

A. C. BRADLEY.

Improvement in Operating Fan-Tremolos for Organs.

No. 128,845.

Patented July 9, 1872.

Fig. 1.

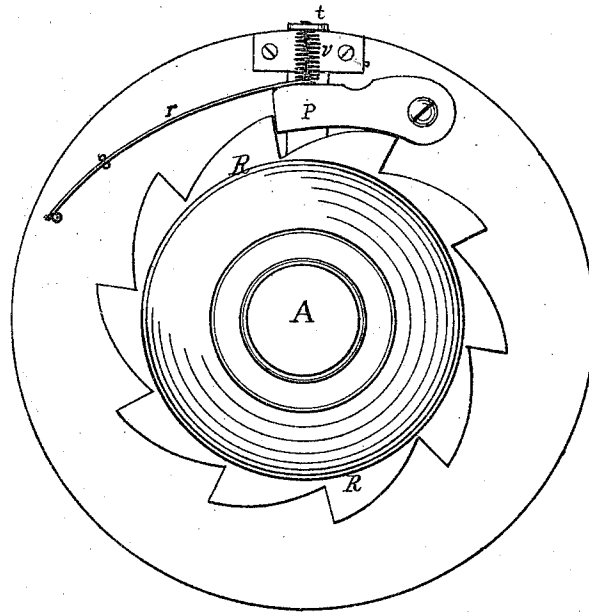
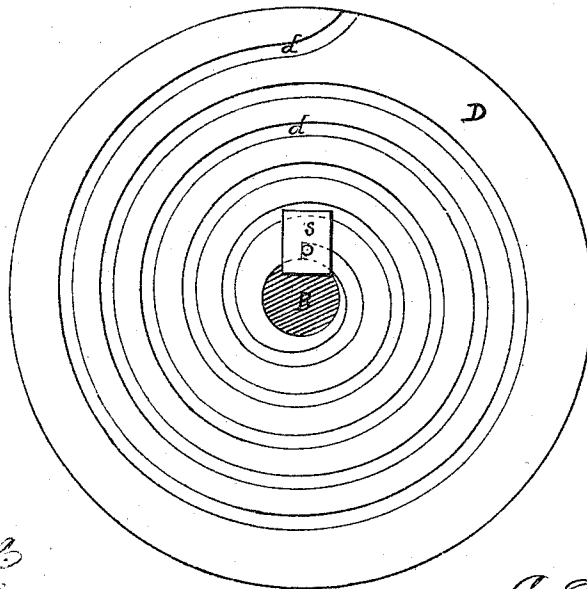


Fig. 2.



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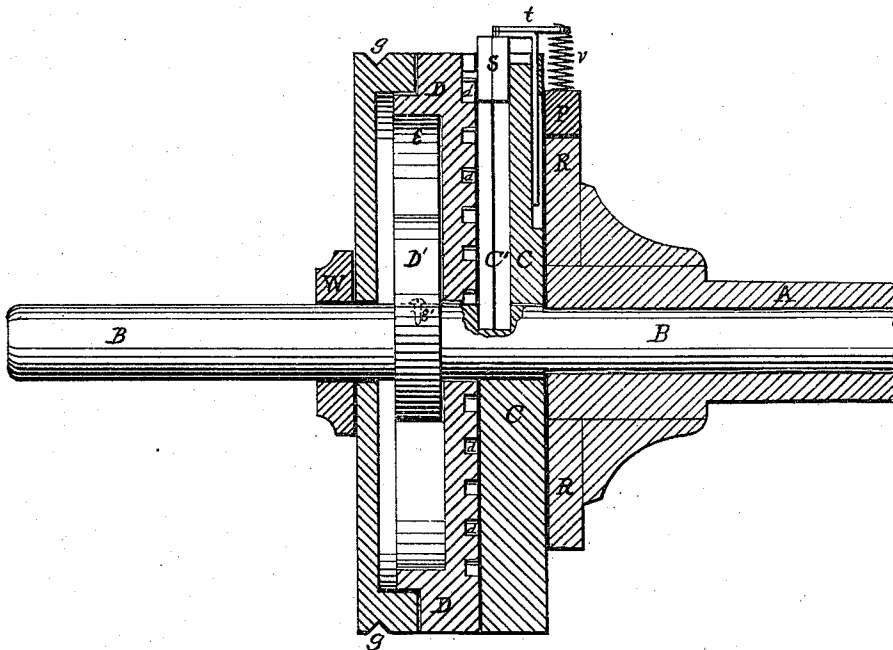
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*Fig. 3.*



*Fig. 4.*



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## UNITED STATES PATENT OFFICE.

ANDREW C. BRADLEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN OPERATING FAN-TREMOLOS FOR ORGANS.

Specification forming part of Letters Patent No. 128,845, dated July 9, 1872.

Specification describing certain Improvements in Operating Fan-Tremolos for Organs, invented by ANDREW C. BRADLEY, of the city of Washington, in the District of Columbia.

This invention relates to spring motors for fan-tremolos, and its objects are to apply the power to wind the spring through the pedal or lever used to operate the bellows, to continuously wind the spring when the fan is in use, and when the fan is not in use to wind up the spring to a proper extent, automatically disconnect it from the winding mechanism, and keep it so wound and ready for immediate action. It consists in applying a worm-groove or flange to a face of the drum or wheel, to which one end of a coiled spring is attached or which is actuated by one end of a coiled spring; in working said wheel face to face with a slotted plate carrying a slide provided with a projecting-pin adapted to run in said groove, such plate being rigidly attached to the shaft upon which said drum or wheel revolves, and to which the other end of the spring is fastened; and in using the power gained by the action of said groove upon said pin and slide to disconnect said spring from the winding mechanism; all as hereinafter more fully set forth.

In the drawing, which represents a device illustrating my invention detached from the organ, Figure 1 is a front view. Fig. 2 is a front elevation of the drum or wheel, showing the worm-groove and the slide in position at its lowest point. Fig. 3 is a vertical section, and Fig. 4 is a detached view, in perspective, of the slide and pin.

A is a hollow shaft, which, by means of a strap or straps from the pedal or lever used to operate the bellows, receives an oscillating or rocking motion. It is provided with a rack-wheel, R, and receives the shaft B, arranged axially to it, to which is rigidly attached the plate C, grooved to receive slide s. Fitted to revolve upon shaft B is drum or wheel D, which contains a coiled spring, D', one end of which is attached to said drum at e, and the other end to shaft B at e'. By turning shaft B and preventing the free revolution of drum D the coiled spring will be wound; and when wound or partly wound, if shaft B is held, said spring will cause the drum to revolve. This drum works face to face with plate C, as shown in

Fig. 3; and in its face, as shown in Fig. 2, is cut a groove, d, in the form of a scroll, which, by preference, is made to run from its inner to its outer coils in the same direction as that in which the spring is wound. Arranged to travel in this groove is pin p, attached to slide s. This slide works in a groove, C', in plate C, is at its lowest point in said groove, and in the position shown in Fig. 2 with relation to groove d, when the spring is unwound, and when the spring is being wound, the action of groove d upon pin p causes it to rise in said groove C'. A pawl, P, is so pivoted to plate C that, aided by spring v, it is acted upon by rack-wheel R. It is located just opposite to groove C' and its traversing-slide s. A T-slide, t, is arranged in a groove in plate C, opposite to groove C', as shown in Figs. 1 and 3, so that one arm extends over pawl P and is connected with the same by a spiral spring, v, while the other arm extends over groove C' in such wise that when slide s rises in said groove it will elevate slide t, and by means of spring v lift the pawl. It is designed that a clutch or other device shall be applied to shaft B that will admit of such shaft's turning in that direction only in which it is forced to wind the coiled spring; and that a catch or brake of some kind, to hold the wheel D when the fan is not desired to operate, shall be connected with the tremolo-stop.

The mode of operation is as follows: Suppose the clutch and brake referred to are applied to shaft B and drum D, respectively, and that shaft A is connected with the pedal or bellows lever, so as to receive the rocking motion. The movement of shaft A in one direction, by reason of the shape of the teeth of ratchet R, is free; but its movement in the opposite direction, so long as pawl P is permitted to act upon said ratchet, must carry with it plate C, which, being rigidly attached to shaft B, revolves said shaft (its revolution in that direction being permitted by the clutch) and partially winds coiled spring D'. When shaft A oscillates in its free direction, shaft B will be prevented from returning by the clutch. This motion of shaft A gradually winds the spring, and, inasmuch as it is continuous so long as the bellows are in use, it is obvious that when the fan is not in operation the spring will soon become wound up; and, unless the spring and its attachments are in some way

disconnected from the shaft A, either the spring or some part of the mechanism must break. This relief, when the spring is wound to the desired extent, is accomplished by means of the device hereinbefore described in the following manner: When spring D' is completely relieved, slide *s*, as before stated, will be at the bottom of groove C', and in the position with relation to groove *d* shown in Fig. 2. As the spring is gradually wound slide *s* is carried upward in its groove until it presses against the arm of slide *t* and elevates the slide, when spring *v* will be stretched; and as soon as pawl P is relieved of the pressure of ratchet R against it by the turning of shaft A in the other direction, spring *v* will lift the pawl clear of the ratchet and thus allow shaft A to oscillate freely. The spring remains wound and ready for action until the tremolo-stop is pulled, when it will respond immediately and communicate motion to the fan; and so soon as it shall have revolved sufficiently to allow slide *s* to partly descend and pawl P to fall upon ratchet R, the winding will be resumed. It is thus apparent that the spring will never be permitted to run down while the bellows are operated, and that, inasmuch as the tremolo is only used occasionally, that the best power of the spring will be always ready to operate upon the fan, and that the moment the stop is pulled motion will be communicated. Groove *d* is represented as terminating outwardly in a sudden upward curve, which is intended to impart a sudden upward motion to

slide *s* and elevation to slide *t*; but, practically, the regular curve of the scroll will be best.

It is designed that to carry slide *s* from its lowest to its highest position in groove C' will require as many revolutions of plate C and shaft B as are necessary to wind the coiled spring to its proper tension, the length of the groove and the capacity of the spring being adapted each to the other. The drum is represented as a band-wheel, but the invention is equally applicable to clock mechanism.

It is obvious that a flange can be substituted for the worm-groove, that the groove and slide can change places, and that other devices can be substituted for the T-slide pawl and rack.

I claim as my invention—

1. The combination of a wheel, provided on its face with a spiral guide, with a coiled spring, and a wheel or plate which carries a slide, arranged to be operated by the spiral guide, substantially in the manner and for the purpose set forth.

2. The combination of slide *s* with slide *t* and spring *v*, substantially as and for the purpose set forth.

3. The combination of slide *s*, slide *t*, spring *v*, pawl P, ratchet R, and shaft A, substantially as described, and for the purpose set forth.

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Witnesses:

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