

(No Model.)

2 Sheets—Sheet 1.

J. BOYNTON.
BUTTON HOLE SEWING MACHINE.

No. 390,063.

Patented Sept. 25, 1888.

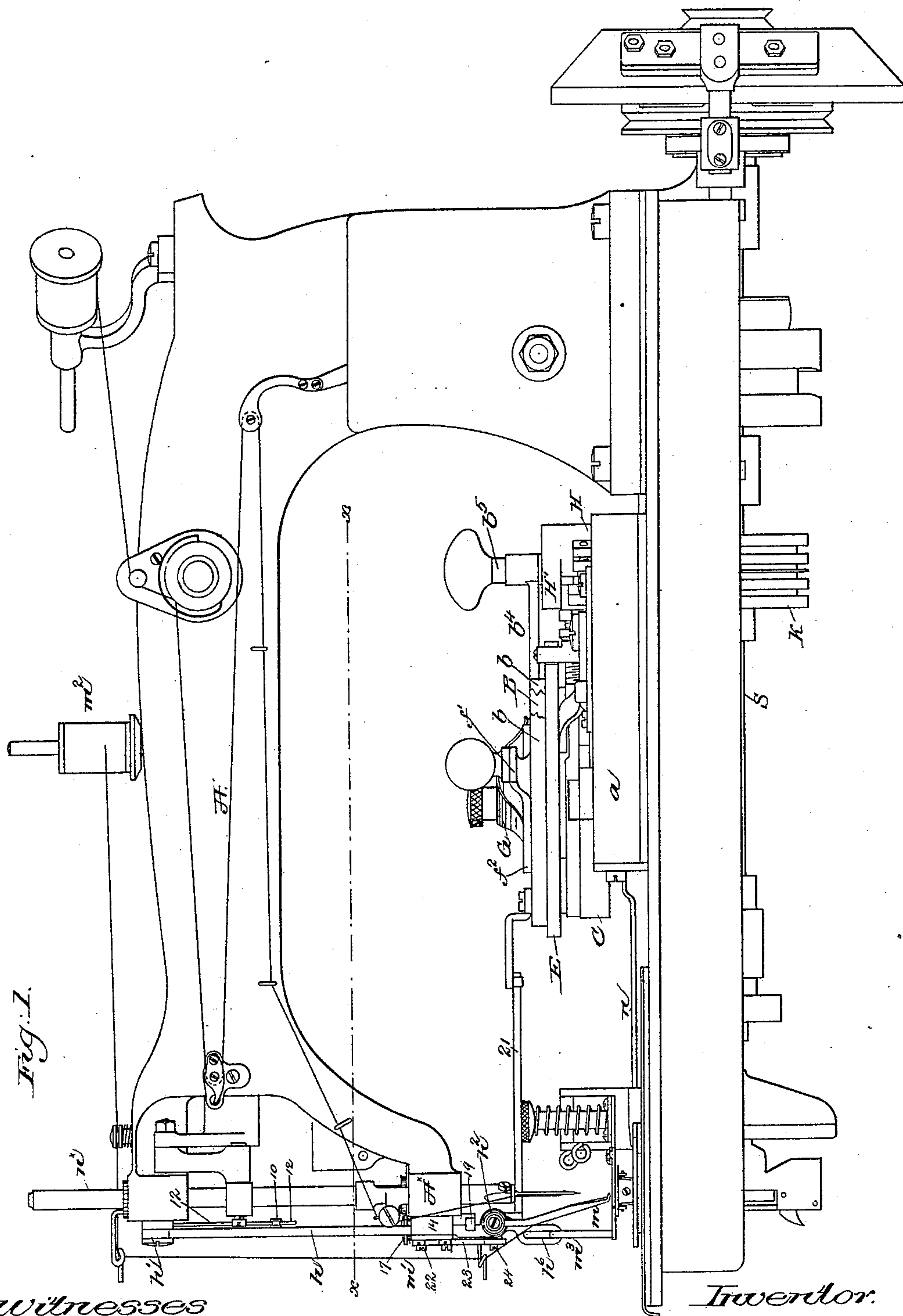


Fig. 1.

witnesses
Fred L. Emery
John F. C. Pinkert

Inventor.
John Boynton.
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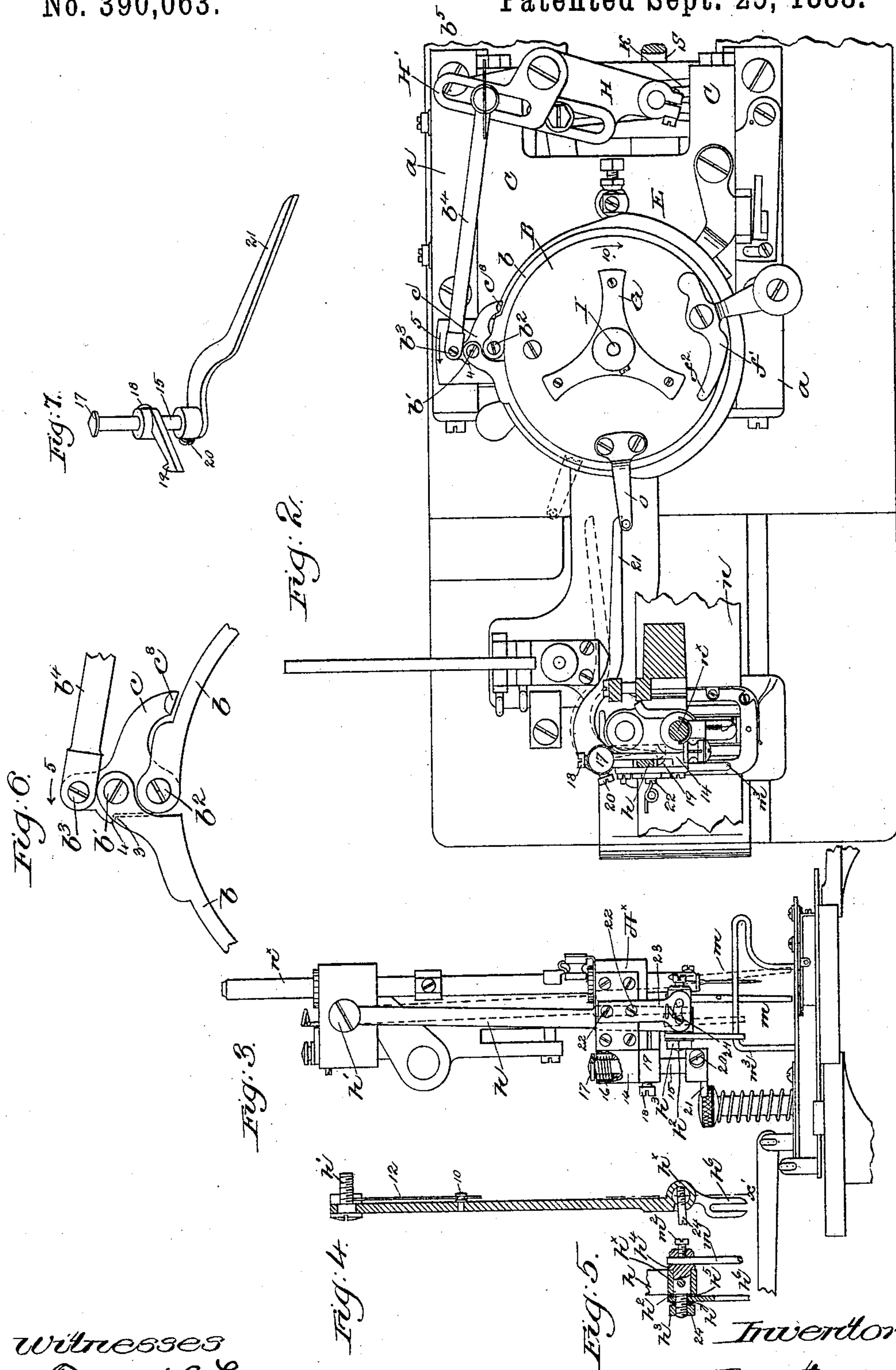
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Witnesses
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John F. C. Perinckert

Inventor:
John Boynton,
by Leroy Gregory attys

UNITED STATES PATENT OFFICE.

JOHN BOYNTON, OF BRIDGEPORT, CONNECTICUT.

BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 390,063, dated September 25, 1888.

Application filed January 5, 1887. Serial No. 223,448. (No model.)

To all whom it may concern:

Be it known that I, JOHN BOYNTON, of Bridgeport, county of Fairfield, and State of Connecticut, have invented an Improvement in
5 Button-Hole Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is intended to be an improvement upon that represented in United States Letters Patent No. 303,453, the object being
10 to more positively insure the placing of the cord under the needle-thread.

In the patent referred to the cord-guide had
15 a nearly semicircular movement, it being attached to an arm which had the needle-bar as its center of oscillation; but herein the cord-guide is attached to a horizontal rock-shaft mounted in a bearing at the lower end of a
20 carrier, (shown as a lever,) which is free to move and place the cord-guide at opposite sides of the needle, as provided for in the said patent. The rock-shaft referred to has an arm which is in engagement with the cloth-
25 clamp, or it may be with some other moving part of the machine capable of vibrating the said arm in unison with the lateral movement of the cloth-clamp, the connection of the said arm with the said rock-shaft preferably being
30 by friction, especially when the cloth clamp is made the motor for the rock-shaft, the frictional attachment of the arm and shaft enabling the cord-guide to be kept in proper position in the throw of the clamp, as when the
35 over stitching is narrower or wider. The carrier for the rock-shaft of the corder is held in such position as to enable the cord to be correctly laid under the stitching along one side of the button-hole, and one side having been
40 stitched, the said carrier is automatically released by mechanism co-operating with the actuating devices for the cloth-clamp, so that, one side of the button-hole having been stitched, the said cord-guide is quickly thrown
45 to the opposite side of the needle, so that in its further vibrations the cord carried by the said cord-guide will be laid under the stitching for the opposite side of the button-hole.

I have provided the rock-shaft referred to
50 with a stud to co-operate with a guide to positively insure the passage of the end of the

cord-guide about the path of movement of the needle, such device not, however, being essentially necessary, for the release of the carrier is effected when the needle is above the ma-
55 terial, and the cord-guide will arrive in its position at the opposite side of the needle before the needle descends.

My invention consists, essentially, in the combination, with a needle-bar, cloth-clamp, 6c and a carrier and rock-shaft having a cord-guide, of means for oscillating the said rock-shaft to vibrate the cord-carrier, whereby the cord is laid under the stitching forming each side of a button-hole. The feeding wheel or
65 disk which imparts movements to the cloth-clamp is moved intermittently by means of a circular strap connected at or near its ends in such manner with a lever that the said lever when vibrated in one direction will be con-
70 tracted to grasp the disk or wheel, and when moved in the opposite direction will be expanded to release the said disk or wheel, the strap remaining released while it is being
75 moved in a direction opposite that in which the disk or wheel is to be moved, the backward movement of the strap being to enable it to take a new hold upon the disk or wheel preparatory to again turning it forward.

Figure 1, in side elevation, represents a suf- 8c
ficient portion of a Wheeler & Wilson sewing-machine for stitching button-holes to enable my invention to be understood. Fig. 2 is a plan view of the feeding mechanism and the devices at the left of it below the dotted line
85 $x x$. Fig. 3 is a front elevation of only the left-hand end of Fig. 1, the rotating loop taker or hook being omitted. Fig. 4 is a vertical section taken longitudinally through the carrier. Fig. 5 is a section of Fig. 4 in the dot-
90 ted line $x' x'$. Fig. 6 is a detail view of part of the encircling strap and connecting parts for intermittently grasping and moving and then releasing the hub of the wheel to be rotated by it; and Fig. 7 shows separately a catch,
95 19, to be referred to.

The guides a , the carriage C therein, the cam-wheel E, the post I, spring G, the mechanism intermediate the cam E and carriage C, the lever H', the switch-cam K, and main shaft 1c0
S are all substantially such as shown in United States Patent No. 303,557, where like parts

are designated by like letters; so the said parts need not be herein further described.

In the Patent No. 303,557 the feeding disk or wheel at the upper side of the cam E is shown as provided with ratchet-teeth; but herein the feeding disk or wheel (marked B) has a smooth periphery and is encircled by a preferably metallic strap, *b*, which is contracted and expanded to grasp and release the periphery of the said feeding disk or wheel at the proper times by a strap-lever, *c*. This strap-lever is pivoted to one end of the strap *b* by a pivot, *b'*, and to the other end of the said strap by a pivot, *b''*, and the said strap-lever has jointed to it by a pivot, *b'''*, one end of a link, *b''''*, which in turn is adjustably connected by suitable bolt and screw, *b'''''*, to one end of the vibrating lever H H', the vibrations of the lever in one direction, as toward the right in Fig. 2, by the switch-cam K, causing the strap-lever to be turned in such direction as to compel the strap *b* to hug closely the periphery of the disk or wheel B and cause the said wheel to be rotated in the direction of the arrow 10 in Fig. 2, the reverse vibration of the said lever H H' causing the strap-lever to be turned in such direction as to expand the strap *b*, so that it no longer hugs the wheel or disk B, and in the further movement of the lever H H' in the same direction, after the strap B has been expanded, the said strap is pushed bodily about the disk or wheel B opposite the direction of the arrow in Fig. 2, the rotation of the wheel or disk B being at such time checked by the spring G.

The strap and strap-lever constitute a friction-clutch by which the intermediate rotation of the disk or wheel B may be made for any desired distance, thus avoiding the use of a ratchet-wheel and pawl, as in the patents referred to.

It will be observed that the strap-lever *c* is of a peculiar form, so that the pivot by which the link *b''''* is attached thereto and the pivots by which the said lever is connected with the strap *b* are all in a line with each other, or approximately so. This form of the said lever and the arrangement of the said pivots secure a compact and efficiently-operating mechanism specially well adapted for the purpose intended.

That end of the strap *b* which receives the pivot *b'* is provided, as herein shown, with a saw-cut to receive in it the heel 4 (see Fig. 6) of the strap-lever, the shape of the said saw-cut being such as to leave a shoulder, 3, against which may act the said heel when the said strap-lever is moved in the direction of the arrow 5 to effect the release of the strap from the wheel B. This shoulder and heel obviate undue or excessive expansion of the strap *b*. The inner end of the lever *c* has a toe, *c''*, the said toe being provided in order that the strap-lever may be expanded independently of the movement of the lever H H' whenever it is desired to turn the wheels B and E backward in a direction opposite the arrow 10.

The feed-wheel B, as herein shown, has pivoted upon it a hand-lever, *f'*, provided with a toe, *f''*, which, by turning the hand-lever when the said toe is opposite the toe *c''* of the strap-lever *c*, will cause the strap-lever to be turned in the direction of the arrow 5, as stated, so as to expand the strap *b* and leave the wheel B free to be turned backward by hand, and so also by or through the said hand-lever the feed-wheel may be rotated in its forward direction whenever desired independently of the strap *b*. The carrier *h*, pivoted on the screw *h'*, is provided at its lower end with a cylindrical bearing, *h''*, (see Fig. 5,) in which is fitted a short rock-shaft, *h'''*, screw-threaded at one end to receive a nut, *h''''*, by which a shoulder, *h'''''*, near the opposite end of the rock-shaft may be brought up to the said bearing. The rock-shaft *h'''* at that end of it upon which the nut is applied is provided with a shoulder, (see Fig. 5,) against which is placed a washer, *h''''''*, and thereafter there is applied to the said rock-shaft an arm, *h''''''''*, and a small spring, *h'''''''''*, and finally the nut *h''''*, the latter acting against the said spring, so that the arm *h''''''''* is held frictionally upon the said rock-shaft.

The head of the rock-shaft is bored to receive the shank of the cord-guide *m*, made as a rod having suitable eyes for the passage of the cord *m'*, which in practice will be led from a suitable spool, *m''*, through suitable guides to the lower end of the cord-guide *m*, the cord passing from the lower end of the cord-guide direct to the work at or near the stitching-point. The cord-guide *m* is held adjustably in the rock-shaft *h'''* by a set-screw, *m''*.

The arm *h''''''''* (see Figs. 1 and 4) is bifurcated, and embraces, as herein shown, a projection, *m'''*, extended vertically from the upper member of the cloth-clamp, which cloth-clamp is of regular construction and not of my invention, and so need not be herein further described, except to say that the said clamp is connected with a cross-bar of the feeding mechanism, as is the member marked *t* in the Patent No. 303,557, referred to, so that the said clamp has imparted to it a movement to carry the cloth not only longitudinally backward and forward in the direction of the button-hole under the needle, but also laterally, so that the over-stitching is made of the proper width to constitute the sides of the button hole.

The carrier *h* is provided at its rear side with a pin, 10, against which acts a suitable spring, 12, which has its upper end fixed with relation to the head of the machine, the said spring normally acting to press the carrier to its farthest position to the right in Fig. 3 or toward the operator, that being the position of the carrier while the material being stitched is being moved away from the operator, or while the left-hand side of the button-hole is being stitched.

The lowermost bearing, *A''*, at the front end of the overhanging arm A has fixed to it a suitable bearing, 14, in which is loosely placed a stud, 15, the upper end of which is sur-

rounded by a spiral spring, 16, which is in-
closed in a chamber made for it in the upper
portion of the bearing, one end of the said
spring being fixed to the bearing, while the
5 other end of the spring is fixed to the head
17 of the said stud, the said spring normally
acting to turn the stud to the right. This
stud 15 has connected to it by a set-screw, 18,
a catch, 19, (shown separately in Fig. 7,) which
10 engages the carrier *h* and holds it while the
right-hand side of the button-hole is being
stitched, or while the material is being moved
toward the operator or in the position shown
by full lines, Fig. 3, the dotted-line posi-
15 tion of the carrier in Fig. 3 being that which
it occupies when the catch has released the
carrier and the spring is effective. The stud
15 has also attached to it by a screw, 20, a
trip-lever, 21, which, at the completion of the
20 first side of the button-hole and while the end
of the button-hole opposite where the stitch-
ing is commenced is being stitched, is acted
upon by the projection *o*, attached to the
wheel B, to effect the withdrawal of the catch
25 19 from the carrier *h*, so that the cord-guide
can immediately pass to the opposite side of
the needle, so that the cord delivered from the
cord-guide may be held along the slit and con-
stitute the other side of the button-hole while
30 the cloth-clamp is being moved backward
into its starting position.

The block constituting the bearing 14 is, as
herein shown, of such shape as to extend across
the bearing *A*^x, in which the needle-bar *n*^x re-
ciprocates, the said extension being slotted, as
35 best shown in Fig. 2 and by dotted lines, Fig.
3, to receive the carrier *h*, the width of the car-
rier being sufficiently less than the length of
the slot to permit the carrier to have the re-
quisite amount of play in order to enable the
40 cord-guide to pass from one to the opposite
side of the needle when the motion of the cloth-
clamp is to be reversed in going from one to
the other side of the button-hole.

45 The extension of the guide 14 has, as herein
shown, attached to it by screws 22 a bar, 23,
provided at its lower end with a cam-slot, into
which enters a pin, 24, extended from the
rock-shaft *h*², the said pin passing through a
50 slot in the bearing at the lower end of the car-
rier *h*, the said cam-slot being of such shape as
to positively insure a slight rocking motion to
the rock-shaft *h*² when the cord-guide is shifted
from one to the opposite side of the needle, in
55 order that the lower end of the cord-guide
may pass about and not touch the needle or
the needle-thread extended from the eye of the
needle to the material.

60 Instead of operating the rock-shaft from the
projection *m*³, attached to the cloth-clamp, it
is obvious that the said rock-shaft might de-
rive its motion from some other parts of the
machine—as, for instance, the arm *h*⁶ might be
connected by a link with the end of the lever
65 *H*¹; but the construction shown is preferred,
this modification being mentioned as showing
that my invention is not necessarily limited

to the exact devices for imparting motion to
the rock-shaft and cord-guide in unison with
the lateral movements of the cloth-clamp. 70

The arm *h*⁶ is frictionally attached to the
rock-shaft, so that when the lateral throw of
the cloth-clamp is increased or diminished the
relative positions of the cord-guide and arm *h*⁶
may be readily changed with relation to the 75
rock-shaft, in order that the lower end of the
cord-guide may correctly present its cord un-
der the needle-thread.

I am aware that a cast-metal friction-band
has been constructed and cast integral with 80
either the fast or loose pulley of a friction-
clutch, as in the patent to Bean, No. 321,941,
and such construction, or any part of such
construction, I disclaim entirely.

I claim— 85

1. In a machine for stitching button-holes,
a cloth-clamp, the disk or wheel E for operat-
ing and the attached wheel B for controlling
the time of movement of the said clamp, the
wheel B having a smooth periphery and an 90
independent encircling metal strap, *b*, having
the shoulder 3, a strap-lever pivotally con-
nected with the two ends of the said strap and
having a heel, 4, and an operating device con-
sisting of the link *b*⁴, pivoted to said lever, the 95
pivots by which said device is connected with
the said lever and the pivots by which the
latter is connected with said strap being all
in a line with each other, combined with means
for actuating said operating device, substan- 100
tially as described.

2. In a machine for stitching button-holes,
a cloth-clamp, a feed disk or wheel, B, hav-
ing a smooth periphery, its encircling strap
b, a strap-lever pivoted to the ends of the 105
said strap, and having a toe or projection,
combined with an independent lever to act
upon the toe of the strap-lever to effect the
expansion of the strap when it is desired to
move the said wheel or disk by hand inde- 110
pendently of the regular mechanism for act-
uating it, substantially as described.

3. In a machine for stitching button-holes,
the following instrumentalities, viz: a needle-
bar and needle, a cloth-clamp, the carrier *h*, 115
made movable in the direction of the feed of
the cloth, a rock-shaft carried by it and hav-
ing an attached cord-guide, *m*, and means for
oscillating the said rock-shaft to vibrate the
cord-carrier in unison with the cloth-clamp 120
at right angles to the edge of the button-hole,
whereby the cord is laid under the stitching
forming each side of a button-hole, substan-
tially as described.

4. The movable carrier *h*, provided at its 125
lower end with a bearing, a rock-shaft located
in the said bearing, and provided with a cord-
guide and with an arm, *h*⁶, combined with a
part of the machine moved in unison with the
cloth-clamp, substantially as described. 130

5. The movable carrier *h*, provided at its
lower end with a bearing, a rock-shaft located
in the said bearing, and provided with a cord-
guide and with a pin, 24, combined with a

guide having a cam-slot entered by the said pin, substantially as described.

6. The movable carrier *h*, provided at its lower end with a bearing, a rock-shaft located
5 in the said bearing and provided with a cord-guide and with a rock-shaft having a catch to hold the said carrier, and a trip-lever, to operate substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

• JOHN BOYNTON.

Witnesses:

ISAAC HOLDEN,
LOUIS H. BAKER.