(No Model.)

F. VAN FLEET.

MUSICAL BOX.

No. 417,797. Patented Dec. 24, 1889.

Fig. 1.

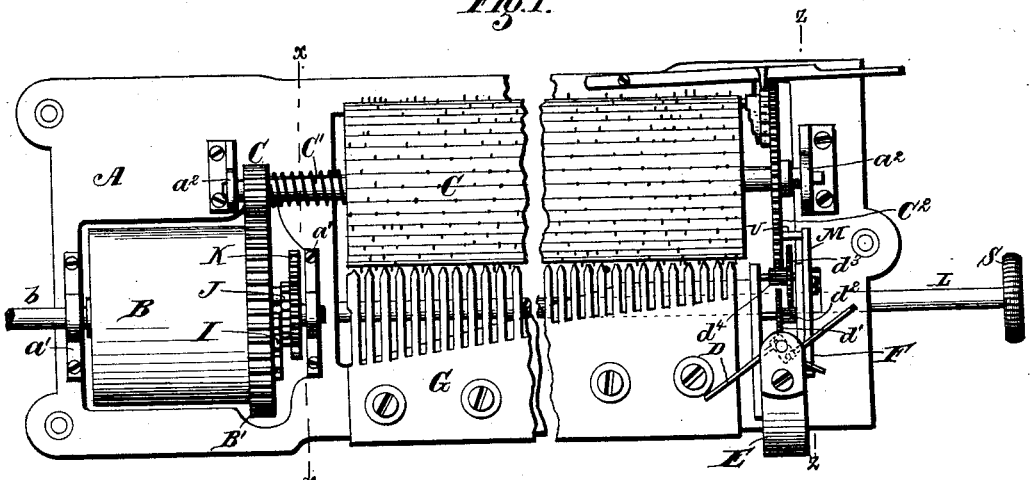


Fig. 2.

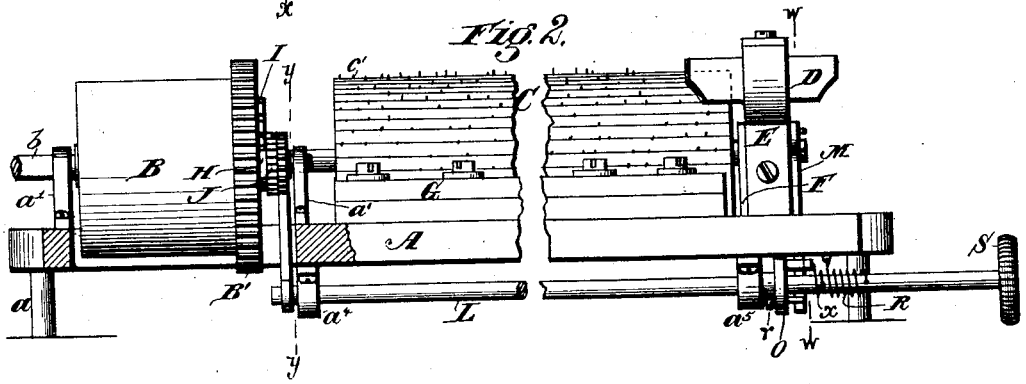


Fig. 3.

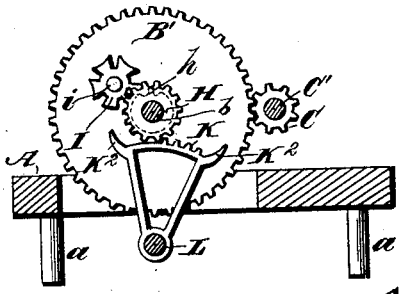


Fig. 4.

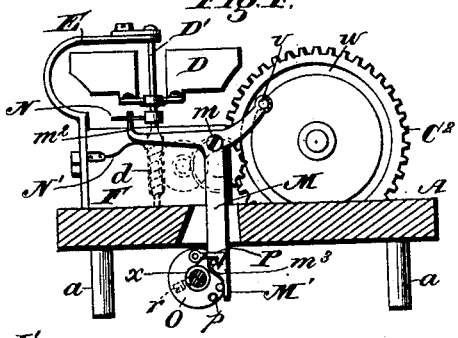
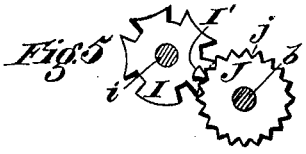


Fig. 5



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UNITED STATES PATENT OFFICE.

FRED VAN FLEET, OF WILLIAMSPORT, PENNSYLVANIA.

MUSICAL BOX.

SPECIFICATION forming part of Letters Patent No. 417,797, dated December 24, 1889.

Application filed May 20, 1889. Serial No. 311,396. (No model.)

To all whom it may concern:

Be it known that I, FRED VAN FLEET, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Musical Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The chief object of this invention is to provide means for preventing a musical box from stopping before the end of a tune or beginning to play again before it is sufficiently wound up to play a tune entirely through. This object I attain by means of the construction and combination of devices hereinafter particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a plan of the works of a musical box embodying my invention. Fig. 2 represents a side elevation of the same. Fig. 3 represents a transverse section on the line *x x* of Fig. 1 and *y y* of Fig. 2. Fig. 4 represents a similar section on the line *z z* of Fig. 1 and *w w* of Fig. 2; and Fig. 5 is an enlarged detail view of the notched wheel J and the locking-pins on the stop-wheel I.

A designates the supporting-frame of the works provided with legs *a* and with upper bearings a' a^2 a^3, as well as lower bearings a^4 and a^5.

B designates the spring-house or spring-barrel which drives the instrument and is mounted on a shaft *b* in fixed bearings a' a'. This barrel carries with it in its rotation on said shaft a gear-wheel B′, which meshes with the pinion *c* of music-cylinder C on shaft C′, journaled in bearings a^2 a^2. Said shaft, cylinder, and pinion turn together. A vertical shaft D′ carries a fan D, and is provided with a worm *d*, which meshes with a small gear-wheel d', turning with a pinion d^2, that again gears with a gear-wheel d^3, turning with another pinion d^4, taking into a large gear-wheel C^2 on the end of music-cylinder C. Of course this train of gearing between the music-cylinder and the fan-shaft may be lengthened or shortened at will. The fan-shaft D′ is journaled at its upper end in a bent standard E, and at its lower end in a recessed block F, which also affords bearings for the small shafts or arbors of the train-wheels aforesaid. The said fan acts as a fly-wheel, regulating the speed of the instrument. The teeth or pins *c′* of the cylinder C act in the usual way on the comb G. Indeed, the devices thus far described present no novelty.

The driving barrel or spring-house B is provided with the usual winding-stops H and I, the former being mounted on shaft *b* close to the inner face of said spring-barrel and turning with the latter. Its shape is that of a disk with a radial finger *h*. The other winding-stop I is mounted on a stud *i*, extending from the inner end of the barrel at a point between its periphery and shaft *b*. Its form is approximately that of a star with rays like the arms of a Maltese cross, one only being convex at the end. This stop I is arranged to operate with the other winding-stop H, in the ordinary manner. It has, furthermore, a pin I′ on its outer side near the base of one of its arms, which pin extends horizontally and is brought to an edge on the outer side, so as to be V-shaped in cross-section. This pin takes into V-shaped notches *j* in the periphery of a cog-wheel J, mounted loosely on shaft *b* at the inner side of stop H. This wheel, when said tooth and notched wheel are in engagement, turns with said stop H and spring-barrel B, and consists of two parallel integral parts of different diameter, one having said notches and the other and larger having cog-teeth which gear with a segment K. Said segment is toothed on a part of its curved face, as shown at K, the remainder being smooth. It has also a curved horn K^2 at each extremity. These horns act as stops limiting the movement either way by contact with wheel J. This segment turns with and gives motion to a shaft L, on which it is mounted, said shaft having its support in bearings a^4 a^5 below the frame A.

M designates a stop-lever having the shape approximately of the letter T and pivoted at the junction of its arms on a stud *m*, extending from block F. One cross-arm of said stop-lever is provided with a horizontal pin *v*, which extends into a circular slot *w* in the face of the gear-wheel C^2. Said circular slot has a notch for said pin to drop into and arrest the motion of the cylinder at the proper

point when the music-box stops. The said stop-lever is provided with a curved horn m^2 on the tip of the other cross-arm held in the path of rotation of a straight horn N, extending radially from the fan-shaft aforesaid by a spring N′, attached to block F, which presses upward against the under side of said curved horn. The contact of these two horns holds the instrument out of action. To provide for starting the music, the lower end of said stop-lever is recessed curvilinearly from one side to the tip at M′ and there fits against pins p on the outer face of a cam wheel or disk O, which is mounted fast on the shaft L. This disk or cam-wheel O also carries a pivoted catch P, which is arranged to engage with a pin m^3 on the lower part of stop-lever M, for the purpose of locking the same and preventing the music from being started accidentally. An adjusting-screw r, passing through shaft L, regulates the position of said catch to insure its action. A knob or milled head S on the end of shaft L affords means for conveniently turning said shaft back when set free. A spiral spring R, attached to said shaft at one end, returns the said shaft to its former position after release. The other end of said spring is fastened to the frame A or to some other fixed object. Another spring x holds the catch down to its work.

The operation is as follows: On winding up the spring the stop-wheel I is caused by the action of stop-wheel H to rotate in such a way that when the winding is complete the pin I′ unlocks from the notch j, which it has entered in the periphery of the smaller part of cog-wheel J, leaving the latter free to rotate. On then turning the knob S backward the pins p on disk O press against the curvilinear side of the lower end of the stop-lever M, tilting the curved horn m^2 thereof away from the horn N on the fan-shaft and holding it thus, so as to leave the latter free to operate, and the music begins to play. As the barrel B rotates, the finger h of stop-wheel H acts at intervals on the arms or rays of stop-wheel I, so as to bring the pin I′ around in a step-by-step motion until said pin engages with one of the notches j of wheel J, and said wheel thereafter turns with said barrel. As this wheel J rotates, it carries the segment K with it, rocking the shaft L until it comes to the blank or untoothed space on the periphery of said segment, when the latter and the shaft L stop moving. The cam wheel or disk O has by this time been carried forward into the position shown, when the pins p thereon no longer hold the horn m^2 out of engagement with the horn N, and the spring N′, or its equivalent, replaces the former horn in the path of the latter horn, once more stopping the instrument. At the same time the catch P drops over the pin m^3, holding said lever disk and shaft in the position shown and preventing any accidental starting of the machine. The combined action of this catch and pin, the stop-lever, and fan-shaft at one end of the machine and of the pin I′ and the notched wheel J at the other makes it impossible to start said musical box without first rewinding the driving spring-barrel B sufficiently to unlock said pin from said wheel, as aforesaid, when the knob S may be turned and the instrument started again.

My improved musical box provided with the automatic stop devices above described is absolutely prevented from stopping in the middle of a tune or at any point before the end. This avoids injury to the dampers and putting the instrument out of tune, beside the bad effect on the ear.

After my musical box has run down in playing one tune it cannot be started again until fully wound for another. Thus there is no danger that it will begin a tune without being prepared to carry that tune through.

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

1. In a musical box, the combination of the spring-barrel, a stop-wheel H, turning therewith, and another stop-wheel I, intermittently actuated by stop-wheel H, and having a pin or projection with a cogged wheel loose on the shaft of said barrel and having notches for locking with said pin, a toothed quadrant meshing with said cogged wheel, but having a part of its face without teeth, and having curved horns or projections at each extremity of its circumference, a shaft on which said quadrant is mounted and which turns therewith, and the fly-fan shaft and stop-lever which are freed by the turning of said shaft, for the purpose set forth.

2. In combination with a spring-barrel and music-cylinder and the stop-wheels H and I, the notched cog-wheel locked at intervals by a pin on the latter, the quadrant and shaft driven by said cog-wheel, a cam wheel or disk on said shaft provided with a pin and catch, a stop-lever provided with a pin for the engagement of said catch and arranged to be moved by the pin on said disk, and a fly-fan which is normally held motionless by said lever, but set free when the latter is tilted, substantially as set forth.

3. The combination of shaft L, having a knob for turning it and a replacing-spring with a cam or disk on said shaft having a projection on its face, a stop-lever arranged to be freed by said projection when said knob and shaft are turned backward, the musical-box mechanism locked by said stop-lever, the spring-barrel, and locking devices which prevent the turning back of said shaft until said spring-barrel is sufficiently wound to play at least one tune through to the end, substantially as described.

4. The driving spring-barrel B, the musical-cylinder fly-fan and their gearing, in combination with a stop-lever normally in position to lock said fan and provided with a pin to be held by a catch, a shaft L, having thereon a

disk or cam wheel which is provided with said catch, and also with projections for tilting said lever out of engagement, a quadrant partly toothed fast on said shaft, a notched cog-wheel gearing with said toothed quadrant, the spring-barrel, a stop-wheel carried by the said barrel between its center and its periphery, and provided with a pin which locks into the notches of said wheel, another stop-wheel actuating the former and turning concentrically with said barrel, and the shaft of said barrel on which the said cog-wheel is mounted loosely, there being no engagement between said cog-wheel and said barrel, except when the pin fits into one of the notches, as hereinbefore set forth.

5. In a musical box, the combination of the music-producing devices with a stop-lever therefor, a shaft and attachments for freeing said lever, a spring-barrel, and connections between said shaft and barrel which lock the former until the latter is wound up sufficiently to play at least one tune entirely through, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRED VAN FLEET.

Witnesses:
J. M. HALL,
FRANK S. MONTELIUS.