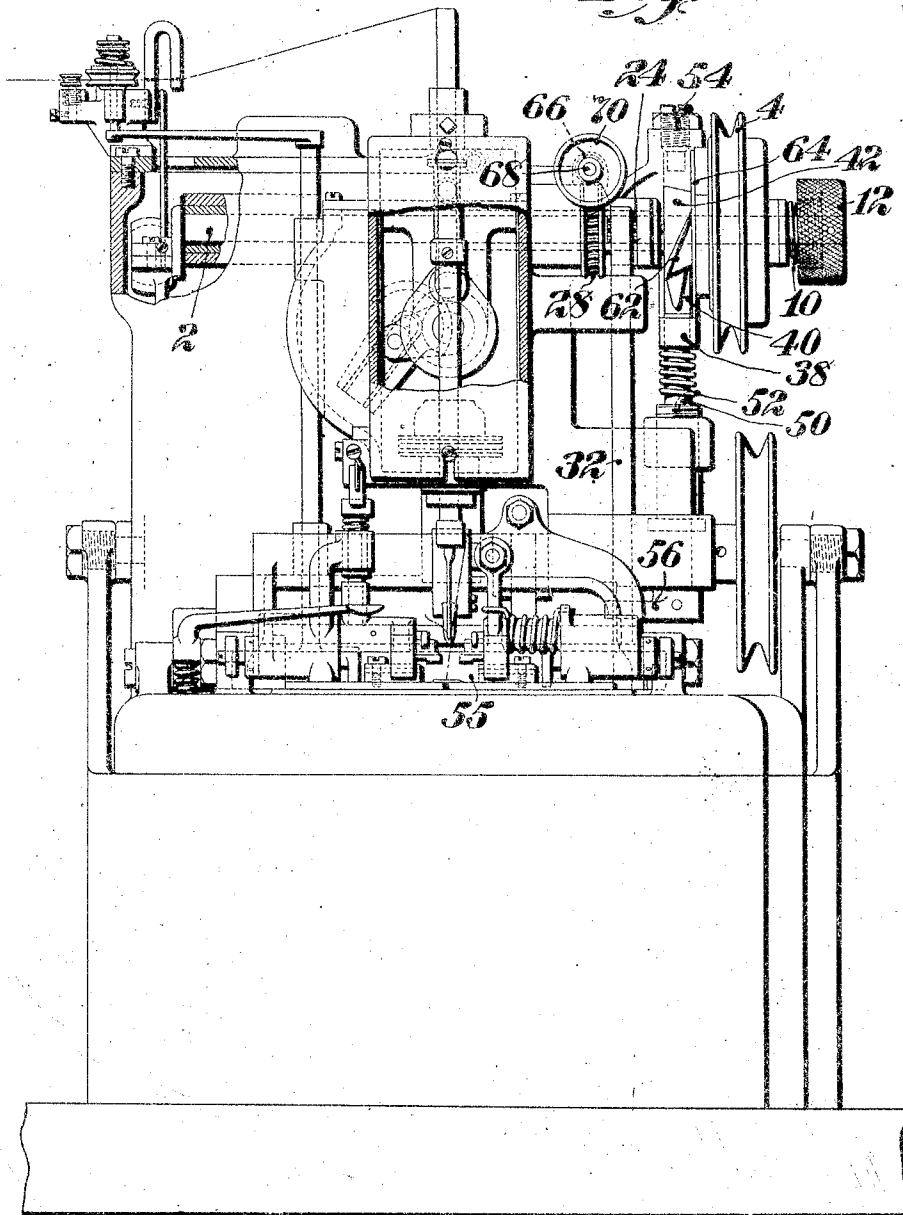


G. S. HILL.
STOPPING MECHANISM.
APPLICATION FILED MAR. 18, 1916.

1,212,486.

Patented Jan. 16, 1917.
2 SHEETS—SHEET 1.

Fig. 1.



Witness:

Merton W. Willmore

Inventor:

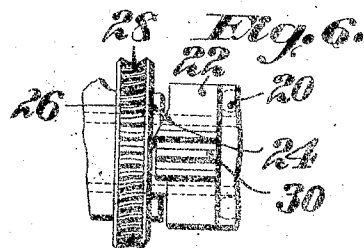
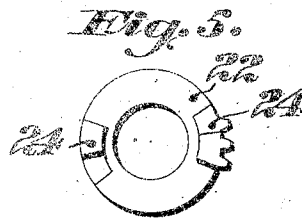
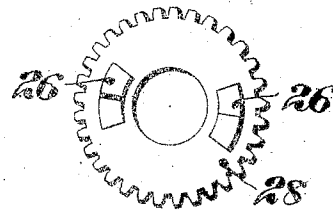
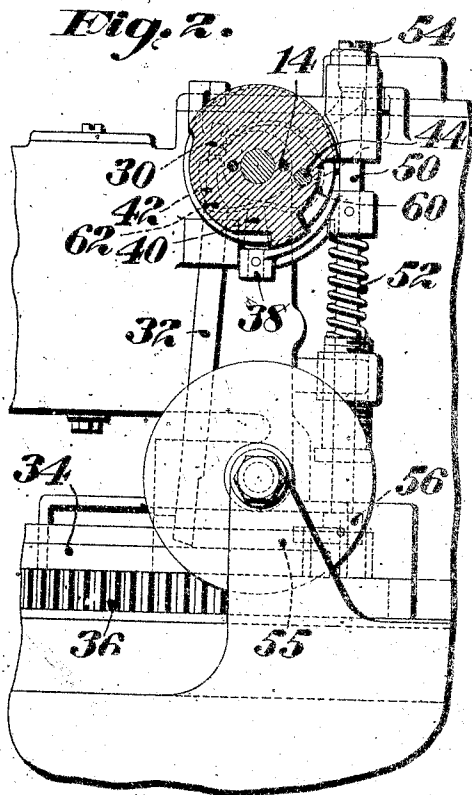
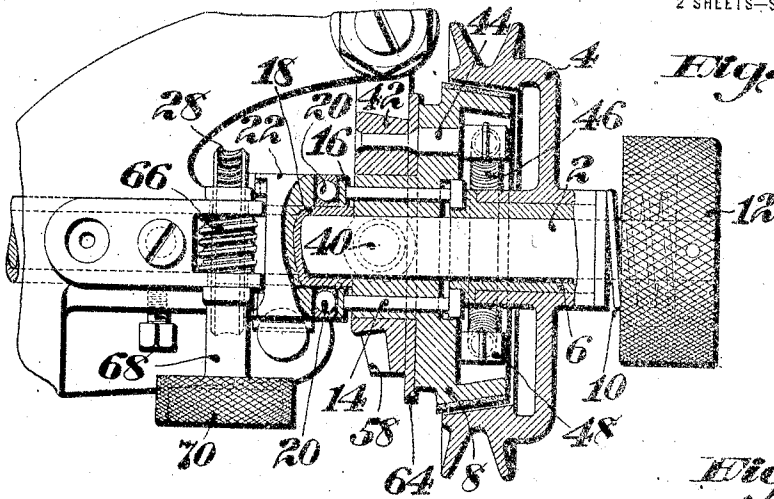
George S. Hill
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Witness:

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UNITED STATES PATENT OFFICE.

GEORGE S. HILL, OF STRAFFORD, NEW HAMPSHIRE, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

STOPPING MECHANISM.

1,212,486.

Specification of Letters Patent.

Patented Jan. 16, 1917.

Original application filed April 27, 1914, Serial No. 834,720. Divided and this application filed March 18, 1916. Serial No. 85,135.

To all whom it may concern:

Be it known that I, GEORGE S. HILL, a citizen of the United States, residing at Strafford, in the county of Strafford and State of New Hampshire, have invented certain new and useful Improvements in Stopping Mechanisms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to stopping mechanism for buttonhole sewing or other machines in which the machine or some mechanism of the machine is to be stopped in predetermined position.

The present application is a division of the co-pending application of applicant, Serial No. 834,720, filed April 27, 1914, for improvements in stopping mechanism.

The object of the invention is to provide novel and improved means by which the operator may readily and conveniently adjust the stopping mechanism in accordance with the speed of the machine.

To this end the invention consists in the features of construction and combinations of parts hereinafter described and referred to in the claims.

The features of the invention will be readily understood from an inspection of the accompanying drawings, and the following detailed description of the mechanism illustrated therein.

In the drawings, Figure 1 is a front elevation showing so much of a buttonhole sewing machine as is necessary to illustrate the application of the invention thereto; Fig. 2 is a detail sectional view showing the parts in stopping position; Fig. 3 is a sectional plan view of the driving and stopping mechanism; and Figs. 4, 5 and 6 are details of the devices for engaging and disengaging the driving clutch.

In the drawings the invention is shown embodied in a buttonhole sewing machine having the general construction and mode of operation of the machine shown and described in Patent No. 1,063,880, June 3, 1913. In this machine the stitch forming mechanism and the mechanism for feeding the work clamp are driven during the sewing of the buttonhole from a driving shaft 2. The mechanism for driving and stopping

the shaft comprises a continuously rotating driving pulley 4 which is loosely mounted on a sleeve 6 surrounding the shaft. The pulley is provided with an internal clutch face adapted to cooperate with a clutch disk 8 which is fast to the shaft. The pulley is forced in a direction to engage the clutch members by a spring 10 interposed between the end of the sleeve 6 and a knurled head 12 secured to the end of the shaft. The pulley is moved against the tension of the spring to disengage the clutch members through pins 14 which pass through the hub of the clutch disk 8 and are interposed between the end of the sleeve 6 and a bearing plate 16 which loosely surrounds a sleeve 18. A ball bearing 20 is interposed between the disk 16 and the end of a clutch actuating sleeve 22 which is mounted to turn loosely on the sleeve 18. The sleeve 22 is provided with two cam segments 24 arranged to cooperate with cam segments 26 formed on a stationary disk 28 in moving the driving pulley against the tension of the spring 10 to disengage the clutch members, and in allowing the pulley to be moved in the opposite direction by the spring to engage the clutch members. The cam sleeve 22 is rocked in a direction to disengage the clutch members by a rack 30 formed on the upper end of a vertically movable bar 32, the lower end of which rides on a cam rib 34 secured to the upper face of the cam carrying gear 36. When the bar 32 rides up on to the cam rib, the cam sleeve 22 is rocked so that the cams 24 and 26 force the sleeve in a direction to disengage the clutch members. When the bar rides off of the cam rib, the sleeve is allowed to rock in the opposite direction so that the spring 10 engages the clutch members.

When the members of the driving clutch are disengaged, the shaft 2 is stopped in a predetermined position by a stop arm 38 carrying a stud 40 which cooperates with a stop cam 42 connected with the clutch disk 8. The stop cam is mounted on the hub of the clutch disk 8, and is connected therewith by a pin 44 which passes through a segmental slot formed in the clutch disk, and is engaged by one end of a spring 46, the other end of which bears against a lug 48 on the clutch disk.

The stop arm 38 is secured to a vertical

rock shaft 50, and is connected with a spring 52 which yieldingly supports the arm in position with the upper end of the shaft against a stop screw 54, and also tends to swing the arm in a direction to bring its stud 40 into the path of the stop cam 42. When the clutch members are in engagement, the stop arm is held out of the path of the cam 42 against the tension of the spring 52 by a cam 55 on the carrying gear 36 which engages an arm 56 on the lower end of the shaft 50. The cams 34 and 55 are so arranged that when the clutch members are disengaged the arm 56 is released so that the spring 52 may swing the stop arm into active position and bring its stud 40 into the path of the cam 42. At this time the stop 40 rides along the inclined side 58 of the cam, so that the stud moves gradually into the path of the cam. After the clutch members have been disengaged, the rotation of the shaft 2 continues under the inertia of the parts, and the end of the stud 40 rides over the braking portion 60 of the cam 42, which depresses the stop arm against the tension of the spring 52, thus gradually overcoming the momentum of the parts. As the end of the stud rides off the portion 60 of the cam, it is engaged by the abrupt rise 62, so that the shaft 2 is brought to rest with the end of the stud in the low part or depression between the braking portion 60 and the stopping portion 62 of the cam, as indicated in Fig. 2. When the stop arm swings into active position, the stud 40 rides against a wear plate 64 which is secured to the rear face of the cam 42 and acts to accurately position the stud with relation to the cam.

In order that the stopping mechanism may operate in the most efficient manner, and with the minimum shock and jar, it is desirable that the point in the rotation of the shaft at which the clutch members are disengaged should be varied in accordance with the speed at which the machine is being driven. If the speed increases at any time during the operation of the machine, the clutch members should be disengaged earlier in the rotation of the shaft, in order that the momentum of the parts may be properly overcome before the shaft reaches the stopping position. If the speed decreases, on the other hand, the clutch members should be disengaged later, in order that the parts may be brought to stopping position by the momentum of the parts. Means is accordingly provided by which the operator may quickly and conveniently vary the timing of the clutch disengaging devices. In the construction shown, this is accomplished by forming worm teeth on the periphery of the stationary cam disk 28, which are engaged by a worm 66 secured on a shaft 68. The shaft is provided with a

knurled head 70 which is in position where it may be conveniently manipulated by the operator during the running of the machine, in case it is found desirable to vary the timing of the disengagement of the clutch by reason of any variation in the speed of the driving mechanism through which the machine is driven.

If at any time during the running of the machine the parts are not brought to stopping position, the operator may, between the sewing of successive buttonholes, make a slight adjustment of the knurled head 70, and she may make successive adjustments between the sewing of successive buttonholes until the stopping devices are operating properly, without material interference with her work or the rapidity with which successive buttonholes are being sewn. In like manner she may adjust the stopping mechanism so that the parts will be brought to rest in proper position without undue shock or jar, in case she finds that the stopping mechanism is not operating properly and efficiently.

While it is preferred to employ the specific construction and arrangement of parts shown and described in embodying the invention in the machine illustrated in the drawings, it will be understood that the invention is not confined in its application to this machine, and that the construction and arrangement of the parts may be varied and modified as found desirable or best suited to the construction of the machine in which it is to be embodied.

Having explained the nature and object of the invention, and specifically described one form of mechanism in which it may be embodied, what is claimed is:—

1. A machine of the class described, having, in combination, a shaft, mechanism for automatically throwing off the power, stopping devices for stopping the shaft in a definite position, and means within convenient reach of the operator for adjusting the timing of the power throw-off mechanism with relation to the stopping position.

2. A machine of the class described, having, in combination, a shaft, mechanism for automatically throwing off the power, a stop cam on the shaft, a retarding and stopping plunger cooperating with the cam to stop the shaft in a definite position, and means within convenient reach of the operator for adjusting the timing of the power throw-off mechanism with relation to the stopping position.

3. A machine of the class described, having, in combination, a shaft, mechanism for automatically throwing off the power, a stop cam on the shaft having an eccentric braking portion and a stopping depression, a spring pressed plunger cooperating with the cam to retard and stop the shaft, and means

within convenient reach of the operator for adjusting the timing of the power throw-off mechanism with relation to the stopping position.

5 4. A machine of the class described, having, in combination, a shaft, driving mechanism therefor, mechanism for automatically throwing off the power and for retarding and stopping the shaft in a definite position, and devices for regulating the relative
10 operation of the power throw-off and the retarding and stopping mechanism arranged for manual adjustment by the operator while running the machine.

15 5. A machine of the class described, having, in combination, a shaft, driving mechanism therefor, stopping devices for stopping the shaft in a definite position when the power is thrown off, a rocking cam sleeve
20 for throwing off the power, a cooperating stationary cam disk, an adjusting shaft con-

nected to adjust the stationary disk and provided with a head within convenient reach of the machine operator.

6. A machine of the class described, having, in combination, a shaft, a driving clutch, stopping devices for stopping the shaft in a predetermined position when the clutch is disengaged, a rocking cam sleeve for disengaging the clutch, a cooperating
30 stationary cam disk provided with teeth, and a manually operable worm engaging said teeth.

7. A machine of the class described, having, in combination, a shaft, a driving
35 clutch, a rocking cam sleeve for disengaging the clutch, a cam connected to rock the sleeve, a stationary cam disk cooperating with the cam sleeve, teeth on the periphery of the disk, and a manually operable worm
40 engaging the teeth.

GEORGE S. HILL.