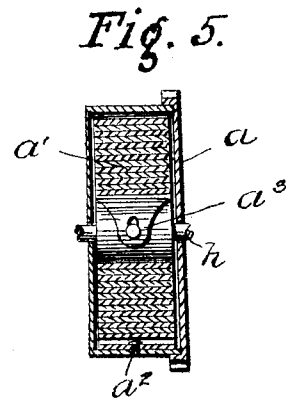
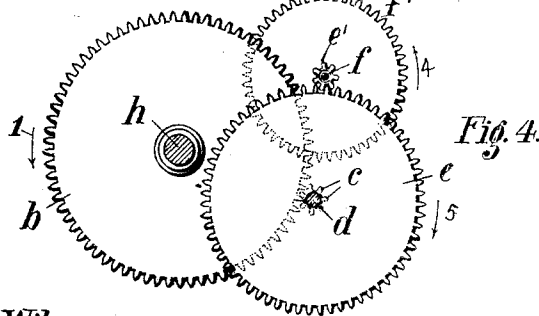
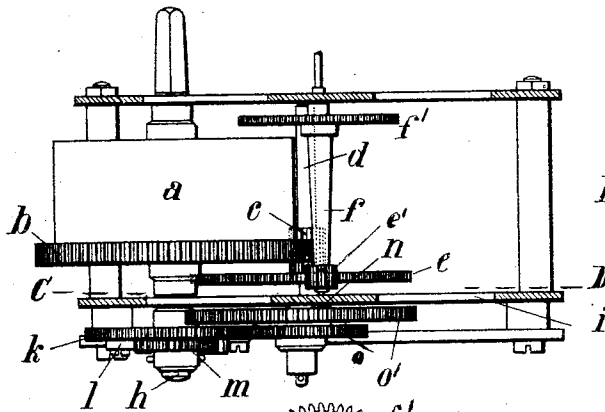
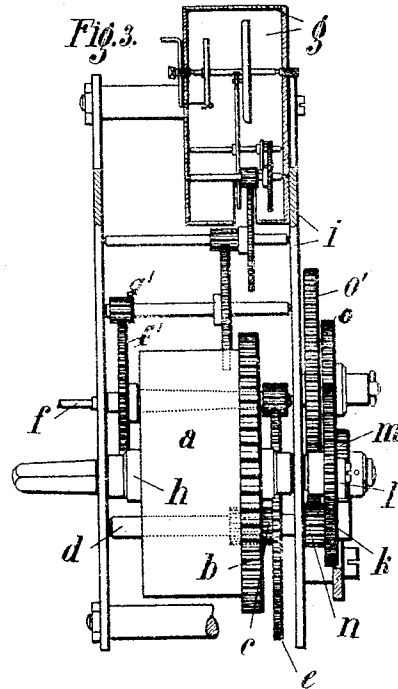
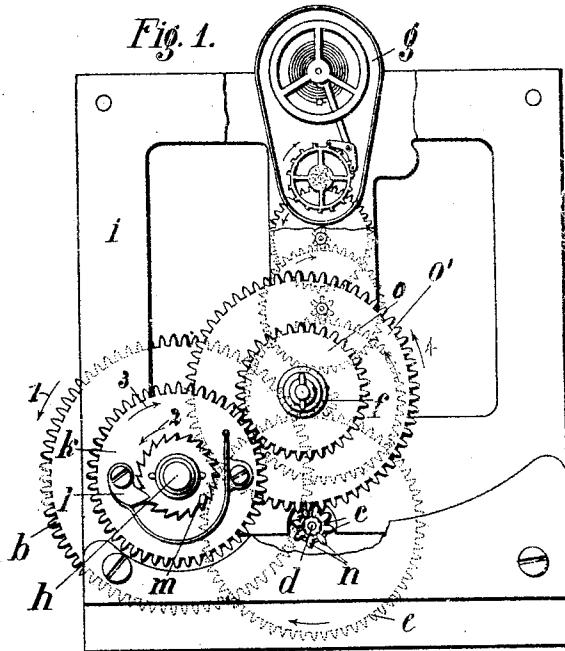


J. BÜHLER.
CLOCK AND THE LIKE.
APPLICATION FILED OCT. 3, 1907.

942,374.

Patented Dec. 7, 1909.



Witnesses

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CLOCK AND THE LIKE.

942,374.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed October 3, 1907. Serial No. 395,710.

To all whom it may concern:

Be it known that I, JOSEF BÜHLER, a subject of the King of Prussia, residing at Freiburg, Silesia, German Empire, have invented certain new and useful Improvements in Clocks and the Like, of which the following is a specification.

My invention relates to means for driving the mechanism of clocks or the like, and has for its general object to provide means whereby the driving mechanism of clocks will be made to operate more steadily and smoothly than in clocks as heretofore constructed.

In the spring-driven clocks as heretofore constructed, the power of the main spring has been given off by the unwinding thereof from its outer end only, and in the operation of such springs, the layers were liable to stick either by friction one upon the other, adhesion due to close contact, or to the cohesion of lubricants, so that the power was not always given off steadily or smoothly, but was sometimes intermittent or jerky.

It is the special object of my invention to obviate these difficulties and cause the motor to act uniformly and without shocks at all times.

With this object in view, my invention consists in the improved construction, arrangement and combination of parts of a device of this class which will now be fully described, and afterward specifically claimed.

I have illustrated an embodiment of my invention in the accompanying drawing, in which—

Figure 1 is a rear elevation of the clock-work, parts of the frame and casing being removed. Fig. 2 is a plan view. Fig. 3 is a side elevation. Fig. 4 is a vertical section on the line C—D of Fig. 2, showing the gearing, and Fig. 5 is a diametrical sectional view of the spring with its arbor and barrel.

Like reference characters mark the same parts in all of the figures of the drawings.

Referring specifically to the drawings *a* indicates the cylinder or barrel in which the main spring *a'* is housed, as is usual, said barrel being loosely mounted on an arbor *h* which is journaled to rotate in the frame of the works, the spring being secured at its outer end to the barrel *a* in any usual

manner, as at *a²*, and the harbor *h* at its inner end, as at *a³*.

The spring is wound up in the usual manner by turning its arbor *h* in the direction of the arrow 2 of Fig. 1, by means of a key, and held from unwinding by means of a spring-pressed pawl *l* pivoted on a gear *k* mounted loosely on the harbor *h*, the pawl engaging the teeth of a ratchet wheel *m*, rigidly secured on the harbor *h*.

The barrel *a* is provided with a toothed rim *b* forming a gear wheel, which meshes with a pinion *c* on an arbor *d*, Fig. 4, which carries a gear wheel *e*, which meshes with a pinion *e'* on an arbor *f*, which, for the purposes of this specification, I shall designate the "clock-work driving arbor."

The gear wheel *k*, on the arbor *h*, meshes with a gear *o* on an intermediate shaft which also carries a gear *o'* which meshes with a pinion *n* on arbor *d*.

From the foregoing it will be seen that when the spring is wound up, its tendency to unwind at its outer end, in the usual manner, will be exerted to turn the barrel *a* and toothed rim *b* in the direction of the arrow 1 of Fig. 4, which, through the gearing *e*, *e'*, and *o'*, would tend to turn the clock work driving arbor *f* in the direction of the arrow 4 of Fig. 4.

It will further be seen that owing to the fact that the arbor *h* is not held against turning, the tendency of the spring to unwind at its inner end will be exerted to turn said arbor in the direction of the arrow 3 of Fig. 1, or in the direction opposite to that of the barrel *a*. This would tend, through the gears *k*, *o*, and *o'* and pinion *n*, to turn the arbor *d* in the direction of the arrow 5 of Fig. 4, and the clock work driving arbor *f* in the direction of the arrows 4, 4 of Figs. 1 and 4, which is the same direction as the said arbor *f* is turned by the rotation of the barrel *a* due to the unwinding of the spring at the outer end, as before described.

The fact is obvious from the foregoing that the barrel *a*, which is turned in one direction by the unwinding of the spring at its outer end, cannot turn except when the arbor *h* turns in the opposite direction, due to the unwinding of the spring at its inner end, the barrel being connected by direct gearing with arbor *d*, and the arbor *h* being connected with the same arbor *d* by indirect

gearing. The power of the spring is therefore exerted at both its inner and outer ends to turn the arbor *d* in one and the same direction, and the arbor *d* is directly geared 5 with the clock-work driving arbor *f*. This arrangement will cause the spring to unwind uniformly at all times and prevent the objectionable sticking of the layers and the consequent jerky movement or sudden shocks 10 when the stuck layers come apart or start again to unwind.

A gear wheel *f'* on the arbor *f* meshes with a pinion *g'* which latter is the first of a train of gearing to operate the hand and 15 escapement mechanisms, which are of any ordinary or approved construction, and in this instance are inclosed in a casing *g*.

The gear *k* and ratchet wheel *m* are mounted on the spring arbor *h*, outside of 20 the back plate *i* of the frame.

Having thus fully described my invention, what I claim as new is:

1. The combination in a driving mechanism for clocks, of a mainspring, a clock- 25 work driving arbor, means whereby said arbor is actuated by the unwinding of the outer end of the spring, and means whereby said driving arbor is simultaneously actuated in the same direction by the unwinding 30 of the inner end of the spring, substantially as described.

2. The combination in a driving mechanism

for clocks, of a frame, an arbor journaled in the frame, a barrel loosely mounted on the arbor, a mainspring secured at its 35 inner end to the arbor and at its outer end to the barrel, an arbor connected with the hand and escapement mechanism, direct gearing connecting the barrel with said second arbor, and indirect reversing gearing 40 connecting the spring arbor with said second arbor, substantially as described.

3. The combination in a driving mechanism for clocks, of a frame, an arbor journaled in the frame, a barrel loosely mounted 45 on the arbor, a mainspring secured at its inner end to the arbor and at its outer end to the barrel, a clock-work driving arbor, a toothed rim on the barrel, a second arbor, direct gearing connecting said second arbor 50 with the toothed rim, a gear loosely mounted on the spring arbor, ratchet mechanism connecting it with the spring arbor, a gear on the driving arbor, intermediate gearing connecting the last named gear with the second 55 arbor, and gearing connecting the second arbor with the clockwork driving arbor, substantially as described.

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

JOSEF BÜHLER.

Witnesses:

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