

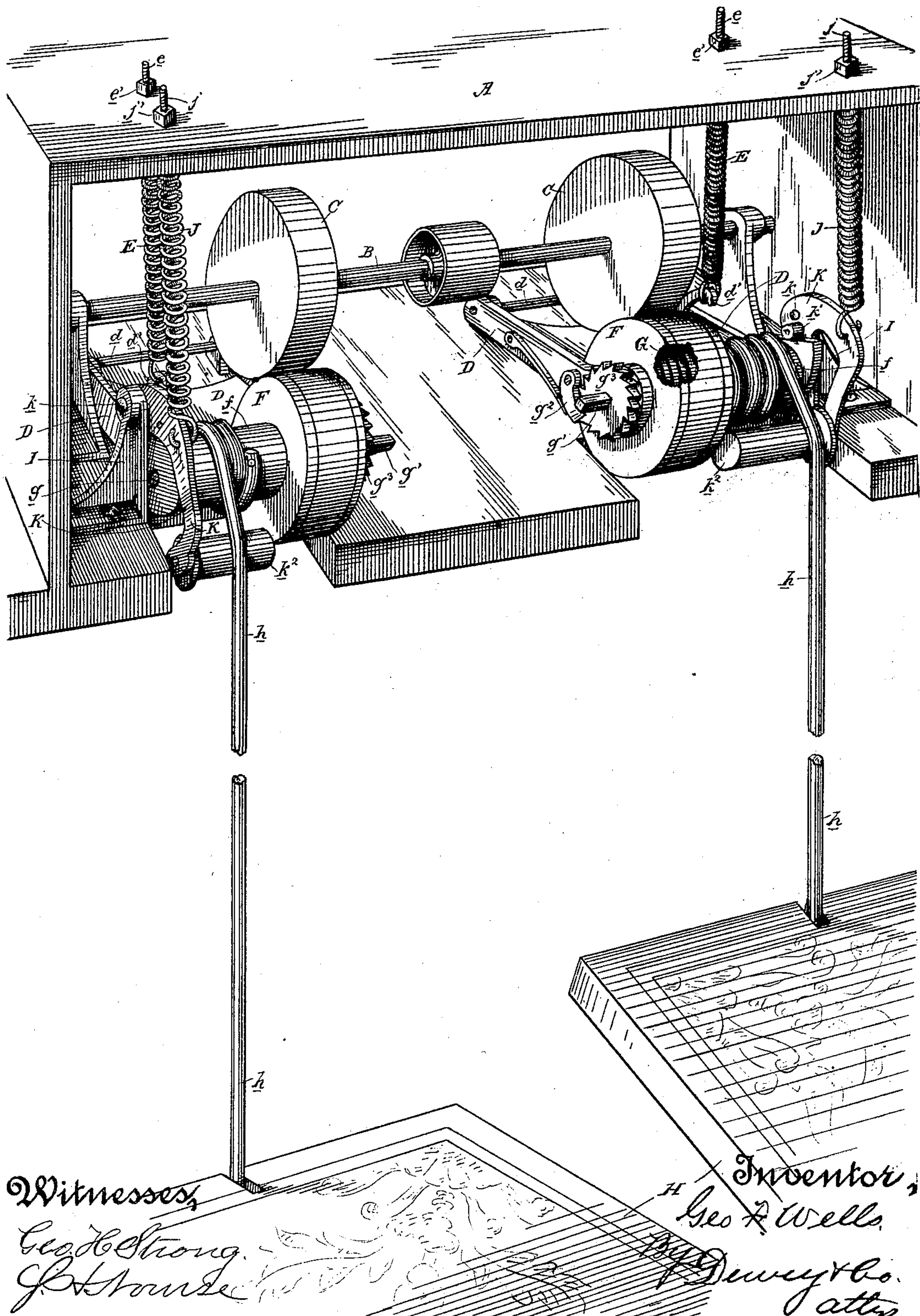
(No Model.)

G. F. WELLS.

MOTOR.

No. 390,929.

Patented Oct. 9, 1888.





# UNITED STATES PATENT OFFICE.

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## MOTOR.

SPECIFICATION forming part of Letters Patent No. 390,929, dated October 9, 1888.

Application filed May 12, 1888. Serial No. 273,731. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. WELLS, of the city and county of San Francisco, State of California, have invented an Improvement in Motors; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of motors, and especially to such motors as are adapted to receive and convert an intermittent or irregular power—such as from a treadle or treadles—into a steady continuous motion.

My invention consists in the constructions and combinations of devices, which I shall hereinafter fully describe and claim.

The main object of my invention is to provide a simple and delicate motor for transmitting a continuous regular and steady power. Its particular application is to automatic musical instruments of all kinds for rolling and re-rolling the music-paper with a continuous regular motion, notwithstanding the intermittent irregular application of the original power, such as is produced by the operation of treadles.

Referring to the accompanying drawing for a more complete explanation of my invention, the figure is a perspective view of my motor.

A is a frame, box, or casing of suitable character, in which is mounted in standards a shaft, B, which carries the friction pulleys or gears C, one near each end.

D is a bracket consisting of a frame having a pivotal center or pin,  $d$ , at one end, so that said bracket may have a movement in a vertical arc, this movement being controlled by a spring, E, the lower end of which is attached to an arm,  $d'$ , connected with the bracket, and the upper end is connected with a screw,  $e$ , which passes up through the frame and receives a nut,  $e'$ , whereby the tension of said spring may be regulated and the normal position of the bracket adjusted.

F is a hollow friction pulley or gear having on one side a winding-drum,  $f$ , said pulley and drum being mounted in the free end of the bracket D by a shaft,  $g$ . Upon this shaft and within the hollow pulley F is wound a power-spring, G, which is connected also with the pulley and effects its rotation. The spring is wound up by a key applied to the projecting

end  $g'$  of shaft  $g$ , and is held by a spring-controlled pawl,  $g^2$ , engaging a ratchet-wheel,  $g^3$ , on said shaft.

H is a treadle, from which extends a strap,  $h$ , to the drum  $f$  of the pulley F, and said strap is connected with and winds upon and unwinds from said drum, thus effecting the rotation of the pulley F.

Now the operation, as far as the mechanism has been described, is as follows: The spring G is first wound up to a proper tension, and there held from unwinding by the pawl  $g^2$ . Now by pressing down the treadle the pulley or gear F is partially rotated in a direction to wind up the spring G still farther, and when the treadle is released the spring in recoiling throws the pulley back. The first movement of the pulley is entirely free of the friction pulley or gear C, which is above it, because the pulling down of the strap  $h$  has the effect of pulling down on the pivoted bracket D, so that the pulley F clears the pulley C; but on the return movement the bracket-spring E pulls the pulley F up into contact with the pulley C, so that by these means a rotary movement in one direction is imparted to said pulley. This contact or impingement of the two pulleys ceases even before the return movement of pulley F has been completed, for this reason: the recoil of spring G is sufficient to wholly take up the slack of the treadle strap and to produce such a tension upon it, by trying to wind up more than is free, that said strap pulls down on the drum  $f$  at the end of the movement, and thus frees pulley F of contact with pulley C. The normal condition, therefore, of the two pulleys is a separated one, and this fact enables me to employ two treadles and operative connecting mechanism which may be worked alternately without interference. Accordingly it will be seen that in the other end of box or frame A are located the duplicates of parts heretofore described, and connected with a second treadle. By reason of the momentum of the shaft B and the employment of double treadle connections the motion of said shaft is a continuous and regular one, and its power may be transmitted to the mechanism to be driven. Now, while it is true that the downward pull on the treadle-



strap will of itself effect a separation of pulley F from pulley C when the former is being turned on its forward movement, I prefer to make this separation more positive and easier to be effected, rendering the operation more delicate and certain. This I effect by the following mechanism: Pivoted to a fixed standard, I, at the point  $k$ , is a bent lever, K, which carries a projecting roller stud or cam,  $k'$ , bearing upon one of the sides of bracket D near its free end. The free end of the lever K carries a roller,  $k^2$ , over which the treadle-strap  $h$  passes. A spring, J, is attached at one end to the lever K, and its other end is connected with a screw,  $j$ , which passes up through the frame A and receives a nut,  $j'$ , above, whereby the tension of said spring may be regulated. Now when the treadle-strap is pulled down its first effect is to pull down the roller  $k^2$  and its lever K, so that the stud or cam  $k'$  of said lever, moving about the pivotal center at  $k$ , bears down upon the bracket D and depresses it, so as to throw the pulley F out of gear with the pulley C; but this lever K so arranged effects the further purpose of permitting the instantaneous return of the pulley F the moment the treadle is relieved, so that none of the recoil of the spring G is lost. It will be seen that as soon as the strain on the treadle strap is relieved it is slacked up instantly by the rise of the lever-roller  $k^2$ , under the influence of spring J, which, thus taking upon itself this duty, leaves the bracket D wholly free to be affected by its spring E, so that it returns instantly and throws the pulley F into gear or contact with pulley C.

The motor is light-running and silent—qualifications which adapt it for the particular use intended. There are no dead-centers, and any kind of pedal-movement will give a perfectly even motion to the motor and consequently to the music-roll.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a motor, a pulley or gear to be driven, in combination with a pivoted bracket, a spring for controlling it, a pulley or gear carried thereby and engaging the first pulley or gear, a power-spring tending to turn the second pulley or gear in one direction, and power-connections for alternately winding the spring and pulling the bracket to disengage the pulleys and relieving the spring and bracket to effect the re-engagement of the pulleys or gears and the rotation of the second pulley or gear under the recoil of the power-spring, substantially as herein described.

2. In a motor, a pulley or gear to be driven, and a treadle, in combination with a pivoted spring-controlled bracket, a pulley or gear carried thereby and a power-spring tending to turn it in one direction, and a strap connection from the treadle for winding the spring and pulling down the bracket to disengage the pulleys or gears and to relieve the spring and bracket, whereby the re-engagement of

the pulleys or gears is effected and the second pulley or gear is rotated under the recoil of the power-spring, substantially as herein described.

3. In a motor, the pulley or gear to be driven and the treadle below, in combination with the pivoted swinging bracket D, spring E for controlling it, the hollow pulley or gear F, having a drum,  $f$ , and mounted on the free end of the bracket, the power-spring within the hollow pulley or gear and arranged to turn in one direction, and the strap connecting the treadle with the drum  $f$ , substantially as herein described.

4. In a motor, the pulley or gear to be driven and the treadle below, in combination with the pivoted bracket D, the spring E for controlling it, the hollow pulley or gear F, having a drum,  $f$ , the winding shaft mounted in the end of the bracket D and carrying the hollow pulley or gear and its drum, the power-spring within the pulley or gear F and connected with it and its shaft, the pawl and ratchet for holding the spring when wound, and the strap connecting the treadle with the drum  $f$ , all arranged and adapted to operate substantially as herein described.

5. In a motor, the swinging spring-controlled bracket D and the spring-actuated pulley or gear F, carried thereby, in combination with the pivoted bent lever K, having a stud or cam bearing on the bracket D, and a roller on its free end, and the treadle strap passing over the roller and operating the pulley or gear, substantially as herein described.

6. In a motor, the swinging spring-controlled bracket D and the spring-actuated pulley or gear F, carried thereby, in combination with the pivoted bent lever K, having a stud or cam bearing on the bracket D and a roller on its free end, the spring J for controlling the bent lever, and the treadle-strap passing over the lever-roller and operating the pulley or gear, substantially as herein described.

7. In a motor, the pulley or gear C to be driven, the pivoted bracket and spring E for controlling it, the hollow pulley or gear F, with drum  $f$ , carried in the free end of the bracket, and the power spring G within the pulley or gear for rotating it in one direction, in combination with the pivoted lever K, having a stud or cam bearing on the bracket for depressing it and effecting the disengagement of the pulleys or gears, the roller on the free end of the lever K, the spring J for controlling the lever, the treadle, and the strap connected therewith and passing over the lever-roller and connected with the drum  $f$  of the pulley or gear F, all arranged and adapted to operate substantially as herein described.

In witness whereof I have hereunto set my hand.

GEORGE F. WELLS.

Witnesses:

S. H. NOURSE,  
H. C. LEE.