J. A. HECKENBACH.

Metronomes.

No. 136,435. Patented March 4, 1873.

Fig. 1

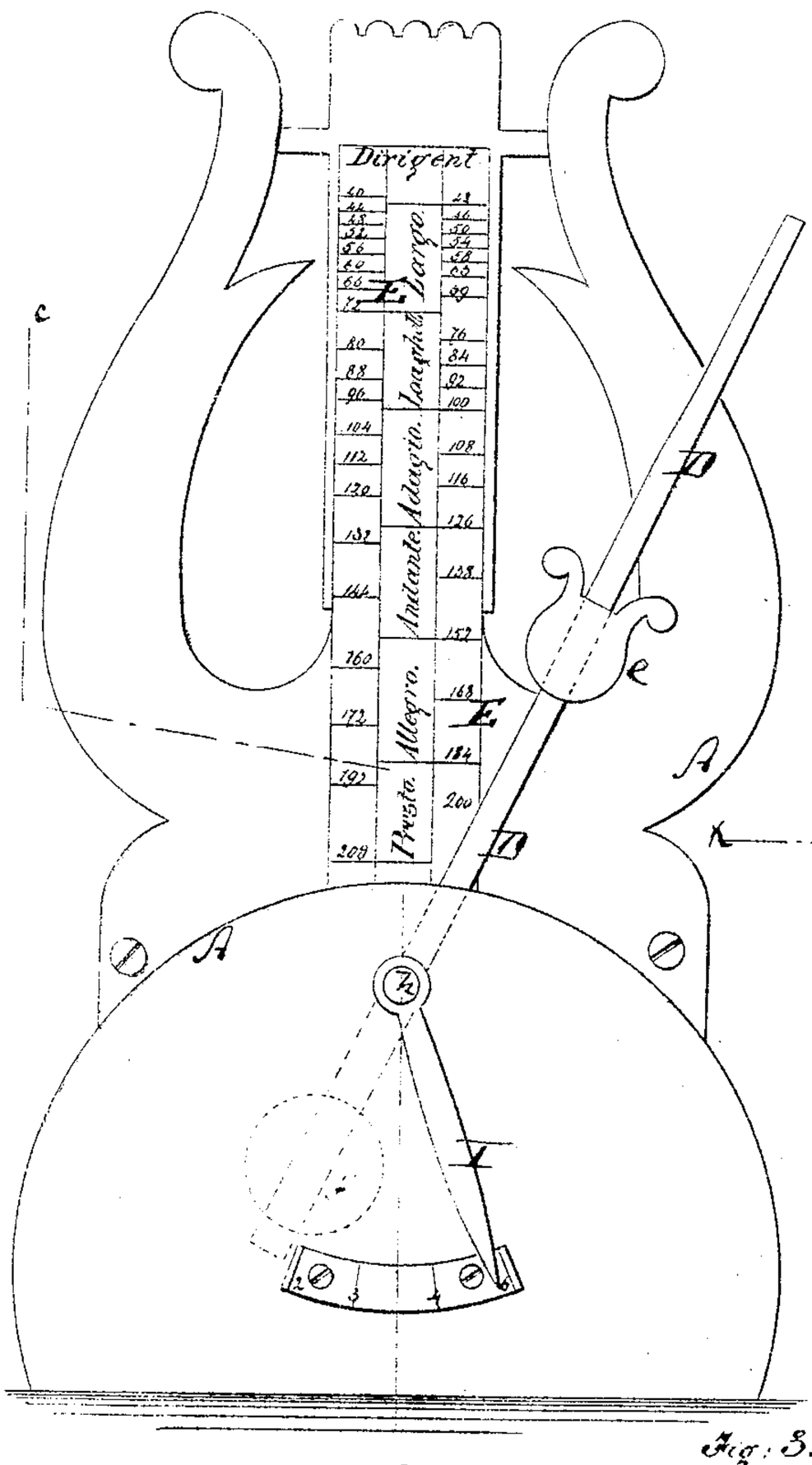


Fig. 4

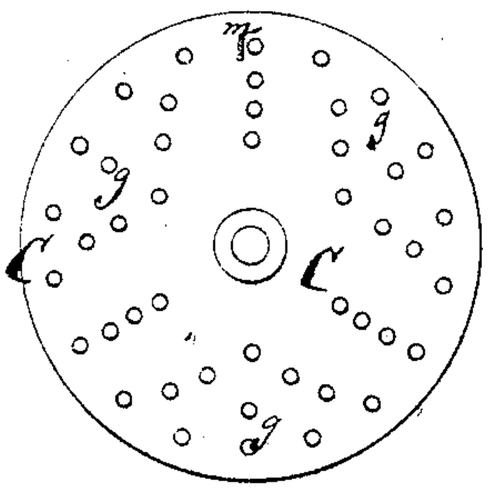


Fig. 2

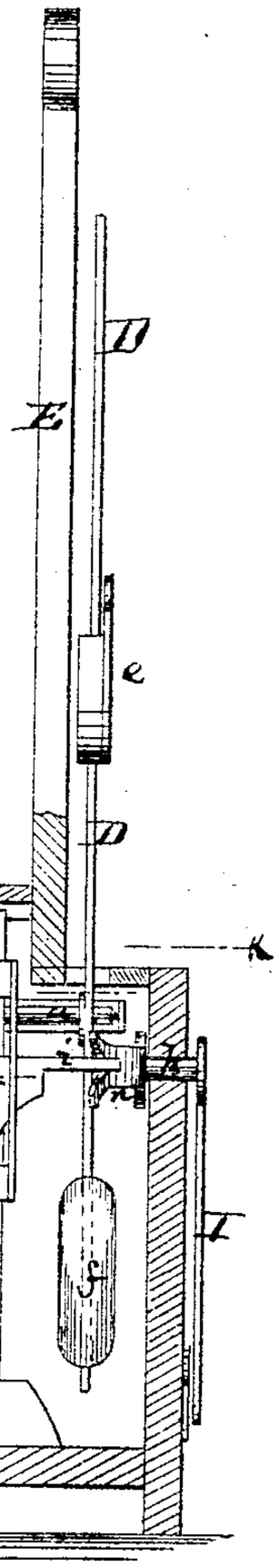
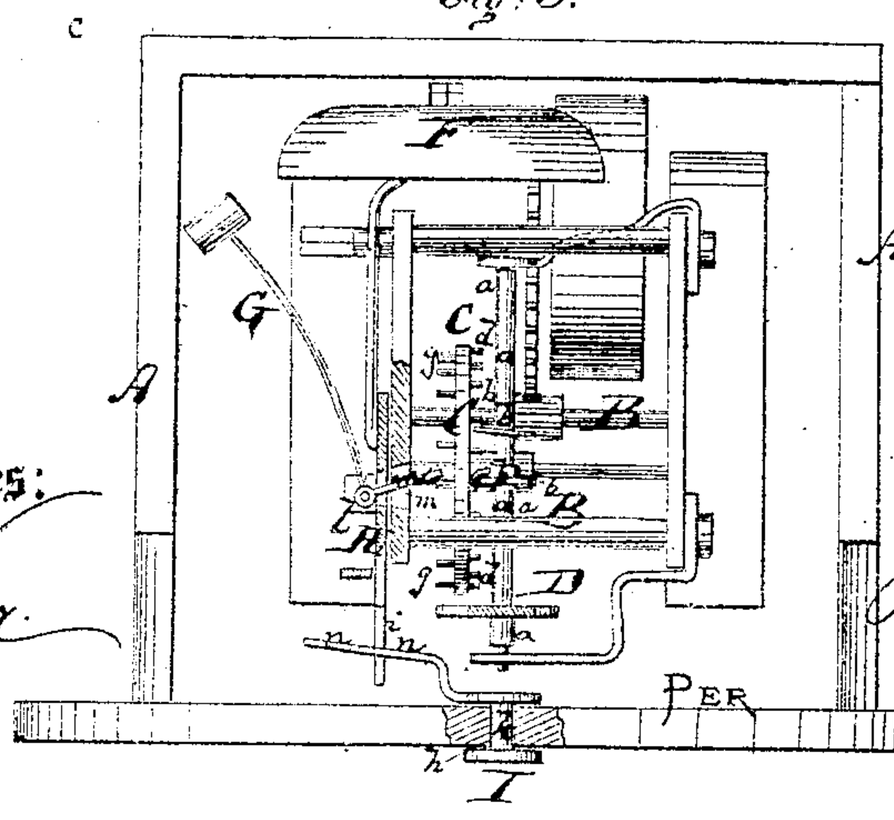


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN A. HECKENBACH, OF MAYVILLE, WISCONSIN.

IMPROVEMENT IN METRONOMES.

Specification forming part of Letters Patent No. **136,435**, dated March 4, 1873.

To all whom it may concern:

Be it known that I, JOHN AD. HECKENBACH, of Mayville, in the county of Dodge and State of Wisconsin, have invented a new and Improved Music Time-Indicator, of which the following is a specification:

In the accompanying drawing, Figure 1 is a front elevation of my invention. Fig. 2 is a vertical section thereof taken on the line C C, Fig. 1. Fig. 3 is a horizontal section on the line K K, Fig. 2. Fig. 4 is a face view of the escapement-wheel and concentric rings of pins *g*.

Similar letters of reference indicate corresponding parts.

This invention relates to a new instrument for keeping the time during musical performances or exercises; and consists in such an arrangement of clock-work, and connection thereof with an adjustable index-hand, that a suitable number of vibrations of a pendulum can be produced, and from the pendulum a suitable number of strokes on a gong or bell. The pendulum vibrations are regulated by an adjustable slide on the pendulum-stem, and serve, by means of cams on the pendulum-pivot, to vary the speed of the rotating escapement-wheel, which wheel has projecting pins on one side for moving the clapper of the bell. The pins on the escapement-wheel are set in circles, with varying numbers in each circle; and the clapper can, by the aforementioned index-hand, be brought in line with either one of the circles, so that in a given speed of rotation of the escapement-wheel the number of bell strokes can still be varied. This latter adjustment is for the purpose of giving the 6th, 4th, or other subdivisions of measure.

In the accompanying drawing, the letter A represents the containing-box of the instrument. Within the same is the clock-work B, whose train is worked by a spring-weight or other means, and serves to impart rotary motion to a disk or wheel, C. This disk is the escapement-wheel of the clock-work. D is the pendulum mounted upon a pivot, *a*, which pivot extends laterally through the frame-work, and upon this pivot are mounted two cams, *b b*, which are notched and bear against the pins *d* that project in a circle from one face of the escapement-wheel C. The spring power applied to the escapement-wheel is, by the pins *d*, caused to bear against the cams *b*, and serves to keep the pendulum in vibration. The pins *d* pass successively through the notches of the cams, thereby allowing the intermittent rotary motion of the escapement-wheel. By means of a slide, *e*, which can be set up and down on the pendulum-rod, the vibrations of the latter can be regulated to produce a greater or less speed in the usual manner. The pendulum swings in front of a graduated index-plate, E, fully shown in Fig. 1, and the slide *e*, when set opposite the figures marked on said index, will cause the requisite number of vibrations—from forty to two hundred and eight per minute—to be produced. The pendulum-stem projects, as usual, considerably above its pivot *a*, the slide *e* being on this upper portion. The pendulum-ball *f*, at the lower end of the pendulum-stem, can also be adjusted up and down, if necessary, for regulating the operations with the utmost accuracy. Opposite to the pins *d* project from the escapement disk C other pins *g*, which are arranged in concentric circles, as is clearly shown in Fig. 4. The outer circle of pins *g* contains more pins than that next to it; this again more than the one nearer the center, &c., there being preferably four such circles of pins. F is a bell fastened to a slide or plate, H, which is arranged at the side of the clock-work B, and which can be set up or down at will by connection with an index-hand, I, which is pivoted to the face of the frame or case A. A forked arm, *n*, extends from the pivot *h* of the index-hand, and straddles a pin, *i*, or arm of the plate H, so that the latter will be set up and down whenever the index-hand I is swung on its pivot. G is the clapper to the bell F. It is pivoted to the slide H and connected with a spring, *j*, which tends to throw it against the bell. From the pin *l*, by which the clapper is pivoted to the plate H, projects an arm or crank, *m*, toward that face of the escapement-disk which has the pins *g*. In fact, the crank will be in the way of these pins *g*.

By setting the slide H higher or lower by means of the index I, the crank *m* can be brought in line with either of the circles of pins *g*, so that the vibrations of the clapper during a given number of vibrations of the pendulum can be regulated at will. Thus, if the crank *m* is brought under the action of the

outermost circle of pins, which, say, contains eighteen pins, *g*, the clapper will be moved eighteen times during one rotation of the disk C; while if the crank is brought in action with the innermost circle of pins *g*, which has, say, six pins only, the clapper will be struck but six times during the same number of vibrations of the pendulum that formerly produced eighteen strokes by the bell. In this manner the subdivisions of measure to seconds, thirds, fourths, and sixths, &c., can be produced. It is evident that each pin *g*, as it strikes the crank *m*, lifts the clapper of the bell, while, as soon as such pin relieves the crank *m*, the spring *j* forces the clapper violently against the bell. By this instrument, therefore, the player will be guided entirely by the strokes of the bell, and not, as hitherto, by the ticks of the pendulum only.

The most important feature of the invention is the adjustability of the strokes of the bell during a given number of pendulum vibrations.

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

1. The escapement-wheel C provided with the pins *d* on one side and with the circles of pins *g* on the other side, as specified.

2. The combination of the pivot *a* and cams *b* with the escapement-wheel C and pins *d* thereon, to operate substantially as herein described.

3. The slide H, clapper G, and bell F connected with each other, as set forth.

4. The index-hand I having the forked arm *n* and connected with the slide H to move the same up and down, as set forth.

5. The combination of the clapper G and crank *m* with the escapement-wheel C and pins *g* thereon, substantially as specified.

6. A musical indicator provided with a bell whose strokes differ from the vibrations of the pendulum in the desired ratio, as set forth.

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Witnesses:

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