(No Model.) 2 Sheets—Sheet 1.

C. A. DAHL.

CLUTCH FOR SEWING MACHINES.

No. 503,311. Patented Aug. 15, 1893.

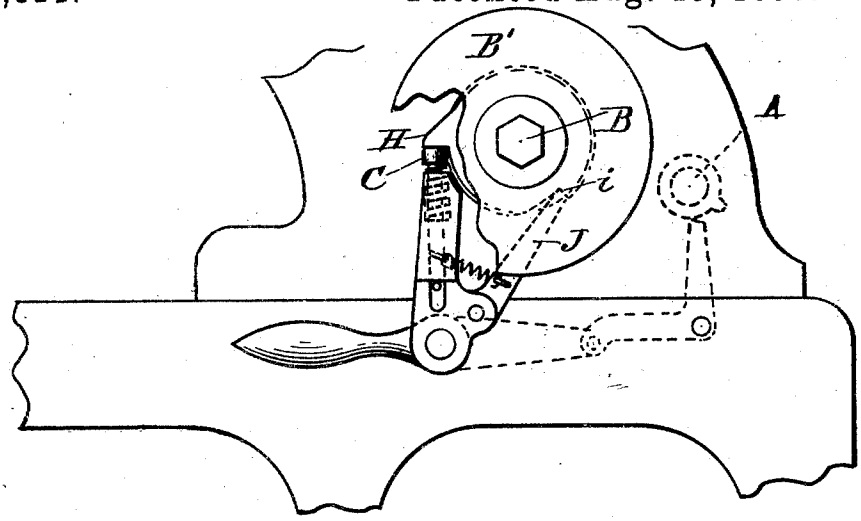

Fig. 1.

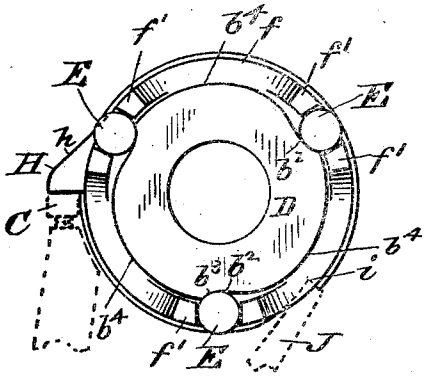

Fig. 3.

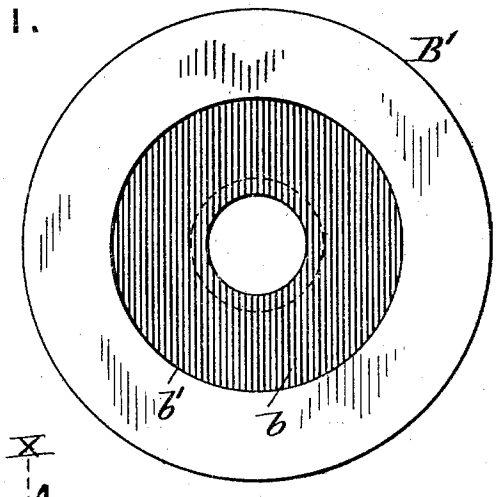

Fig. 4.

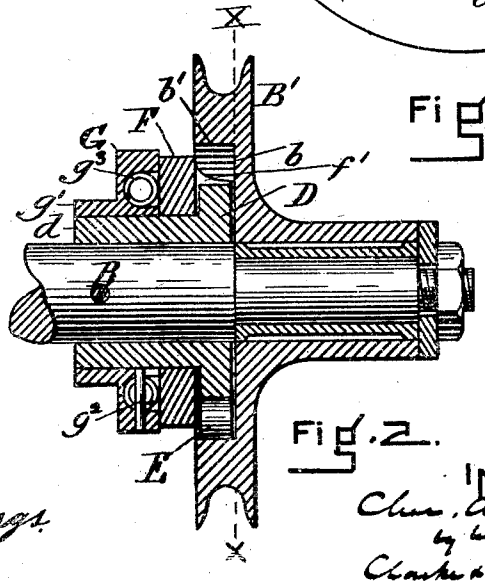

Fig. 2.

WITNESSES
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(No Model.) 2 Sheets—Sheet 2.

C. A. DAHL.

CLUTCH FOR SEWING MACHINES.

No. 503,311. Patented Aug. 15, 1893.

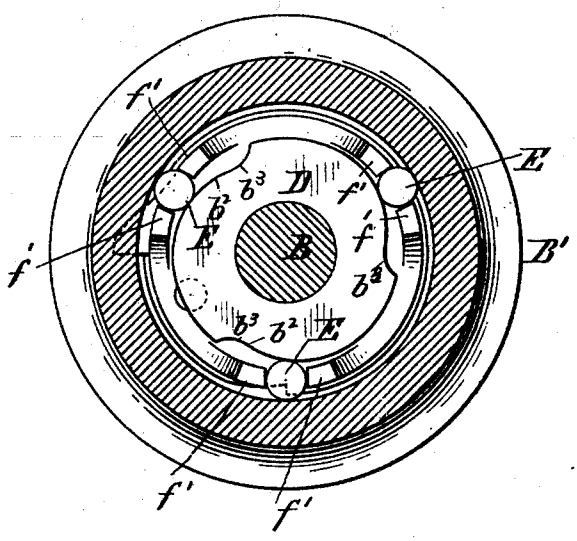

Fig. 5.

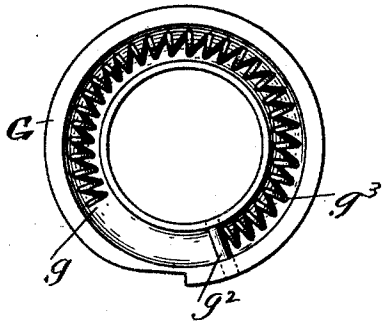

Fig. 6.

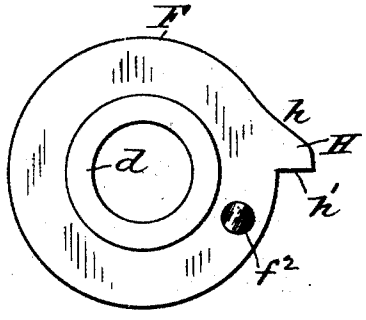

Fig. 7.

WITNESSES.
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UNITED STATES PATENT OFFICE.

CHARLES A. DAHL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE GLOBE BUTTONHOLE MACHINE COMPANY, OF KITTERY, MAINE, AND BOSTON, MASSACHUSETTS.

CLUTCH FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 503,311, dated August 15, 1893.

Application filed June 1, 1893. Serial No. 476,251. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. DAHL, a subject of the King of Sweden and Norway, now residing in Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Clutches for Sewing and other Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification and explaining its nature.

The invention is represented in the drawings as applied to the button hole stitching machine described in Letters Patent No. 450,950, dated April 21, 1891. The clutch is represented as automatically started and automatically stopped, and it is of a nature to do both actions with as little shock to the machine as possible, and it is thereby very useful and desirable in rapid running machines like sewing machines.

In the drawings, Figure 1 is a view principally in elevation of a sufficient part of the button hole sewing machine to illustrate the features of my invention. Fig. 2 is a vertical section taken through the driving pulley and other portions of the clutch. Fig. 3 is a view principally in elevation of the cam disk, rolls and roll holder, to which reference will hereinafter be made. Fig. 4 is a view in elevation of the inner face of the driving pulley. Fig. 5 is a view principally in vertical section upon the dotted line $x\ x$ of Fig. 2, and Fig. 6 is a view of the spring holding plate, having an annular recess, and the spring contained therein. Fig. 7 is a back view of the roll holder.

A is the shaft actuating the button hole cutting devices, and B is the shaft actuating the stitching devices. The shaft A is designed to make one revolution and stop, and it carries a cam which at the end of its revolution, communicates motion to intermediate mechanism, which releases a latch or holder and permits the clutch to operate to engage the driving pulley B′ on the main shaft B, and to maintain said engagement until the latch or holder is returned to its original position to engage the clutch and thereby release it from the driving pulley.

The means whereby the latch or holder which is lettered C is caused to be moved by the starting cam on the shaft A to become disengaged from the clutch, and by which it is returned at any predetermined interval, are described in said Patent No. 450,950; but, of course, I do not confine myself to the especial mechanism therein described for so actuating the latch or holder, but may use any suitable mechanism for moving it out of and into operative connection with the clutch.

The driving pulley B′ has a bearing on the main shaft B of the stitching mechanism, and constantly rotates thereon. It has in its inner face an annular recess b and the cylindrical surface b' forming or surrounding this recess furnishes one of the bearing surfaces of the clutch. There is fastened to the shaft B′ to turn with it a cam disk D. This cam disk has a sleeve d which extends backward from it and surrounds the shaft B and the main portion of the disk is contained in the recess b. The edge of this cam disk D is of the shape represented in Fig. 3, that is, it has the tangential sections b^2 each of which extends from a point b^3 nearest the center of the disk outwardly and quite slowly to the point b^4 which is farthest removed from the center of the disk. These inclines are relatively slow in their action, and they serve to move outwardly and hold the rolls E in contact with the surface b' of the driving pulley, when said rolls are caused to be moved on said surfaces by the roll holder F.

The roll holder comprises a disk f which has a limited turning movement upon the sleeve d of the cam disk. It has extending from its inner face the roll holding fingers or arms f' which are arranged in pairs separated from each other by a space sufficiently large to receive a roll and permit it to turn. The roll holder in question has three sets of fingers, as it is designed to hold three rolls. The roll holder has also a pin or projection f^2 upon the face opposite to that bearing the fingers which extends into an annular cavity g in the plate G. This plate G has a collar g' which surrounds the sleeve d of the cam block and is fastened with it to the shaft B. In the annular recess g in this plate there is a stop or

pin g^2, with which the stop or pin f^2 of the roll holder is adapted to come in contact, and it limits the movement of the roll holder in one direction. There is also contained in this annular groove or recess a spring g^3 which bears against the pin or stop f^2 of the roll holder and serves to return it against the stop g^2 and to hold it against the stop g^2. When the roll holder is moved against the spring, it also moves the rolls E down the inclines of the cam block and away from the surface b' of the driving pulley, and consequently disengages the main shaft from the driving pulley. When, however, the spring is permitted to act, it moves the roll holder in the opposite direction, and thereby causes the rolls to be moved up the inclines and into contact with the surface b' of the driving pulley and a union being thus accomplished, the shaft B begins to revolve and the roll holder F revolves with it.

To stop the roll holder and thereby disengage the rolls from the driving pulley, and to compress the spring and hold the roll holder with the spring compressed ready for release and engagement with the driving pulley, the roll holder has extending from its edge a projection or arm H, the outer surface h of which is inclined, and the under surface h' forms a shoulder.

The latch or shoulder C has a movement toward and from the edge of the roll holder; when away from the roll holder, it may revolve without limit, but when moved into the path of the projection H, it stops the rotation of the roll holder, relatively, gradually, the shoulder of the projecting finger of the roll holder shutting upon the end of the latch or holder. This removes the rolls from between the cam surfaces and the surface b' of the driving pulley and compresses the spring. Upon the movement of the latch or holder C away from the finger H, the spring causes the roll holder to be turned sufficiently to bring the rolls into wedging relation to the surface b and rotation is thus established. The inclines are so gradual, and the nature of the engaging and disengaging movements of the rolls is such that the machine is started and stopped with very little, if any, jar or shock, even when running at a very high rate of speed. To prevent a recoil, there may be used a detent I to close behind the tooth or notch i formed in the edge of the plate G.

While I have thus fitted the clutch as applicable to sewing machines, I do not limit myself to its use in connection therewith.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The improved clutch herein described, the same comprising a driving pulley having an annular recess in one face, the cam block having inclines of the character specified contained in said recess and fastened to the shaft, a plate having a limited degree of rotation upon said shaft, provided with roll holders to extend into said recess between the cam edge and the wall of the recess, rolls carried thereby, a spring to bear against the roll holder plate and move it in one direction and a stop for limiting its movement in the reverse direction, a stop finger or arm extending from said roll holder, and a latch movable out of and into the path of rotation of said finger or arm, substantially as described.

2. The combination of the driving pulley free to rotate on its shaft and having in one face an annular recess, a cam block fast to said shaft within said recess, the roll holder having a limited rotation upon the shaft and provided with fingers for holding rolls between the cam and the bearing surface of the driving pulley, the said roll holder having an outwardly extending projection or finger and a projection or pin which enters an annular recess in a plate fast to the shaft, a stop in said recess for limiting the extent of rotation of the roll holder in one direction and a spring in said recess to bear against the roll holder pin or projection, as and for the purposes described.

CHARLES A. DAHL.

Witnesses:
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F. F. RAYMOND, 2d.