

(No Model.)

4 Sheets—Sheet 1.

G. REHFUSS.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 314,055.

Patented Mar. 17, 1885.

Fig 1

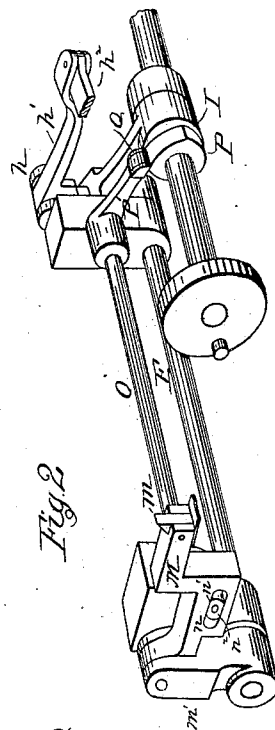
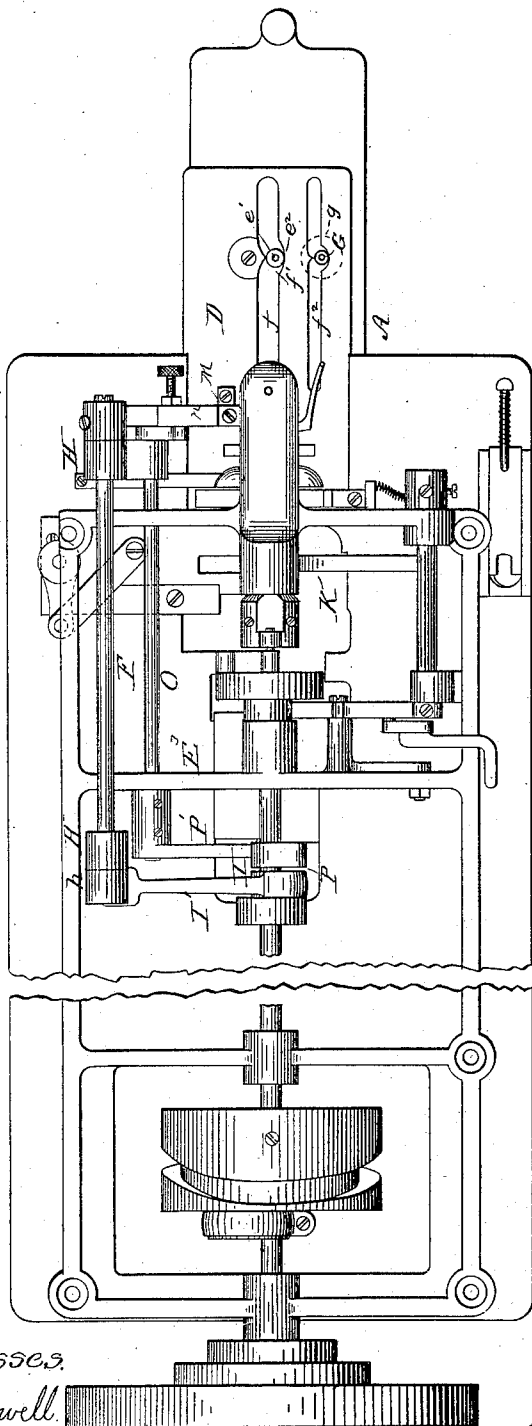


Fig 2

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Witnesses.

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By  
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(No Model.)

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Fig. 3.

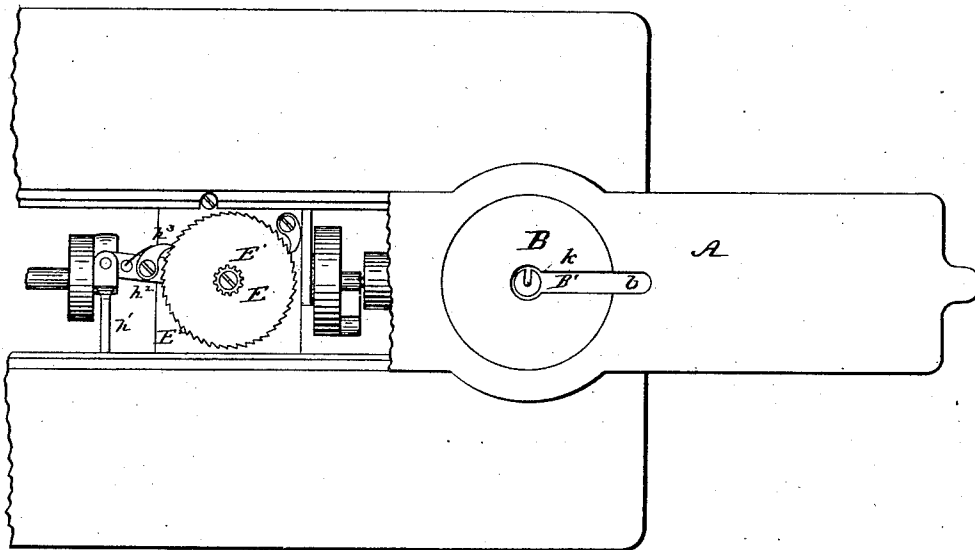
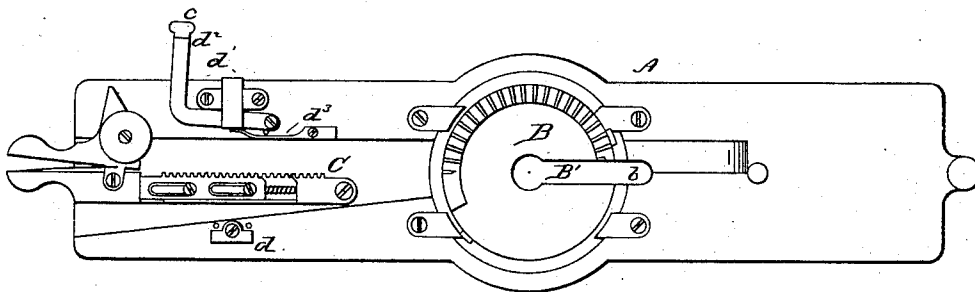


Fig 4



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Dos. P. Connally

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4 Sheets—Sheet 3.

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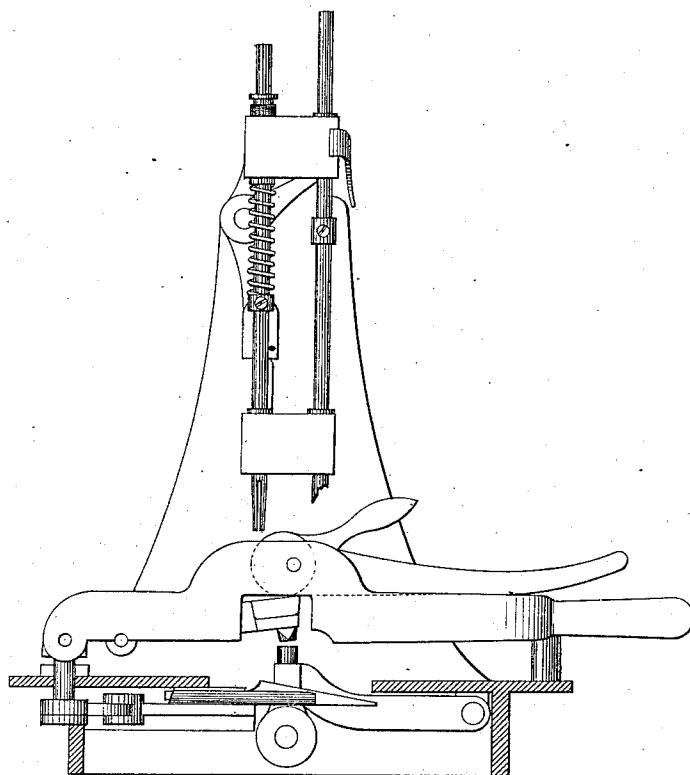


Fig. 5

WITNESSES

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*John C. Smith*

*George Rehfuß*

INVENTOR

*by Connolly Bros*

ATTORNEYS

(No Model.)

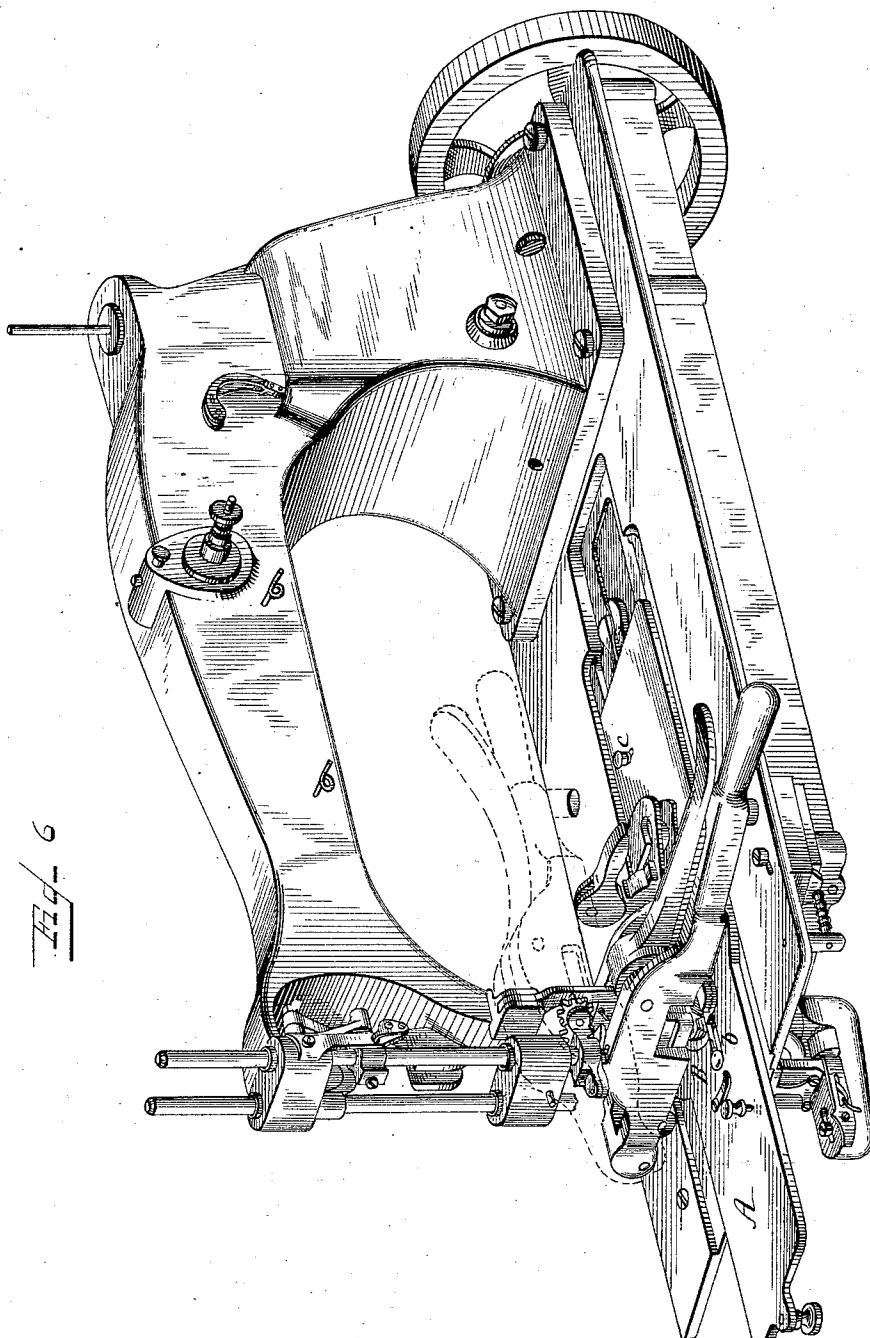
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G. REHFUSS.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 314,055.

Patented Mar. 17, 1885.



WITNESSES

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# UNITED STATES PATENT OFFICE.

GEORGE REHFUSS, OF PHILADELPHIA, PENNSYLVANIA.

## BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 314,055, dated March 17, 1885.

Application filed March 13, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE REHFUSS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Button-Hole Attachments for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a plan view of the under side of a Wheeler & Wilson sewing-machine having my improvements. Fig. 2 is a perspective view of a part of the mechanism embodying my improvements. Fig. 3 is a plan view dissected, showing the feed-plate and part of the mechanism for actuating the same. Fig. 4 is an under side view of the feed-plate. Fig. 5 is a transverse sectional view through the bed of a machine provided with a cutting attachment of the character to which the improvements hereinafter described are specially adapted. Fig. 6 is a perspective view of a sewing-machine embodying my improvements.

This invention has special relation to that class of button-hole sewing-machine attachments illustrated in the patent to Charles M. Banks, No. 286,989, dated October 23, 1883, which embodies the plan of a feed-plate carrying a swiveled disk, the former being moved lengthwise through the medium of a rack and pinion on its under side, and the disk rotated by means of a dog or pawl, which is attached to and moved by the four-motion feed of the sewing-machine, and engaging with a segmental rack formed on the lower surface of the disk.

The object of this invention is to increase the efficiency of the attachment by rendering its operations more accurate and serviceable, and adapting it to conditions for which other attachments of the same class are unsuited.

In the mechanism upon which the above-named patent is based the inventor has adopted and availed himself of the ordinary four-motion feed-bar to impart intermittent rotary motion to the swiveled disk, and, in keeping with the general plan and purpose of his improvements, has arranged the pinion, ratchet-

wheel, and other devices for moving the slide at a point immediately behind and in close proximity to the four-motion feed-bar. Now, it will be observed that in using the four-motion feed-bar for the purpose stated it is necessary to extend the arm or bracket which carries the disk-moving dog forward of the shuttle, whereby such arm is deprived of adequate support, and in some cases becomes unsteady and unreliable. And, again, the four-motion feed is not a positive action, but is partly controlled by a spring, which is uncertain and has a tendency to become inactive.

With reference to the feed plate or slide, it is to be noticed that in the Banks attachment, as well as in others of an analogous character, no provision is usually made for the adaptation or employment of a button-hole-cutting attachment, and that by reason of the peculiar arrangement of the slide-moving mechanism no serviceable slide-moving mechanism can be fitted to the machine.

My invention contemplates, first, the provision of means whereby a positive and reliable movement is imparted to the turning disk; and, secondly, the adaptation of the attachment to the employment of a button-hole-cutting device.

My invention accordingly consists (A) in the novel construction and arrangement of devices through which a positive and steady motion is communicated from the main shaft to the disk-actuating dog and to the gearing by which the feed-slide is propelled; (B) in the novel construction of the feed-slide and the parts belonging thereto, whereby the same may be adapted to the purposes and operation of the button-hole cutter.

The special form of button-hole-cutting attachment which has been found the most effective and reliable forms the subject of a separate application filed March 13, 1884, by E. B. Moore, Serial No. 124,101, and will accordingly only be incidentally referred to in this description.

Referring to the accompanying drawings, which illustrate my improvements applied to a sewing-machine of the Wheeler & Wilson type, A designates a feed-plate designed and adapted to fit in the opening in the cloth-plate usually occupied by the ordinary throat-plate. B designates the swiveled disk carried by said

feed-plate, the same being mounted substantially in the manner shown in the Banks patent referred to, and constructed with the button-hole slot B'.

- 5 Instead of having the slot B' terminate within the periphery of the disk, as in said patent, I extend said slot through said periphery to accommodate it to the cutting attachment, which requires an increased length of slot. A  
10 continuation of the slot is produced in the forward portion of the feed-slide, as shown at b, and with this extension the slot in the disk coincides when the disk is in its normal condition. The length of the slot B' b is about twice  
15 the length of the slot shown in the Banks patent.

- C designates a sectional rack fitted to the under side of the feed-plate, and constructed and arranged substantially as shown in the  
20 Banks patent, except that it is located at a greater distance from the disk, the distance being about the length of an ordinary button-hole, and that it is reversed with reference to the central line of the plate, for a purpose to  
25 be hereinafter described. It will be noticed that the feed-plate is somewhat longer than that shown in the Banks patent, and the purpose of this elongation is to adapt the slide to the peculiar movement which it obtains, in  
30 order to render the cutting attachment available. The plate A is provided with the yielding retainers d d', of which d is a pivotal block having its outer edge beveled to fit the corresponding edge of the cloth-plate, while d' is a  
35 dovetailed slide provided with an operating-lever extension, d'', against which impinges a spring, d'. A knob or thumb-piece, e, serves as a means through which the slide is manipulated.

- 40 D designates a slotted plate fastened to the bed of the machine by a screw, and corresponding to the plate F shown in the Banks patent. The feed-plate A carries a pin, e', upon which is mounted an anti-friction roller,  
45 e'', which fits and moves in the slot f, the latter being formed with the bend or cam diversion f'. The plate D has another and similar slot, f'', through which passes a screw, G, entering the feed-plate and carrying a spring-  
50 washer, g. The screw and washer, while holding the two plates together with a slight binding-pressure, permit the plate A to move upon the plate D with sufficient freedom to perform its offices. The slots f f'' are elongated a distance corresponding to the extra  
55 length given to the button-hole slot B' b, the extension being produced between the cam-like diversions and the inner end of the plate D.

- E represents a ratchet-wheel, with which is  
60 connected a pinion, E', mounted on a plate, E'', located over the transverse brace E'' of the machine-bed. The pinion is adapted to engage with the sectional rack C. Motion is communicated to the ratchet E from a rock-  
65 shaft, F, which is supplementary to the usual appendages of a Wheeler & Wilson sewing-machine, and which is mounted in special

bearings H H', located at one side of and at a distance from the main shaft of the machine. This rock-shaft carries at its rear end  
70 a crank-arm, h, to which, at the upper end, is coupled a link, h', pivotally connected with a lever, h'', the latter fulcrumed on the shaft or spindle of the ratchet-wheel E, and carrying a spring pawl or dog, h'', which engages with  
75 said ratchet-wheel E and intermittently rotates the same. The shaft F is connected with an eccentric, I, on the main shaft by means of a pitman, I', swiveled or pivoted to the crank-arm h, and is rocked thereby. As the main  
80 shaft rotates continuously in one direction, the ratchet-wheel and pinion are intermittently moved and the feed-plate propelled, while the sectional rack is in position to convey motion to said feed-plate.

In the Banks patent, before referred to, the relative positions of the rack and pinion are such that the feed is toward the back of the machine. Under this arrangement and mode  
90 of feeding the travel of the feed-plate is limited to the length of the button-hole, and cannot be exceeded; but in my attachment the requirements of the cutting mechanism are such that the feed-slide must be capable of movement a distance at least twice the length of  
95 the button-hole. A portion of this movement is obtained independently of the feeding mechanism. To provide for such an extraordinary movement of the feed-plate, I have reversed the movement of the feed, and now cause the  
100 feed-plate, under the stitching operation, to travel toward the operator.

In adjusting the feed-slide preparatory to stitching a button-hole, the middle portion of the slot B' b is brought under the needle. Any  
105 other adjustment may be made, according to the size of the button-hole to be stitched. The position of the cloth-clamp is the same as in the Banks patent, referred to heretofore.

Before the button-hole has been stitched,  
110 and when it is desired to cut the button-hole, the rack is disengaged from the pinion and the feed-slide pushed back by hand until the outer end of the slot b strikes the nipple k. This movement brings that part of the cloth in  
115 which it is desired to cut the slit directly over the anvil K, which is located, as shown, between the nipple and the pinion which engages with and moves the sectional rack occupying the space which in the Banks patent,  
120 referred to, is filled with or contains certain portions of the slide-moving mechanism. The character of this mechanism I have materially changed, in order to make room for this anvil and its appurtenances, as well as to ac-  
125 complish other objects, which appear from the description already given. The swiveled disk is turned by means of a ratchet or dog, m, carried by a four-motion lever, M, which, instead of being connected to the four-motion  
130 feed-bar of the sewing-machine, is pivotally connected to a crank-arm, m', mounted on the outer end of the rock-shaft. Through the motion of this shaft, obtained from the main shaft

in the manner described, the lever *m* is reciprocated in one direction. A slot, *n*, is formed in said lever, and in said slot plays a slide, *n'*, carried on a crank-pin, *n''*, the crank being on the end of the horizontal shaft *O*, which shaft has its bearings in the frame-work of the machine, as shown, and is adapted to rock, and thereby impart to the lever *M* a vertical movement. These two movements of the lever are similar to the four motions of the feed-bar, and are the movements through which the disk is rotated in the same way and for the same purposes as in the Banks patent. The rocking motion of the shaft *O* is produced by means of a cam, *P*, on the main shaft, and a crank-arm, *P'*, which is mounted on the rear end of the shaft *O* and carries an anti-friction roller, *Q*, which rides on the periphery of said cam.

What I claim as my invention is as follows:

1. In button-hole appliances for sewing-machines, the combination, with a feed-plate carrying a rotary disk, and having a sectional rack on its under side engaging with a pinion through which motion is conveyed from the main shaft, and said plate caused to travel outwardly on a line with the needle-arm, or toward the front of the machine, and the disk

caused to revolve, of a button-hole cutter and an anvil or die, said anvil or die and cutter being located between the throat and the stand-ard supporting the needle-arm, and said disk and feed-slide being formed with communicating slots, whereby a shifting movement of the slide is permitted, to allow the cutter and anvil play through the same, substantially as described.

2. In button-hole appliances for sewing-machines, the combination of the following elements, viz: a feed-plate carrying a rotary disk and having a sectional rack mounted on its under side, a rock-shaft having a crank-arm on one end coupled to the main shaft and receiving motion therefrom, a pinion, ratchet-wheel, and pawl and lever mounted on the bed of the machine, and a link connecting the pawl-lever with the crank-arm, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day March, 1884.

GEO. REHFUSS.

Witnesses:

THOS. A. CONNOLLY,  
FRANCIS S. BROWN.