the continuously-rotating power-shaft L is journaled. The said shaft is provided with a pulley P, connected by belt Q to the shaft R for driving the stitch-forming mechanism, and a cam-wheel M is secured on said shaft L and is provided on one side with a cam r . To that side of the frame K adjacent the cam r is secured a housing N, provided in one wall with a vertical slot r' , opening into the frame, and also provided in its opposite wall with an opening r^2 . Mounted to move up and down in said housing is a coupler-bar O, provided at its upper end with a socket s , which fits onto the rocking foot c' of the link-rod c . Said coupler-bar is provided at one side of its lower end with a cam-block s' and at the other side of said end with an antifriction-roller s^2 . A coil-spring s^3 , which is secured to said coupler-bar and to a pin w' in bell-crank lever w , tends to pull the coupler-bar downwardly, and a leaf-spring s^4 tends to press said coupler-bar laterally, so that the cam-block s' will protrude out through the opening r^2 in the housing N and at the same time hold the roller s^2 retracted from the vertical slot r' . A plate t , carrying an antifriction-roller t' , is secured in the top of the housing N, and the coupler-bar rides on this roller when it is moved up or down. A bell-crank lever u is fulcrumed on the lower end of the housing N, with one of its arms normally in engagement with the protruding cam-block s' . Another bell-crank lever w is fulcrumed on the frame K just underneath the lever u , with one of its arms in engagement with the other arm of the lever w , and a wire x is secured at one end to the other arm of the lever w , the other end of said wire being secured to a foot-treadle x' , whereby said wire may be drawn down to rock said lever. When the operator desires to cut the buttonhole either before or after the same has been worked, he

rocks the lever *w* by means of the foot-treadle, and said lever in turn rocks the other lever *u*, which presses the coupler-bar *O* laterally, so that its roller *s*² is moved through the slot *r*' into the path of the cam *r*. The said cam thereupon pushes the coupler-bar upwardly to effect the operation of the cutting attachment, and as the coupler-bar rises its cam-block *s*' rides along the interior of the housing-wall, thereby maintaining, with the assistance of the leaf-spring *s*⁴, the said bar in direct vertical alinement with the link-rod *c*. As soon as the cam *r* releases the roller *s*² the two springs *s*³ and *s*⁴ will draw the coupler-bar *O* downwardly and laterally, thereby moving the roller *s*² out of the path of the cam. The cam-block *s*' is detachably secured to the coupler-bar *O* by screw-threaded engagement with the spindle *y* of the roller *s*². The object of this construction is that said cam-block may be detached, so that the coupler-bar may be inserted in its housing *N*, and the cam-block is then inserted through the opening *r*² and attached to the coupler-bar. While the accompanying drawings illustrate one form of the invention, it is to be understood that changes in the details of construction may be made without departing from the scope of the invention as defined in the appended claims.

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

1. In a buttonhole-sewing machine, the combination of buttonhole-cutting mechanism; power-driving mechanism therefor; a coupler adapted to connect said cutting mechanism with the power mechanism, said coupler being movable in two directions, namely, laterally and longitudinally, and normally held out of engagement with said power mechanism; and means for moving said coupler in one direction into engagement with said power mechanism whereby the latter may move said coupler in the other direction to actuate the cutting mechanism, as set forth.

2. In a buttonhole-sewing machine, the combination of buttonhole-cutting mechanism; power-driving mechanism therefor which is normally disconnected therefrom; a laterally and longitudinally movable coupler connected to said cutting mechanism and spring-held out of engagement with said power mechanism; and means for moving said coupler laterally into engagement with said power mechanism whereby the latter may move said coupler longitudinally and actuate said cutting mechanism, as set forth.

3. In a buttonhole-sewing machine, the combination of the buttonhole-cutting mechanism; power mechanism for driving the same, and provided with a cam; a laterally and longitudinally movable coupler-bar having a rocking connection with the cutting mechanism and normally held out of the path of said cam; and means for moving said coupler-bar laterally into the path of said cam whereby

the latter may engage the coupler-bar and move it longitudinally to actuate the cutting mechanism, as set forth.

4. In a buttonhole-sewing machine, the combination of a cutting block and knife; means, including a reciprocating rod, for actuating said cutting block and knife; power-driving mechanism adapted to continuously operate; a movable coupler-bar having a rocking connection with said rod and normally held out of engagement with said power mechanism; means for moving said coupler-bar into engagement with said power mechanism, whereby to actuate said cutting mechanism; and means for automatically returning said coupler-bar to its normal position, as set forth.

5. In a buttonhole-sewing machine, the combination of buttonhole-cutting mechanism provided with an operating link-rod; a housing underneath said link-rod and provided in opposite walls with a vertical slot and an opening; a coupler-bar mounted to move in said housing and connected to said link-rod to move the same and provided with a cam-surface normally protruding out of the opening in one housing-wall; power-operated mechanism moving past the slot in the other housing-wall; and means for pressing said coupler-bar so that a portion thereof will project through the slot in the other housing-wall and be engaged by said cam to raise the coupler-bar, as set forth.

6. In a buttonhole-sewing machine, the combination of buttonhole-cutting mechanism provided with a vertically-movable operating link-rod; a housing underneath said link-rod and provided in opposite walls with a vertical slot and an opening; a coupler-bar movable up and down in said housing and connected to said link-rod to move the same and provided on one side with a cam-block and on its opposite side with an antifriction-roller; springs tending to move said coupler-bar downwardly and laterally so that the cam-block will protrude out of the opening in one housing-wall and the antifriction-roller will not project through the slot in the opposite housing-wall; power-operated mechanism moving past the said slot; and means for pressing said coupler-bar into the path of said power-operated mechanism, as set forth.

7. In a buttonhole-sewing machine, the combination of a cutting block and knife; means, including a reciprocating rod, for actuating said cutting block and knife, said rod being provided with a rocking foot; continuously-moving power-driving mechanism; a laterally and longitudinally movable coupler-bar connected with said rocking foot whereby to reciprocate said rod; and means for moving said coupler-bar laterally into engagement with the power-driving mechanism whereby the latter may move said coupler-bar longitudinally and reciprocate said rod, as set forth.

8. In a buttonhole-sewing machine, a cutting attachment comprising a vertically-mov-

able knife; a vertically-movable knife-block coacting with said knife; a presser-bar for moving the said knife-block; an eccentric for moving said knife; a longitudinally-movable eccentric-rod operatively connected to said eccentric; and a connection between said presser-bar and eccentric-rod for moving both of said parts.

9. In a buttonhole-sewing machine, a cutting attachment comprising a swinging knife-holder; a knife carried thereby; a reciprocating knife-block coacting with said knife; a presser-bar for moving said knife-block toward said knife; an eccentric for swinging said knife-holder toward said knife-block; a yielding eccentric-rod connected to said eccentric; and a connection between said presser-bar and eccentric-rod for moving both of said parts.

10. In a buttonhole-sewing machine, a cutting attachment comprising a swinging knife-holder; a knife carried thereby; a reciprocating knife-block coacting with said knife; a presser-bar for moving said knife-block toward said knife; an eccentric for swinging said knife-holder toward said knife-block; an eccentric-rod connected at one end to said eccentric and constructed in telescopic sections yielding longitudinally with respect to each other; a bell-crank lever having one arm connected to said eccentric-rod; and a link-rod connected to said presser-bar and also connected to the other arm of said bell-crank lever.

11. In a buttonhole-sewing machine, a cutting attachment comprising a knife-block; a knife-holder movable toward and from said knife-block; a knife carried by said knife-holder; an eccentric for moving said knife-holder; an adjustable bearing for said eccentric whereby the latter may be moved to take up wear; and means for moving said eccentric.

12. In a buttonhole-sewing machine, a cutting attachment comprising a knife-block; a knife; a knife-holder for said knife movable toward and from said knife-block, and adjustable in size whereby said holder may be used for different-sized knives; and means for moving said knife-holder.

13. In a buttonhole-sewing machine, a cutting attachment comprising a knife-block; a knife-holder for said knife and movable toward and from said knife-block, said knife-holder being constructed in sections adjustably connected together; a knife detachably held in one of said sections; and means for moving said knife-holder.

14. In a buttonhole-sewing machine, a cut-

ting attachment comprising a knife; a knife-block movable toward and from said knife; a reciprocating rod carrying said knife-block and provided in one end with an antifriction-ball; a presser-bar adapted to press on said ball to move said rod toward said knife; and means for moving said lever.

15. In a buttonhole-sewing machine, a cutting attachment comprising a knife; a knife-block movable toward and from said knife; a reciprocating rod carrying said knife-block; and a presser-bar for pressing said rod with its knife-block toward said knife and provided with a wear-plate adjustable toward and from said rod, substantially as set forth.

16. In a buttonhole-sewing machine, a cutting attachment comprising a swinging knife-holder; a knife carried thereby; a reciprocating knife-block coacting with said knife; a presser-bar for moving said knife-block toward said knife; and a rod, H, arranged to swing said knife-holder and connected with said presser-bar to move simultaneously therewith, said rod being yielding, as and for the purpose set forth.

17. In a buttonhole-sewing machine, a knife-holder provided with means whereby it may be adjusted for the knife-openings of different feed-wheels, and also provided with means to detachably hold a knife whereby different-sized knives may be secured thereto, as and for the purpose set forth.

18. In a buttonhole-sewing machine, the combination of a knife-block; a presser-bar for moving said knife-block; a knife; a rod for moving said knife; a link-rod connected to said presser-bar and to said first-named rod for simultaneously actuating said knife-block and knife; power mechanism adapted to continuously operate; and means, which the operator may employ either before or after the buttonhole has been stitched, for connecting said power mechanism with said link-rod.

19. In a buttonhole-sewing machine, the combination of buttonhole-cutting mechanism; power mechanism adapted to continuously operate; and means, which the operator may employ either before or after the buttonhole has been stitched, for connecting the said power mechanism with the cutting mechanism, said means including a lever arranged to be actuated by the foot of the operator, as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

PHILIP FABISCH.

Witnesses:

FREDERICK S. STITT,
CHARLES L. VIETSCH.