No. 805,436. PATENTED NOV. 28, 1905.

L. AURNHAMMER.

METRONOME.

APPLICATION FILED SEPT. 27, 1904.

Fig: 1.

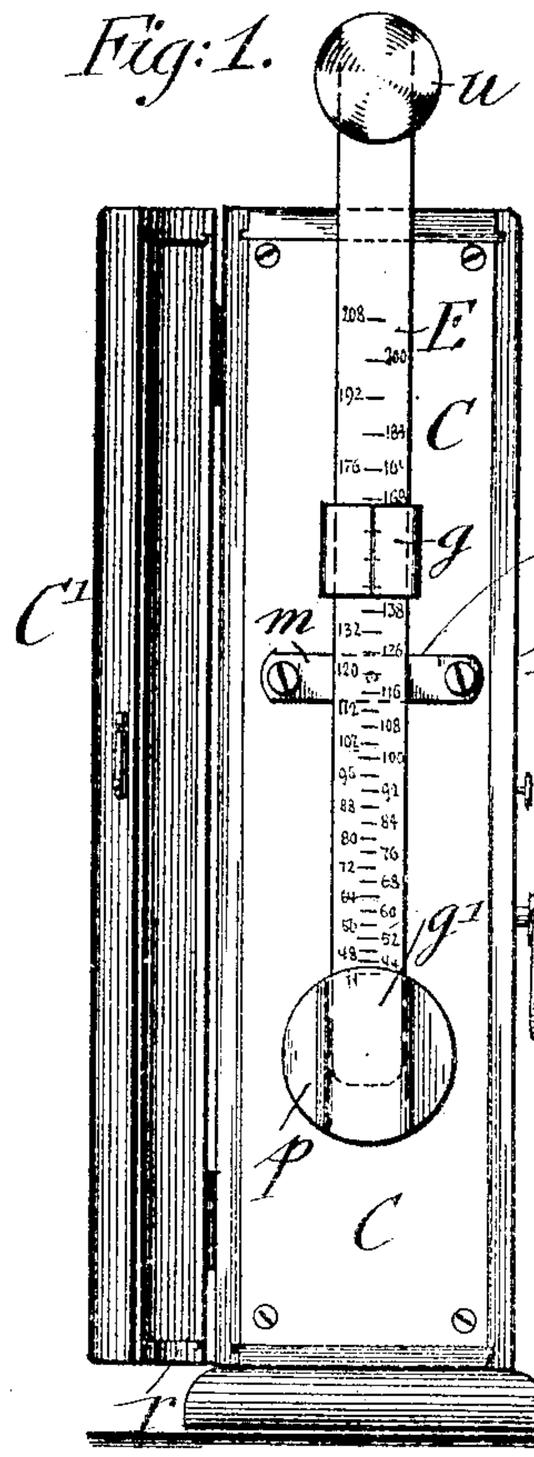


Fig: 2.

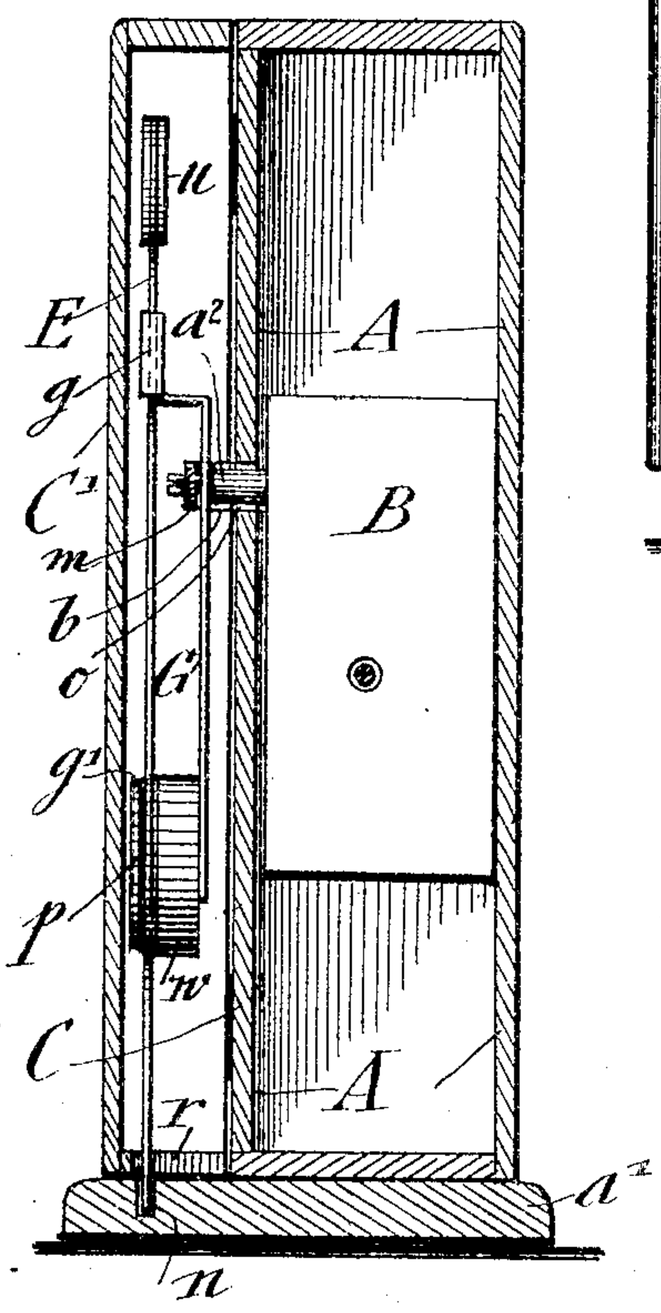


Fig: 4.

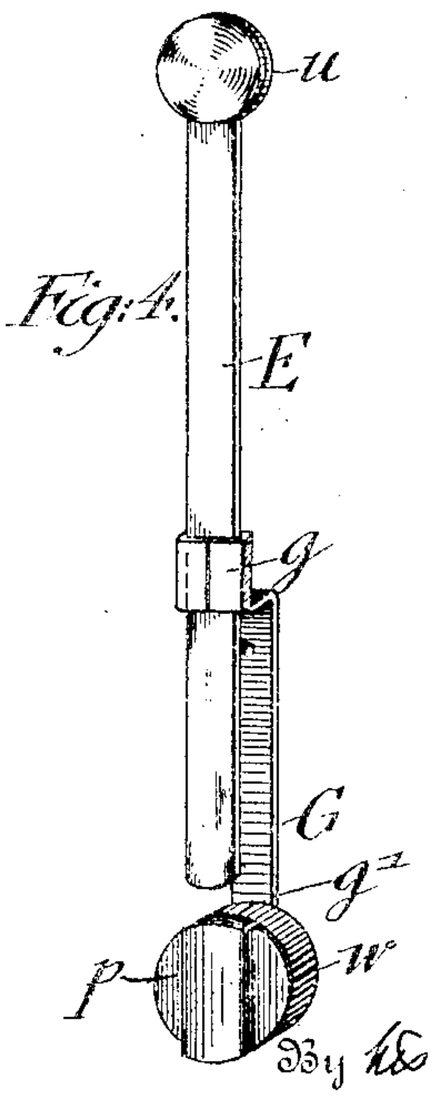
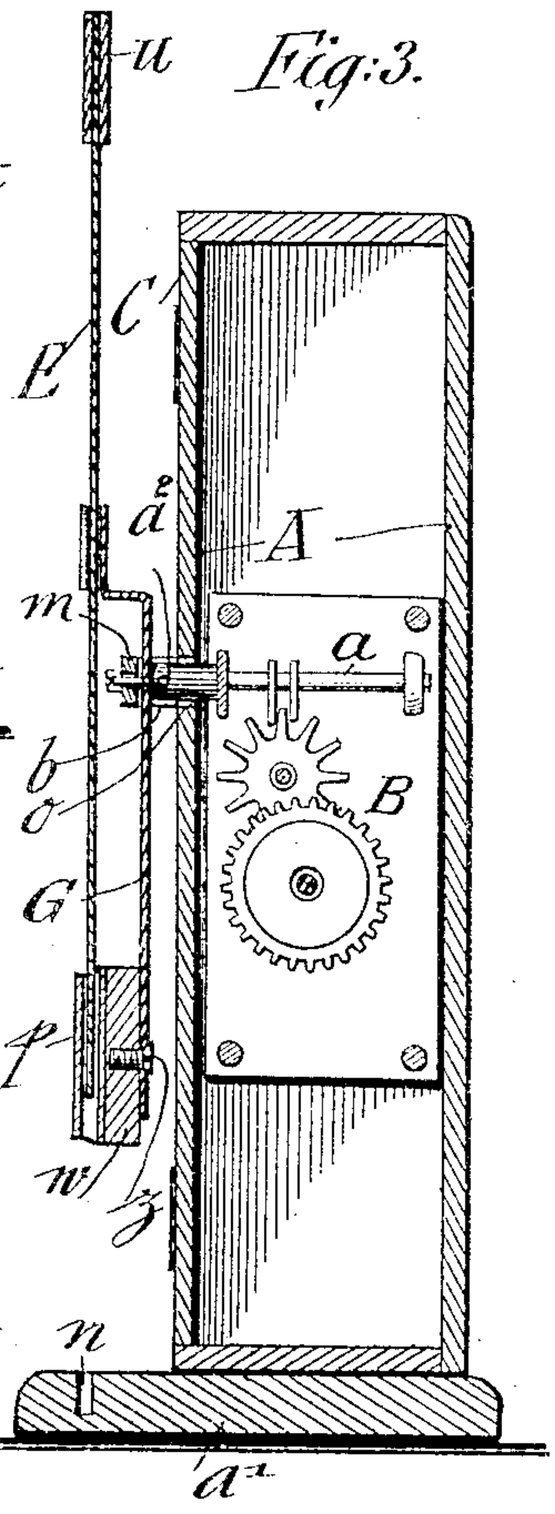


Fig: 3.



Witnesses
Henry J. Sulzbier.
Frank E. Boyce.

Inventor
Ludwig Aurnhammer
By his Attorneys Howson & Sons

UNITED STATES PATENT OFFICE.

LUDWIG AURNHAMMER, OF WEST HOBOKEN, NEW JERSEY.

METRONOME.

No. 805,436. Specification of Letters Patent. Patented Nov. 28, 1905.

Application filed September 27, 1904. Serial No. 226,124.

To all whom it may concern:

Be it known that I, LUDWIG AURNHAMMER, a citizen of the Empire of Germany, residing in West Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Metronomes, of which the following is a specification.

The object of the present invention is the provision of a metronome which by virtue of the compactness with which the operative parts are arranged can be conveniently carried in the pocket and readily set into motion so as to mark the time from a low to a very high number of beats per minute.

The invention also contemplates the provision of a metronome embodying an extensible pendulum which may be adjusted with greater facility than the metronome-pendulums now in use; and with these and other ends in view the invention consists in the novel features and combinations of parts to be fully described hereinafter, and finally recited in the appended claims.

In the accompanying drawings, illustrative of one embodiment of the invention, Figure 1 is a front elevation of the improved metronome, showing the pendulum in extended and operative position. Fig. 2 is a vertical longitudinal section showing the instrument in closed position with the cover closed. Fig. 3 is a vertical central longitudinal section of the metronome in the position shown in Fig. 1, and Fig. 4 is a detail perspective of the pendulum shown as removed from the metronome-arbor.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, A denotes the casing or housing of the improved metronome, which is made of wood or other suitable material, preferably in the shape of a rectangular box, as shown, it being of such size as to permit of its insertion into an ordinary garment-pocket. The driving mechanism B, which may be of any preferred type and which forms no part of the present invention, is inclosed in the casing A, the only protruding parts being the winding device *d*, the arbor *a*, and the first journal-bearing for the latter, which is formed in a cross-bar *m*, attached at both ends to supporting-bars *b*, which are attached in any suitable manner to the frame of the driving mechanism and which extend through an opening *o* in the removable front wall C of the casing, as shown in Figs. 1 and 2. The base *a'* of the casing extends beyond the front wall C, so that in connection with a cover C', which is hinged to the casing at one side of the front wall, the pendulum can be completely inclosed when not in use. The cover C' is provided with inwardly-extending top, side, and bottom walls, which abut against the front wall C when the cover is in closed position and allow sufficient space between the outer wall of said cover and said face for the pendulum of the instrument. The bottom wall of the cover C', which when said cover is in closed position is in contact with the forward extension of the base *a'*, is provided with a recessed portion *r* for permitting the lower end of adjustable member of the pendulum to be moved into a transverse notch *n* in said extension, so as to properly lock the pendulum in inoperative position when the metronome is carried in the pocket.

The pendulum of the improved metronome which forms the primary subject-matter of the present invention is composed of two members, a weighted guide member G and a graduated adjusting member E, which is slidable in said guide member. The latter is preferably formed from a strip of metal which is secured near its upper end to the arbor *a* between the cross-bar *m* and a collar a^2 on said arbor, the upper terminal portion being offset in a forward direction, as shown in Fig. 2, and having lateral portions which are bent forwardly and inwardly, so that their extremities abut and form a guide-sleeve *g* at the upper end of the guide member slightly above its connection with the arbor *a*. At the lower front end of the strip a weight *w* is attached by means of a screw *z* or in any suitable manner. This weight is calculated to properly counterbalance the actuating mechanism and, as shown, is of disk shape, being provided with a front plate *p*, having an outwardly-bent part forming a vertical guide-sleeve *g'* in alinement with the upper guide *g*. The adjusting member E is movable in the guides *g* and *g'* and consists of a strip of spring-steel or other resilient material, which is provided throughout the greater portion of its length with graduations giving the number of oscillations or beats per minute and, if desired, with the designations "Andante," &c. (Not shown.) The value of these graduations increases from the bottom portion of the member E toward the top thereof, and in

the construction shown said graduations are designed to register with the upper edge of the guide-sleeve *g*, although it is obvious that any similar point could be used if the graduations on the adjusting member were correspondingly changed. A smaller counterweight *u* is attached permanently to the upper terminal portion of the adjusting member E in any suitable manner, so as to facilitate the adjustment of the latter, the friction between the upper guide *g* and said member being sufficient to hold the latter in position to which it has been adjusted in the guides. The counterweight *u*, together with the adjustment of the member E, produces the proper actuation of the pendulum in connection with the actuating mechanism and counterbalancing-weight *w*.

The tranverse notch *n* in the extension of the base is vertically below the lower terminal of the adjusting member E, so that by pushing the latter in downward direction it engages said notch and is retained therein, as shown in Fig. 1. The recess *r* in the bottom wall of the cover C permits the downward passage of the adjusting member, so that it may engage the notch *n*, as has been described.

The operation of the improved metronome is as follows: When the time to be indicated is very rapid, the adjusting member E is moved upwardly from the position shown in Fig. 1 until one of the graduations at the upper portion of the member E registers with the upper edge of the upper guide-sleeve *g*. The actuating mechanism is then wound up, and the pendulum is then set in motion, after which the actuating mechanism continues the movement of the same. As the beats of the pendulum are very short in this position the number of beats per minute will be comparatively high. When it is desired to reduce the number of beats per minute, it is only necessary to move the adjusting member E, by means of the counterweight *u*, in upward direction, whereby the arc described by the weight *u* is more and more lengthened by each upward adjustment, the load on the actuating mechanism is increased, and the speed of the pendulum correspondingly decreased, as will be readily understood. The range of the instrument illustrated is from forty to two hundred and eight oscillations or beats per minute.

When the pendulum is pushed downward into the bottom notch and the cover is closed, the improved metronome occupies a very small space and can be conveniently carried in the pocket. When the pendulum is in full extended position, it extends a comparatively great extent above the top of the casing A and is entirely withdrawn from the lower guide, the friction of the upper guide-sleeve being sufficient to prevent displacement. It furnishes in the extended position all the different beats required by the different tempo of the pieces of music to be played. The improved metronome also has the advantage that its adjustment of the pendulum can be accomplished with great facility to the number of beats required and that owing to the small number of parts employed it may be readily and cheaply manufactured.

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

1. In a metronome, the combination of an actuating mechanism, an arbor driven by the same and an extensible pendulum, comprising a weighted guide member attached to the end of said arbor and having alined terminal longitudinally-disposed guides, and an adjusting member movable in said guides, said adjusting member being provided with a fixed counterweight and having graduations extending from the lower toward the upper end for registering with the edge of the upper guide.

2. In a metronome, the combination of an actuating mechanism, an arbor driven by the same, and an extensible pendulum, comprising a guide member attached to said arbor, a guide-sleeve on the upper end of said member, a weight attached to the lower end of said guide member, said weight being provided with a guide, alined with the upper guide-sleeve, and a graduated adjusting member movable in said guides and provided with a fixed counterweight.

3. In the metronome, the combination of a casing having a forwardly-extending base provided upon the upper surface of its extension with a recess or notch, an actuating mechanism in said casing, an arbor driven by the same, and an extensible pendulum attached to the end of said arbor, said pendulum comprising a weighted guide member and an adjusting member, provided with a fixed counterweight at its upper end, the adjusting member being vertically in line with said notch and adapted to be retained by said notch when in inoperative position.

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

LUDWIG AURNHAMMER.

Witnesses:

PAUL GOEPEL,

HENRY J. SUHRBIER.