No. 626,532. Patented June 6, 1899.

C. FAURE.

MECHANISM FOR PERIODICALLY DISPLACING FLEXIBLE RIBBONS.

(Application filed Nov. 22, 1898.)

(No Model.) 3 Sheets—Sheet I.

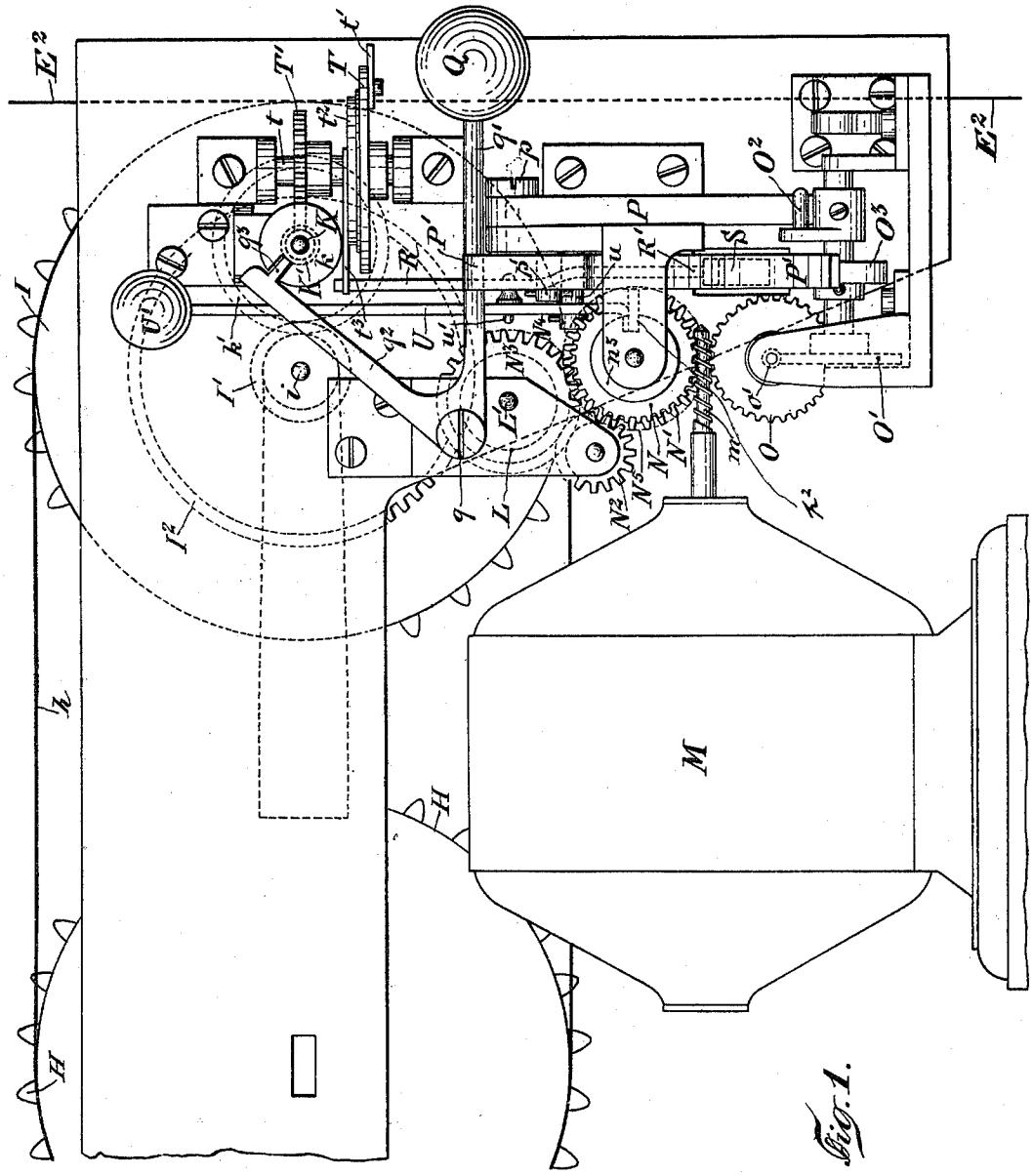


Fig. 1.

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Fig. 2.

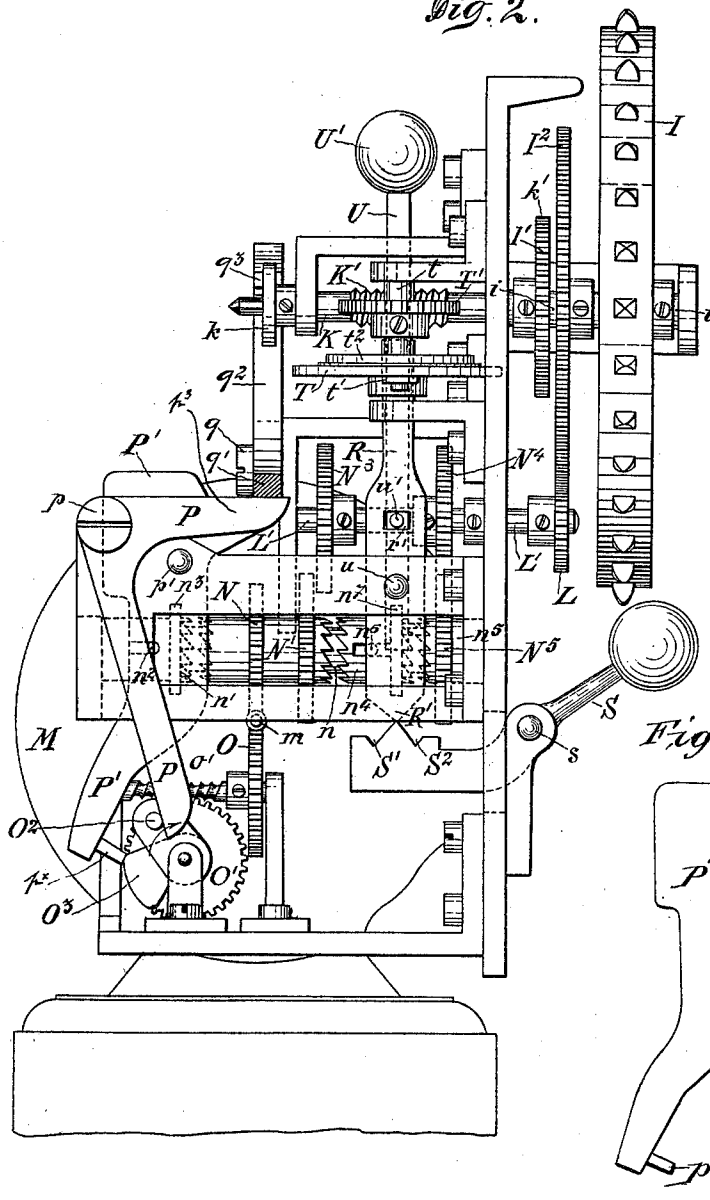
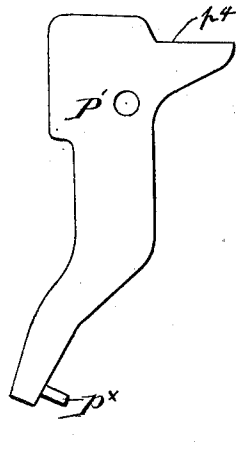


Fig. 2ª.



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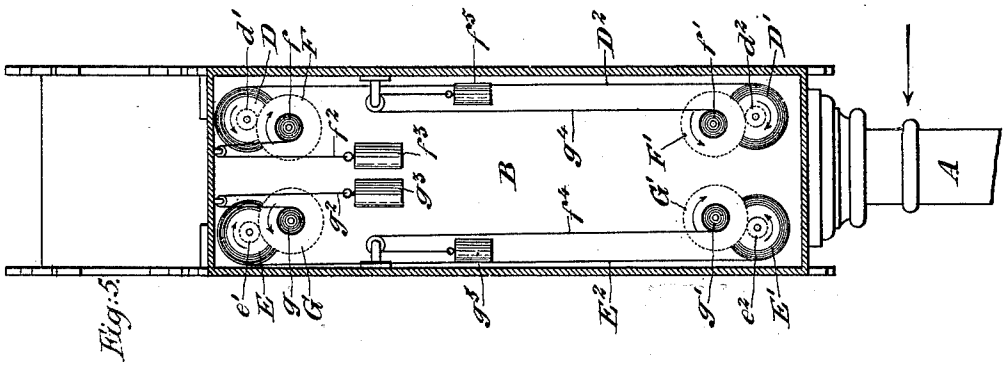


Fig. 5.

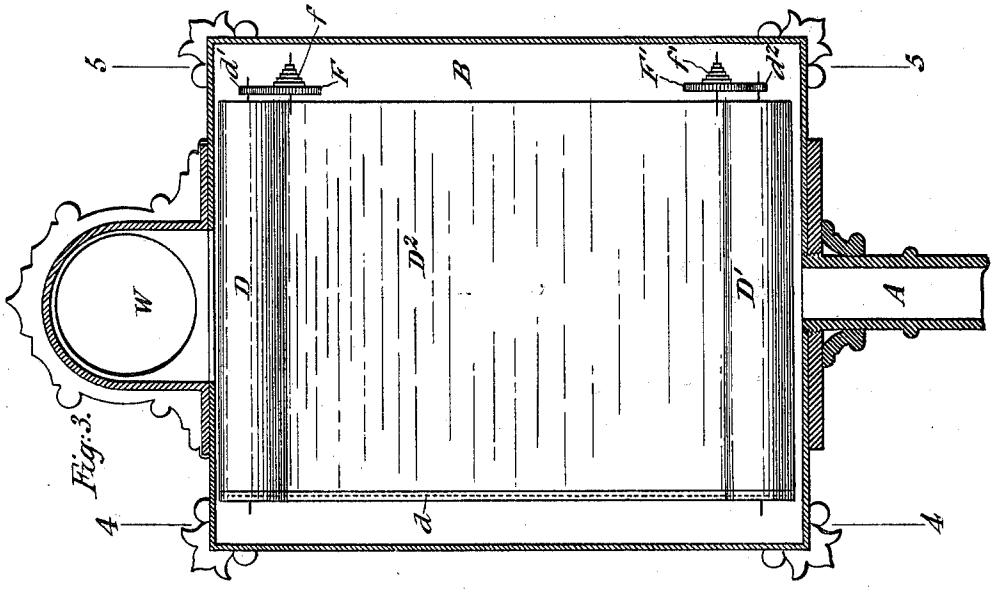


Fig. 3.

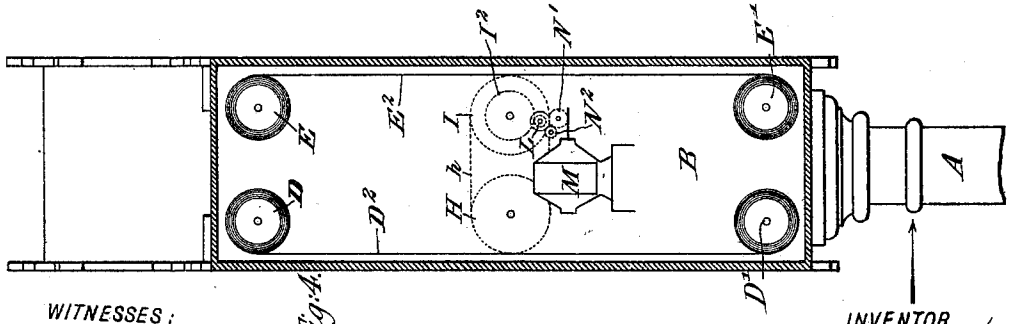


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES FAURE, OF GENEVA, SWITZERLAND.

MECHANISM FOR PERIODICALLY DISPLACING FLEXIBLE RIBBON.

SPECIFICATION forming part of Letters Patent No. 626,532, dated June 6, 1899.

Application filed November 22, 1898. Serial No. 697,144. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FAURE, mechanician, a citizen of the Republic of Switzerland, residing at Geneva, Switzerland, have invented certain new and useful Improvements in Mechanism for Periodically Displacing Flexible Ribbons, of which the following is a specification.

The purpose of the mechanism which is the object of the present application for patent is to display periodically (at predetermined intervals of time) opposite a suitable opening a flexible ribbon bearing, for instance, a series of pictures, notices, or advertisements and alternately unrolling itself from a roller and rolling up on another, the said mechanism causing, moreover, each picture or notice to stop during a predetermined time in front of the said opening and reversing automatically its progress when the ribbon has reached the end of its course.

In the annexed drawings, Figure 1 is a front elevation; Fig. 2, a side view of the mechanism causing the progressive motion of the ribbon bearing the pictures or notices or advertisements and causing the reversing of the motion. Fig. 2^a is a detail view of lever P'. Fig. 3 is a sectional front elevation of an exhibiting device with which my improved mechanism may be employed. Fig. 4 is a vertical section on line 4 4, Fig. 4; and Fig. 5 is a vertical section on line 5 5, Fig. 3.

In a box provided with suitable openings there are disposed one or more pairs of rollers, to each of which are fixed the ends of a ribbon having a perforated metallic border intended to gear both with the wheel H and with the wheel I of the mechanism. The wheels H and I are connected with one another by an endless perforated ribbon h, transmitting to the wheel H every motion of the wheel I.

D^2 E^2 are bands or ribbons which are engaged, respectively, by the toothed wheels H I and which may be rolled upon or from the rollers D D' and E E'. The casing B, which contains said parts, and, in fact, the entire mechanism to be described, is supported by a suitable post A. The movements of the ribbons are equalized by means of gear-wheels F F' and G G', meshing with pinions d' d^2 and e' e^2, which are fixed to the axes of rollers D D' and E E', respectively. The axes of the gear-wheels F F' and G G' bear pulleys $f f'$ and $g g'$, respectively, on which the cords $f^2 f^4$ and $g^2 g^4$ are alternately wound up or unwound by the counterweights $f^3 f^5$ and $g^3 g^5$. The action of the said weights is prevented by the gearing of the bands or ribbons D^2 and E^2 with the toothed wheels H and I, respectively, and only occurs when the said wheels are rotated, as hereinafter described.

The shaft i of wheel I bears a wheel I', engaging in the wheel k, fixed on the worm K, and a wheel I^2, engaging in the gear-wheel L, actuated by the motive device, which will now be described.

M is an electric motor, the shaft of which carries a worm m, engaging at same time in the first wheel N of the motive device and in the first wheel O of the device determining the length of the stops. The duration of same is determined by the duration of one rotation of the wheel O', acted upon by a worm formed upon the shaft o' of the wheel O, and consequently moving with a speed proportioned to the speed of the driving-shaft m, which may be predetermined at will. The shaft of the wheel O' bears a crank o^2, intended to move the bell-crank lever P, Fig. 2, pivoted at p to the frame, and the said shaft bears, further, an eccentric cam O^3, which bears upon a pin $p^\times$ on the bell-crank lever P', pivoted at p' to the frame, so as to move said lever P'.

The lever P is intended to lift by its horizontal arm p^3 the arm q' of a bell-crank lever pivoted at q to the frame and bearing a counterweight Q, Fig. 1. The arm q^2 of said lever bears a tooth q^3, intended to cause the stopping of the mechanism each time the worm K, and consequently the wheel I, which commands it, has made a predetermined number of turns, to which corresponds a predetermined length of ribbon displaced opposite the opening in which appear the pictures or notices painted on the said ribbon.

The lever P', acted upon by the eccentric O^3, is intended to axially displace the coupling-sleeve n' on the shaft n, upon which the wheel N is free. A pin n^2, working in a slot, connects the sleeve n' to the shaft n, and a flange n^3 of the sleeve n' is engaged between suitable projections p^2 (of which one is shown in dotted lines in Fig. 1) of the lever P', so as to be moved by same.

The hub of the wheel N, which is free on the shaft n, is provided with a teeth-range corresponding to the teeth-range of the coupling-sleeve n', the said wheel N having to turn freely on the shaft n during the stop of the ribbon, the length of said stop being determined by the eccentric O^3. The wheel N', which is also free on the shaft n, gears in the intermediate wheel N^2, which drives the wheel N^3. Moreover, the shaft n bears a third gear-wheel N^5, which is also free on said shaft and gearing with a wheel N^4, secured, like N^3, upon the shaft L' of the pinion L. Now it appears that if the rotation of the shaft L' is caused by the wheels N^5 N^4 it will take place in the inverse direction of the rotation caused by the wheels N' N^2 N^3, so that the ribbon will be unrolled either in one direction or in the other. The direction of rotation of the shaft L' is determined by the engagement of the sleeve n^4 either with the teeth of the wheel N' or with those of the wheel N^5, the said coupling-sleeve n^4 being connected to the shaft n by a pin n^6, working in a longitudinal slot of the said sleeve, which bears a flange n^7, engaged in a suitable slot of the coupling-lever U, which is pivoted at u to the frame and the lower end of which forms a point R', disposed so as to engage either in the notch S' or in the notch S^2 of a counterweight-lever S, pivoted at s to the frame.

The top of the lever R projects in rear of a disk T, the shaft t of which bears a worm-wheel T', engaged in the worm K above mentioned. The disk T bears on its lower face an adjustable finger t' and on its upper face an adjustable disk t^2, provided with a finger t^3. The described gearings are so combined as not to have the disk T making a complete revolution during the whole unrolling of the ribbon E^2, and the fingers t' and t^3 are fixed to the disk T in such a manner as to meet the lever R, the one when the ribbon E^2 is completely unrolled in one direction and the other when the said ribbon E^2 is completely unrolled in the inverse direction. Therefore the lever R is alternately oscillated now in one direction and then in the other by the fingers t' or t^3 and the lever S causes it to assume its extreme position either in one direction or in the other as soon as the said fingers t' or t^3 have brought it somewhat beyond its middle position.

The lever U, which has a slot in which engages the flange n^7 of the sleeve n^4, as indicated above, bears a counterweight U' and a projection u', which engages an opening r' of the lever R in such a manner as to have the displacement of the lever U by same taking place suddenly the moment when the lever L jumps from the middle position to one of its extreme positions. The said middle position is shown in Fig. 2; but the described piece never stops in the said position, as will be seen from the following description of the working of the apparatus.

The described apparatus works in the following manner: The driving-shaft m causes the wheels N and O to rotate continuously in opposite direction the one in regard to the other. Supposing the wheels O and O' to be in the position indicated in Fig. 2, the wheel N will be turning effectlessly, since it does not move the sleeve n', but the wheel O moves the wheel O', and consequently the finger O^2 and the eccentric O^3. The result is the lifting up of the arm q' by the lever P and the disengagement of the tooth q^3 out of the notch of the disk k. The driving mechanism of the ribbon E^2 is then free to rotate; but its rotation begins only the moment the lever P', escaping from the eccentric O^3, brings the sleeve n' into engagement with the corresponding teeth-range of the wheel N. The wheel N then moves the sleeve n', and consequently the shaft n, in a determined direction, (depending on the direction of the rotation of the shaft m of the motor.) According as the point R' of the lever R is engaged in the notch S' or S^2 of the lever S, this rotation of the shaft n produces the rotation of the shaft L', and consequently the rotation of the wheel I and the displacing of the ribbon E^2 either in one direction or in the other. While this motion takes place, the wheel O' goes on rotating and the finger O^2 slips from the lever P the moment the tooth q^3 is no more opposite the notch of the disk k, and the lever P takes again the position of Fig. 2, so that when the shaft K has made a whole revolution the tooth q^3 of the lever q^2, meeting again the notch of the disk k, the hammer Q may fall again to engage the said tooth q^3 in the said notch and stop again the mechanism. When falling down, the hammer Q strikes the horizontal arm p^4 of the lever P' and causes thereby the disconnecting of the sleeve n'. Then the finger O^2 lifts up again the hammer Q. During each of those operations causing the unrolling and longitudinal displacement of a determined length of the ribbon E^2 the worm K' makes one revolution, and accordingly causes a determined partial revolution of the wheel T' and of fingers t' and t^3. When the whole length of the ribbon is unrolled from a roller and rolled upon the other, one of said fingers t' or t^3 arrives into contact with the lever R and causes the reversing of movement by displacing the coupling-sleeve n^4. The same working is then renewed in the inverse direction.

Having thus fully described my invention, I claim—

1. In mechanism for periodically displacing a flexible ribbon, the combination of a drive-shaft, means for rotating the same, clutch devices mounted on a second rotary shaft, means for continuously rotating one of the members of the clutch mechanism from the drive-shaft, means operated by the drive-shaft for shifting one of said clutch members so as to mesh with the said continuously-rotating clutch member, a device controlled from the drive-shaft for intermittently stopping the move-

ment of the ribbon, said stopping device also acting on the said means for shifting the said clutch member, a shifting-lever for shifting another clutch member into mesh with the remaining clutch members, gears between the remaining clutch members and the means for driving the ribbon, means for shifting said shifting-lever at the end of each movement of the ribbon, as controlled by said stop device, and an automatic detent for holding said shifting-lever in its two positions, substantially as set forth.

2. In mechanism for periodically displacing a flexible ribbon, the combination of a drive-shaft, means for rotating the same, clutch devices mounted on a second rotary shaft, means for continuously rotating one of the members of the clutch mechanism from the drive-shaft, a lever operated by the drive-shaft for moving one of said clutch members so as to mesh with the said continuously-rotating clutch member, a shifting-lever for acting on another of the clutch members for causing it to mesh with the remaining clutch members, gears between the remaining clutch members and the means for driving the ribbon, means for shifting said shifting-lever at the end of each movement of the ribbon, as controlled by said stop device, an automatic detent consisting of a counterweighted lever provided with means for automatically engaging said shifting-lever, in its two positions, a notched disk continuously rotated from the said gears, and constituting the said means for driving the ribbon, and a counterbalanced lever controlled from the said drive-shaft and provided with a projection adapted to engage in the notch of said disk, and said counterbalanced lever being adapted to act on the first-named lever, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

CHARLES FAURE. [L. S.]

Witnesses:
ELMER SCHWING,
TH. MERL.