

G. L. BOURQUIN & R. LOEB.
 DRIVING AND STOP MECHANISM FOR EMBROIDERING MACHINES.
 APPLICATION FILED MAY 3, 1904.

1,034,759.

Patented Aug. 6, 1912.

3 SHEETS-SHEET 1.

Fig. 1.

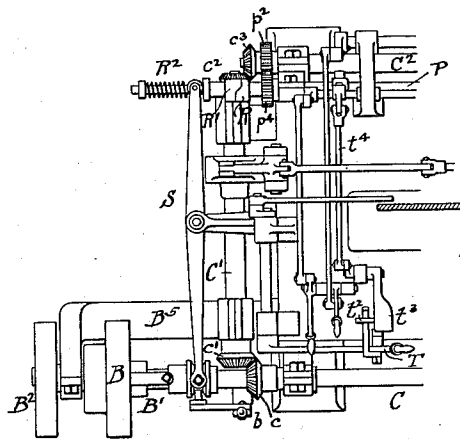


Fig. 2.

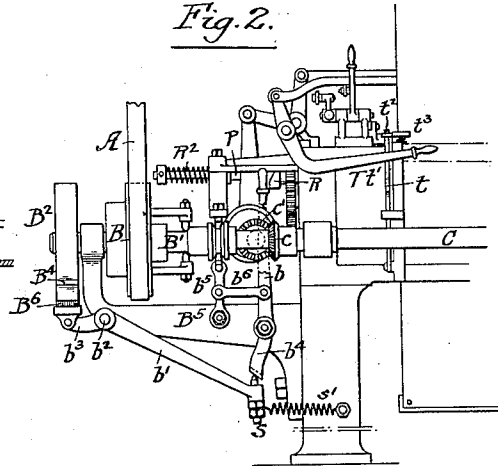
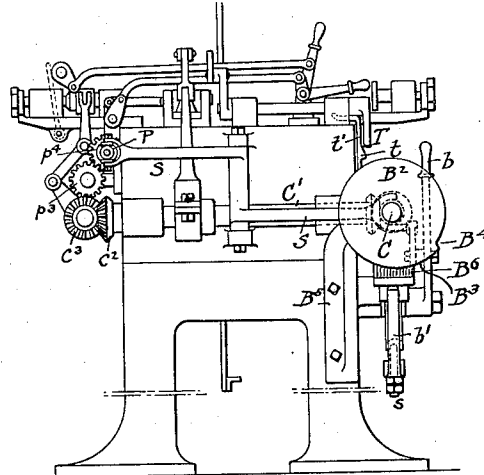


Fig. 3.



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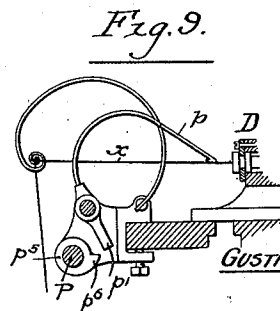
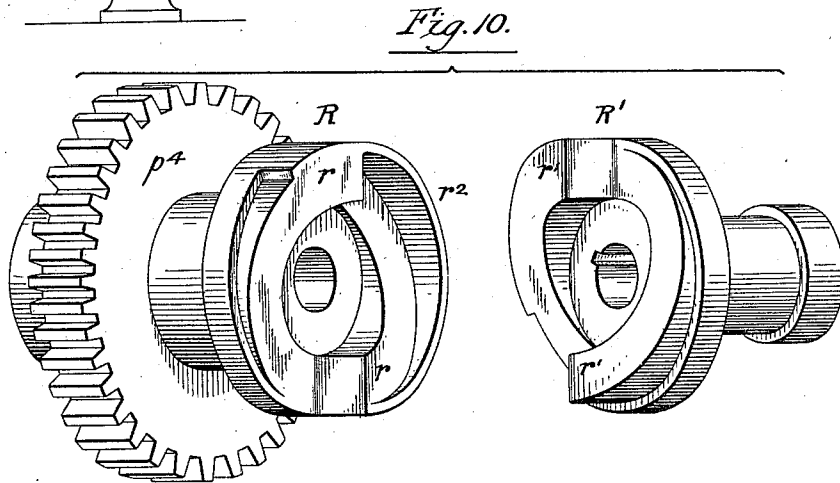
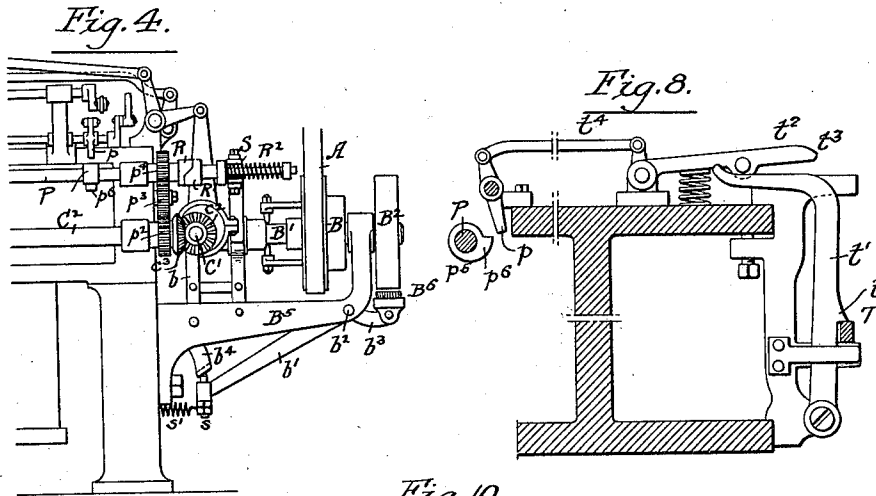
Howson & Howson

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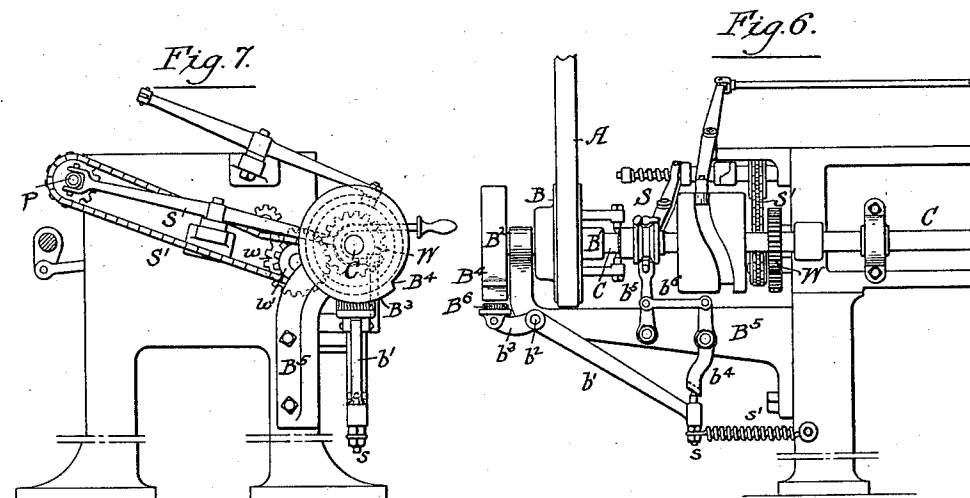
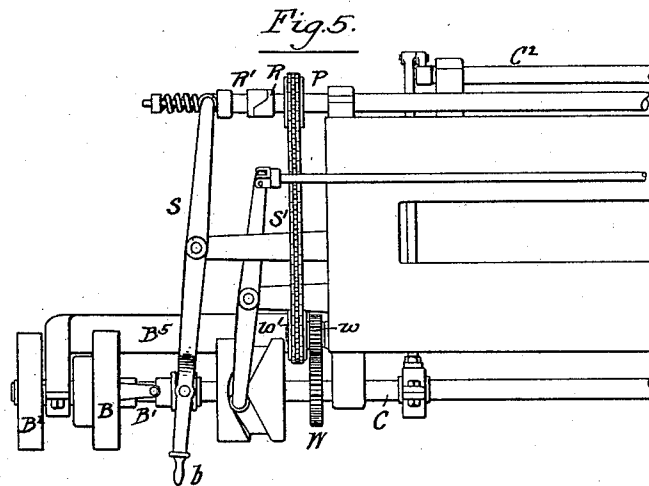


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3 SHEETS--SHEET 3.



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UNITED STATES PATENT OFFICE.

GUSTAVE LOUIS BOURQUIN, OF MERCHANTVILLE, AND RUDOLF LOEB, OF CAMDEN,
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DRIVING AND STOP MECHANISM FOR EMBROIDERING-MACHINES.

1,034,759.

Specification of Letters Patent.

Patented Aug. 6, 1912.

Original application filed August 6, 1898, Serial No. 687,946. Divided and this application filed May 3,
1904. Serial No. 206,235.

To all whom it may concern:

Be it known that we, GUSTAVE LOUIS BOURQUIN, a citizen of the Republic of Switzerland, and a resident of Merchantville, Camden county, New Jersey, and RUDOLF LOEB, a citizen of the United States, and a resident of Camden, Camden county, New Jersey, have invented certain Improvements in Driving and Stop Mechanism for Embroidering-Machines, (being a division of an application filed August 6, 1898, Serial No. 687,946,) of which the following is a specification.

Our invention relates to embroidering machines and consists of certain improvements in driving and stop mechanism for that character of embroidering machines illustrated and described in the patent of Charles N. Wurth, No. 271,182, dated January 23, 1883, or that forming the subject of our prior application before referred to.

The object of our present invention is to facilitate the stoppage of the machine within a single revolution of the driving shaft and to provide means whereby such stoppage can be effected manually, or by special mechanism controlled manually, or by the operation of mechanism controlled by the thread and placed in the operative position by the breaking of the same.

Our invention is fully shown in the accompanying drawings, in which:

Figure 1, is a plan view of the mechanism at the driven end of an embroidering machine of the character to which our invention has been applied; Fig. 2, is a front elevation of the same; Fig. 3, is an end elevation; Fig. 4, is a rear elevation; Figs. 5, 6 and 7, are respectively, a plan, and front and end elevations of a structure showing a modification of a portion of our invention; Figs. 8 and 9, are sectional views of portions of the machine, illustrating details of our invention, and Fig. 10, is an enlarged perspective view of the special clutch members also forming a portion of our invention.

This mechanism, as noted above, has been applied to the embroidering machine of the character fully illustrated in the patent and application before referred to, hence it is unnecessary to describe herewith any portion of the embroidering mechanism, except

in so far as the connections for operating the same are shown in operative engagement or connection with the parts of the present mechanism.

The power for operating the machine is applied by a belt A to a pulley B on the main driving shaft C, and a friction clutch or coupling B' is mounted between the said pulley and the main driving shaft C whereby the latter may be driven and also in order that said shaft can be stopped and started by operating a hand lever b, or stopped by means of an automatic stop motion fully described hereinafter. Keyed to said shaft C is a wheel B² having an enlargement B³ upon its periphery forming a braking surface which describes a helical curve, with an abrupt shoulder B⁴ between its highest and lowest point. A lever b' is pivoted at b² to a bracket B⁵ secured to the machine, the short arm b³ of said lever being provided with a brake shoe B⁶, while the long arm of said lever passes under an extension b⁴ of the lever b, so that when the latter is moved in one direction it forces the brake shoe against the wheel B² and holds said shoe rigid, while the high portion of the braking surface of said wheel jams against said brake shoe, thus effecting the stoppage of the machine within the limits of one revolution of the driving shaft C. The lever b may also be operated automatically by the clutch operating mechanism, which is connected to said lever by an arm b⁵ and connecting rod b⁶, the arm b⁵ being connected to the end of the lever S which operates the clutch B' and which is more fully described hereinafter.

Upon the shaft C is mounted a bevel gear wheel c which meshes with a bevel gear wheel c' on the counter shaft C', shown in Fig. 1, which in turn is geared to a shaft C² at the back of the machine by means of the bevel gear wheels c² and c³. The shaft C² runs parallel with the shaft C, and these two shafts C and C², driven in the manner described, effect the operation of the embroidering mechanism of the machine.

For the purpose of effecting the stoppage of the machine should any of the threads break, we provide a special form of stop mechanism, which may be actuated manually or which will operate automatically should any one of said threads break. At

the rear of the machine at each looper D is a stop lever p resting upon the thread, and this lever has an arm p' , all of which is clearly illustrated in Fig. 9. Extending
 5 along the rear of the machine is a shaft P which is driven by the shaft C² through a train of gears indicated at p^2 , p^3 and p^4 , and on said shaft P are sleeves p^5 having
 10 lugs p^6 , which sleeves are disposed below each stop motion lever p . These sleeves are so arranged in respect thereto that when any one of the threads break the arm p' of the particular stop motion lever will drop into the path of the revolving lug and will im-
 15 mediately stop the rotation of the shaft P.

Mounted loosely on the shaft P is a clutch head R, and carried by this clutch head R is the gear wheel p^4 , clearly illustrated in Fig. 10, which is one of the train of gears men-
 20 tioned above, and by means of which said shaft P is driven. To effect this positive movement, a clutch head R' fitting the clutch head R is splined to the shaft P, so that it will turn with it, but is free to slide thereon. This engagement is maintained
 25 during the operation of the machine by means of the spring R². The abutting faces of the clutch members R and R' have two bevel teeth indicated in the present instance
 30 at r and r' , clearly shown in Fig. 10, and on clutch head R a flange r^2 is formed, extending around a portion of the head, and this flange prevents the clutch head R' from en-
 35 gaging the clutch head R until a complete revolution of the stop shaft P and the driving shaft C has been made. This flange may be formed on the other member if desired, and the recess also reversed. This arrange-
 40 ment is provided for the purpose of insuring the engagement of the two parts of the clutch in this position so as to bring the lug on the shaft P always in the proper position to effect the stoppage of the machine and in
 45 such position that the projection of the clutch bears a definite relation to said lug, which is maintained by the relative position of the driving element or elements between the main driving shaft C and the shaft P. This operation of the clutch members R and
 50 R' could, of course, be effected by providing them with single beveled teeth so that they would engage in one position only, but by having two teeth we are enabled to equalize the strain upon the shaft when said mem-
 55 bers are brought together.

The brake wheel B² is so disposed and arranged with reference to the driving shaft, the stop shaft and the mechanism by which said stop shaft is driven, that when the
 60 movement of the stop shaft is arrested and the lever S is moved by the clutch members R and R' backing off, the brake shoe will be thrown into engagement with said brake wheel at the lowest point in the periphery
 65 of the same, so that as said wheel continues

its rotation the friction will increase and it will stop when its highest portion reaches the engaging brake shoe.

The clutch is provided for the purpose of stopping the machine automatically should
 70 any one of the embroidering threads break, as the machine may be stopped by the operation of the lever b , and may also be stopped through the medium of the stop shaft in a manner to be described. Upon the breaking
 75 of any one of the embroidering threads, however, one of which is shown at a , in Fig. 9, and the consequent stoppage of the shaft P through the operation of the mechanism just described, the continued rotation of the
 80 clutch head R, which is mounted loosely on the shaft P, through the medium of the train of gears, will cause the clutch head R' to back away from the head R and it will come in contact with one arm of the lever S,
 85 the other arm of said lever engaging the sleeve of the clutch B', before described, releasing the clutch and stopping the main driving shaft by means of the brake shoe B⁶, which is operated through the medium of
 90 the lever b' and the mechanism indicated at b^4 , b^5 and b^6 .

Referring to Fig. 8, there is shown a locking device which is provided to prevent the lever T from being moved, (said lever oper-
 95 ating the thread cutters and if moved while the machine is running will result in the breaking of the needles). The lever T is prevented from being raised by a projection
 100 t on the latch lever t' , the upper end of which extends under a pin t^2 projecting from a hand plate t^3 which must be pressed down before the latch can be opened, there-
 105 by withdrawing the rod t^4 which moves the stop p that it will engage with the lug p^6 on the stop shaft P, thus causing the machine to be stopped before the lever T can be raised.

A modified form of the driving and stop mechanism is shown in Figs. 5, 6 and 7. In
 110 this form of mechanism we employ a sprocket chain S' to drive the stop shaft P, said chain being driven by a gear wheel W on the driving shaft C which meshes with
 115 an intermediate gear w secured to the sprocket chain wheel w' over which the chain passes. This device can be readily used with our improved brake mechanism before described, and the clutch members R and R' which allow a complete revolution before
 120 they fall back into engagement, which is sufficient time to stop the machine and thus avoid breaking the chain or any part of the mechanism. By the improved mechanism forming the subject of our invention, stop-
 125 page of the machine can be immediately effected by the operator, or it may be effected by the breaking of any one of the threads, and the rapidity with which stoppage is ef-
 130 fected may be regulated according to the

speed of the machine by raising or lowering the bolt *s* so as to advance or retard the time of its contact with the beveled end of the lever *b*⁴. The lever *b*⁴ is held with its friction block away from the wheel *B*² by means of the spring *s*¹.

The machine is started by operating the lever *b* to the left and may be stopped by moving said lever to the right. It may also be stopped by operating the hand plate *t*² so as to move the stop *p* into engagement with one of the lugs of the stop shaft *P*; and the breaking of one of the threads will also effect the latter action.

15 We claim—

1. The combination, in mechanism for effecting the operation of an embroidering machine, of a driving shaft, a pulley thereon, clutch mechanism for connecting said shaft and pulley, a brake wheel on the driving shaft having an eccentric periphery, a brake lever having a shoe portion adapted to press against the surface of the brake wheel, and a lever for throwing the clutch mechanism into and out of gear and for operating the brake lever, the eccentric surface of the brake wheel being such that it will jam and stop the driving shaft within the limit of a single revolution.

2. The combination, in mechanism for effecting the operation of an embroidering machine, of a driving shaft, a pulley thereon, clutch mechanism for connecting said shaft and pulley, a brake wheel on the driving shaft having an eccentric periphery, a brake lever having a shoe portion adapted to press against the surface of the brake wheel, a lever for throwing the clutch mechanism into and out of gear and for operating the brake lever, the eccentric surface of the brake wheel being such that it will jam and stop the driving shaft within the limit of a single revolution, and means for operating said lever.

3. The combination, in mechanism for effecting the operation of an embroidering machine, of a driving shaft, a stop shaft, means for driving said stop shaft through a chain of gearing from the main driving shaft, a two-part clutch mounted on the stop shaft having jaws or toothed portions opposite each other, one of said parts being slidable on said shaft and the other loose, a flange on one member of the clutch to hold the other member out of engagement therewith until a complete revolution is made, a pulley on said driving shaft, clutch mechanism for connecting said shaft and pulley, and a lever connected to said driving shaft clutch mechanism, the clutch on said stop shaft acting on the lever which operates the driving shaft clutch mechanism.

4. The combination, in mechanism for effecting the operation of an embroidering machine, of a stop shaft, a two-part clutch

mounted on the stop shaft having jaws or toothed portions opposite each other, one of said parts being slidable on the stop shaft and the other loose thereon, and means carried by one member of the clutch to hold the other member out of engagement therewith until a complete revolution of said stop shaft has been made.

5. The combination, in mechanism for effecting the operation of an embroidering machine, of a stop shaft, a main driving shaft, means for driving said stop shaft from the main driving shaft through a chain of gearing at the rear of the machine, a clutch mounted on the stop shaft having engaging members, means carried by one member of the stop shaft clutch to prevent engagement of the parts until a complete revolution of the stop shaft has been made, a belt wheel on said driving shaft, clutch mechanism for connecting said shaft and wheel, and a lever connected to said driving shaft clutch mechanism, said stop shaft clutch acting on the lever which operates the driving shaft clutch mechanism.

6. The combination, in mechanism for effecting the operation of an embroidering machine, of a stop shaft, a clutch mounted on said stop shaft and having a plurality of teeth forming engaging members and a cam flange on one part of the clutch adapted to ride on the teeth or engaging members of the other part and prevent engagement of the parts until a complete revolution of the stop shaft has been made, the other part of said clutch having a recess to receive said flange, a driving shaft, a belt wheel thereon, clutch mechanism for connecting said shaft and wheel, and a lever connected to said driving shaft clutch mechanism, said stop shaft clutch acting on the lever which operates the driving shaft clutch mechanism.

7. In mechanism for effecting the operation of an embroidering machine, the combination of a driving shaft, a wheel having a cam surface mounted thereon, a lever, a brake shoe carried by said lever and adapted to bear against the cam surface of said wheel, a second lever, means for operating said second lever when a thread breaks, means whereby the operation of the second lever is transmitted to the first named lever to move its brake shoe into engagement with the braking surface of said wheel, and means for regulating the time of engagement of the means controlled by said second or operating lever and the tension of the brake shoe.

8. The combination, in mechanism for effecting the operation of an embroidering machine, of a driving shaft, a brake wheel thereon, a brake lever having a shoe adapted to bear against said brake wheel, a second lever adapted to move the brake lever into and out of engagement with the brake

wheel, and a screw in engagement with said second or operating lever for regulating the tension of said brake lever and shoe.

9. In mechanism for effecting the operation of an embroidering machine, the combination of a driving shaft, a stop shaft, lugs on said stop shaft, a rock shaft paralleling said stop shaft, arms carried by said rock shaft for engagement with the lugs of the stop shaft, means for placing said parts in the operable position, separable clutch members carried by the stop shaft, one of which is slidable on said shaft, mechanism for operating said stop shaft from the driving shaft, one of the elements of said mechanism being attached directly to and movable with one of the clutch members on the

stop shaft, a brake wheel carried by the driving shaft, a brake shoe for engagement therewith, and lever mechanism for throwing said brake shoe into the operative position, said lever mechanism being operated by the slidable clutch member of the stop shaft and serving to stop the driving shaft when the movement of said stop shaft is arrested.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

GUSTAVE LOUIS BOURQUIN.
RUDOLF LOEB.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."