

J. P. L. LINDSTRÖM.
STRIKING MECHANISM FOR CLOCKS AND THE LIKE.
APPLICATION FILED SEPT. 29, 1900.

900,399.

Patented Oct. 6, 1908.

FIG. 1.

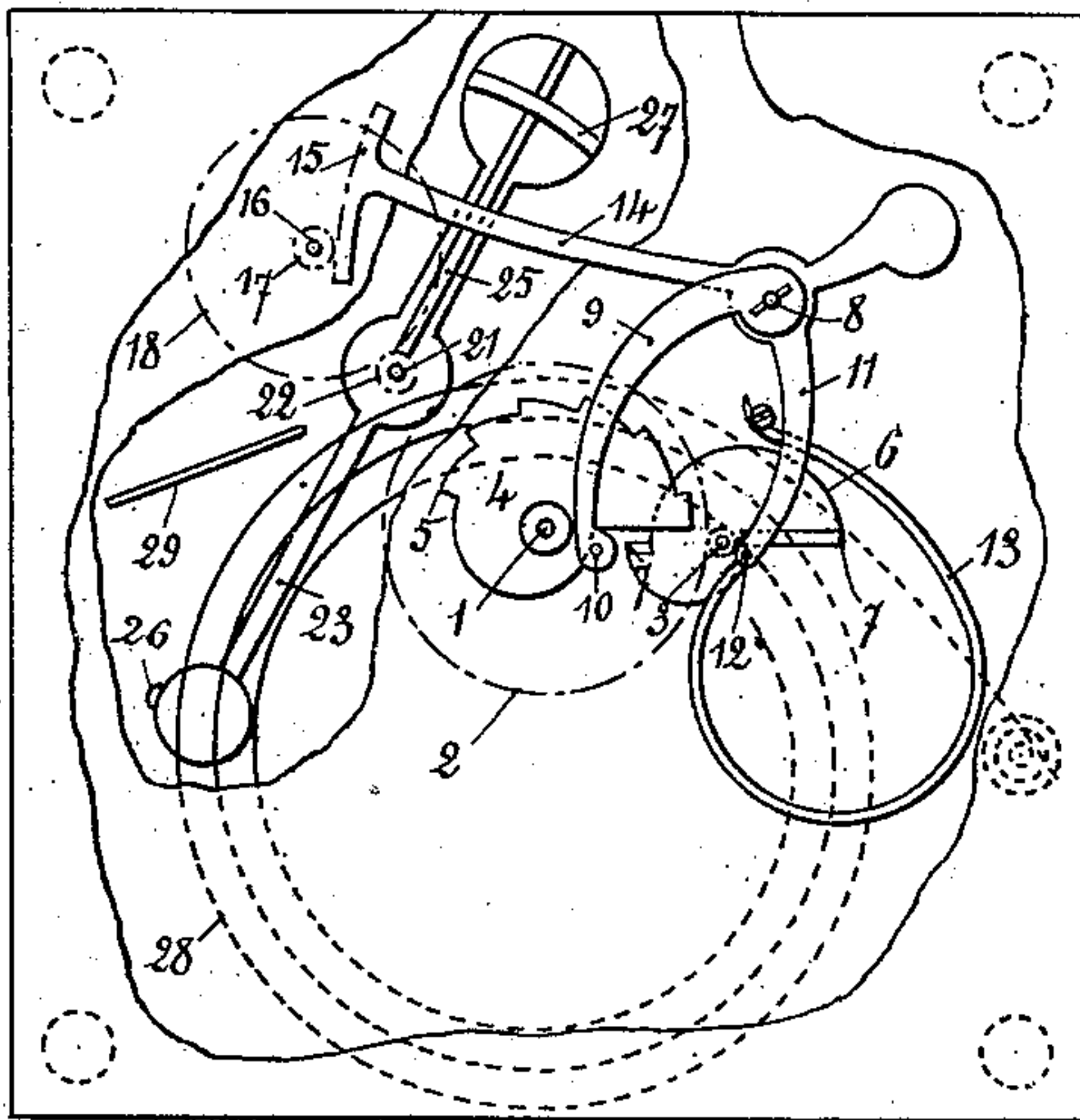


FIG. 3.

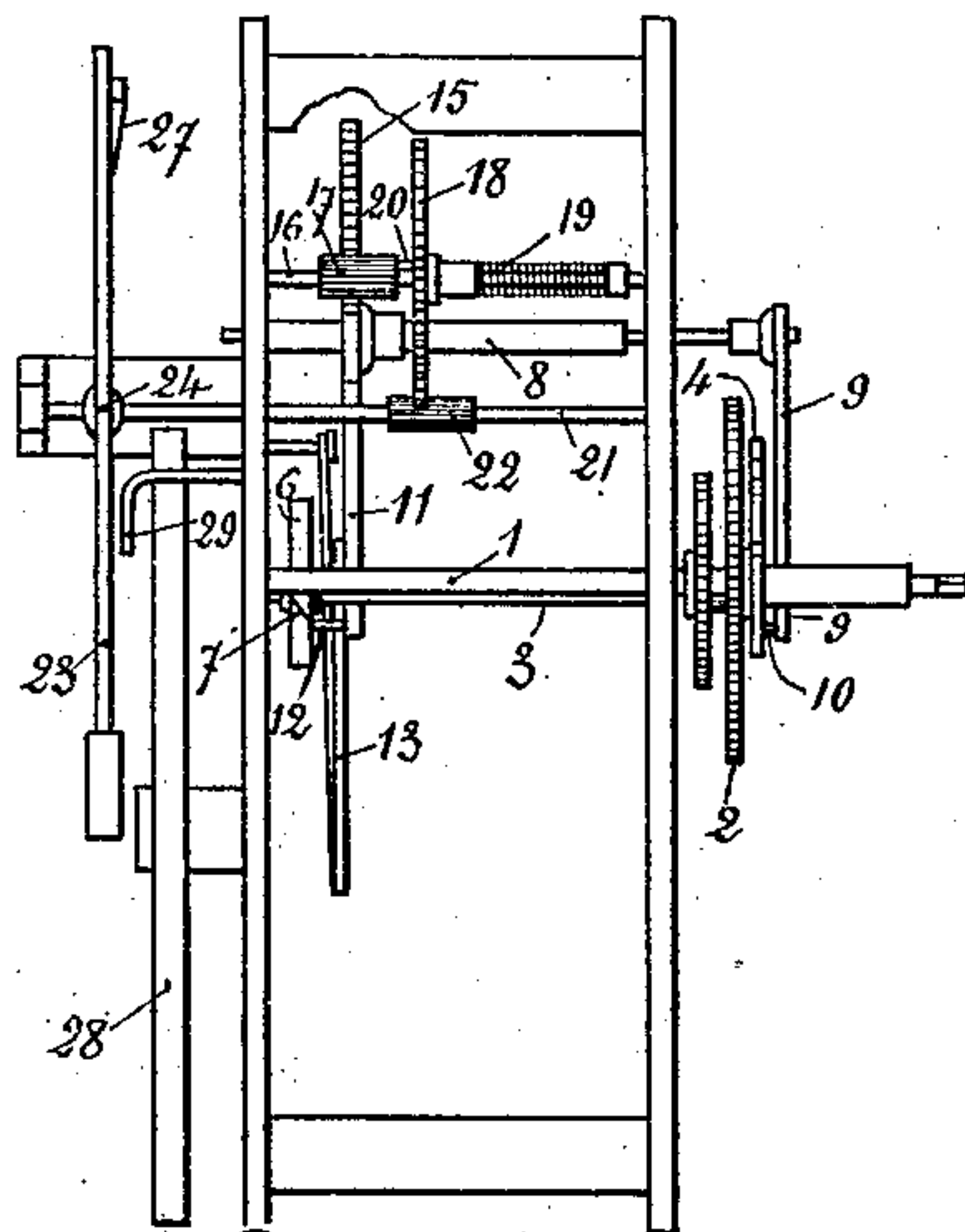


FIG. 2.

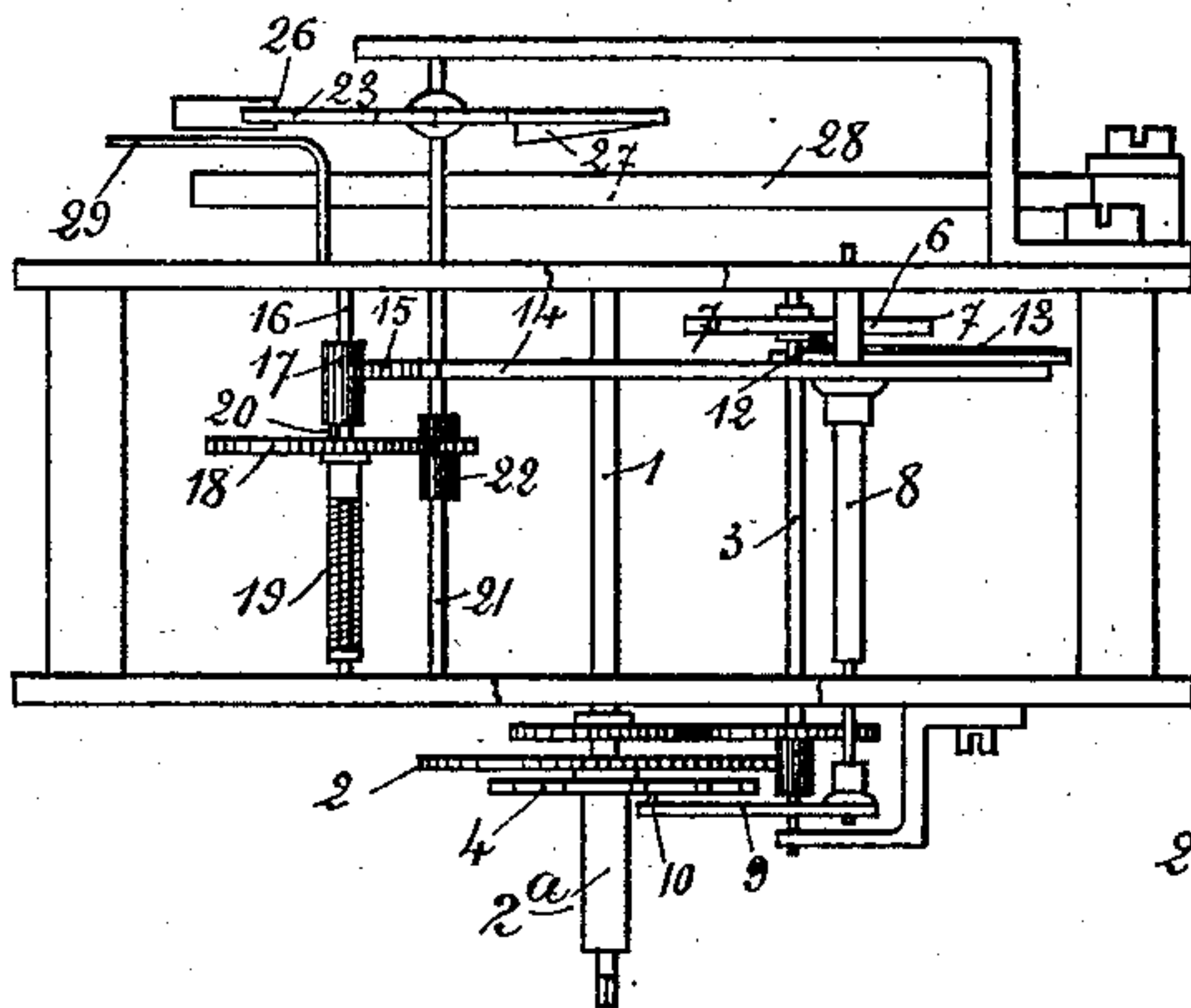


FIG. 5.

FIG. 4.

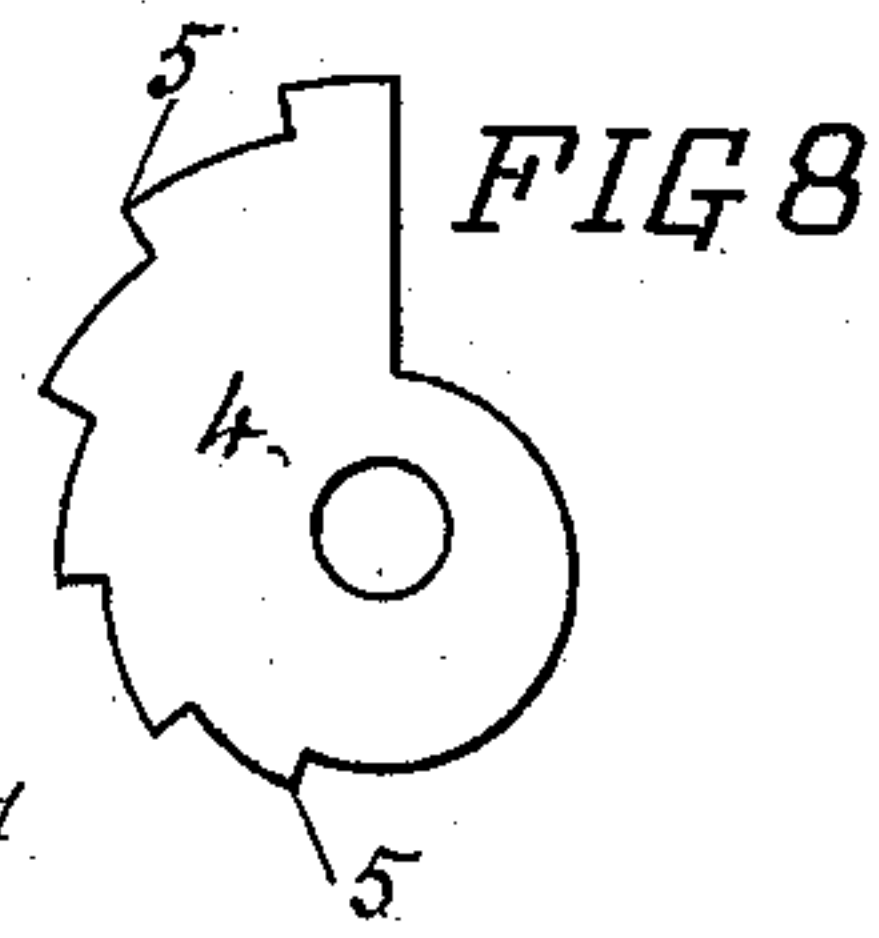
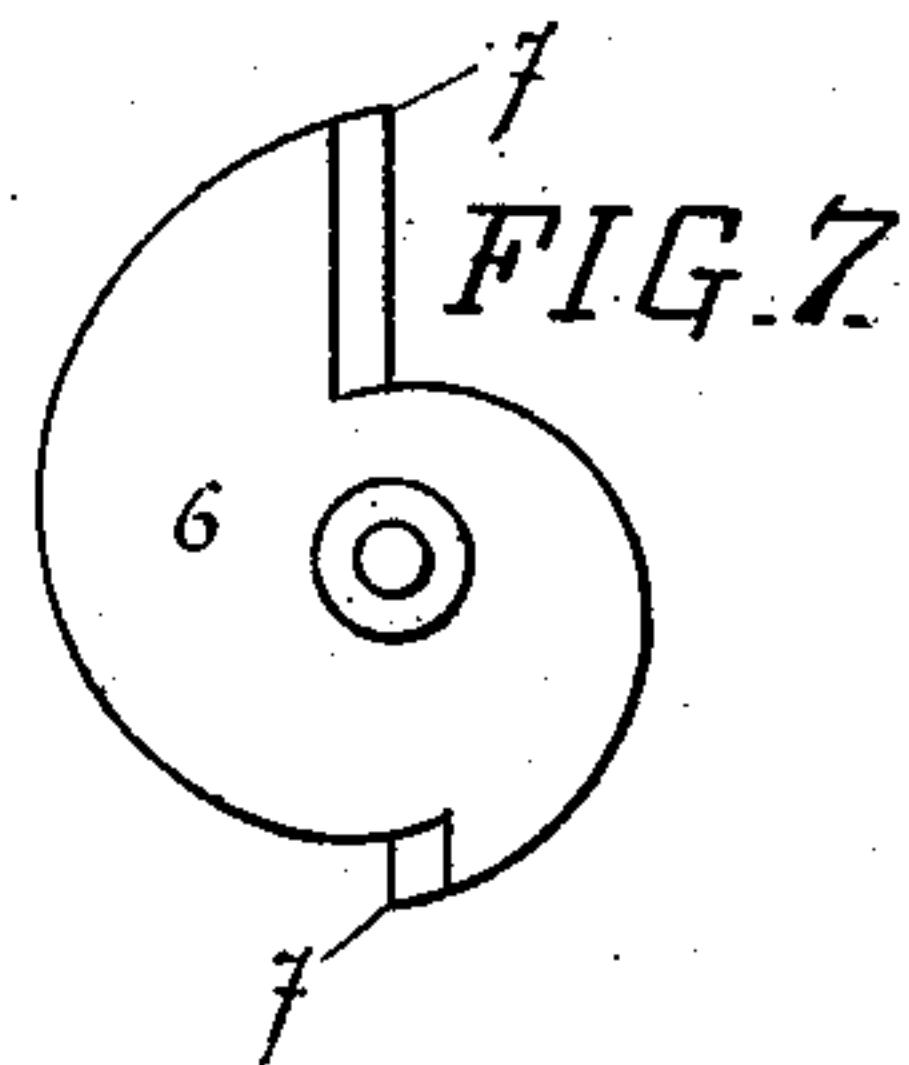
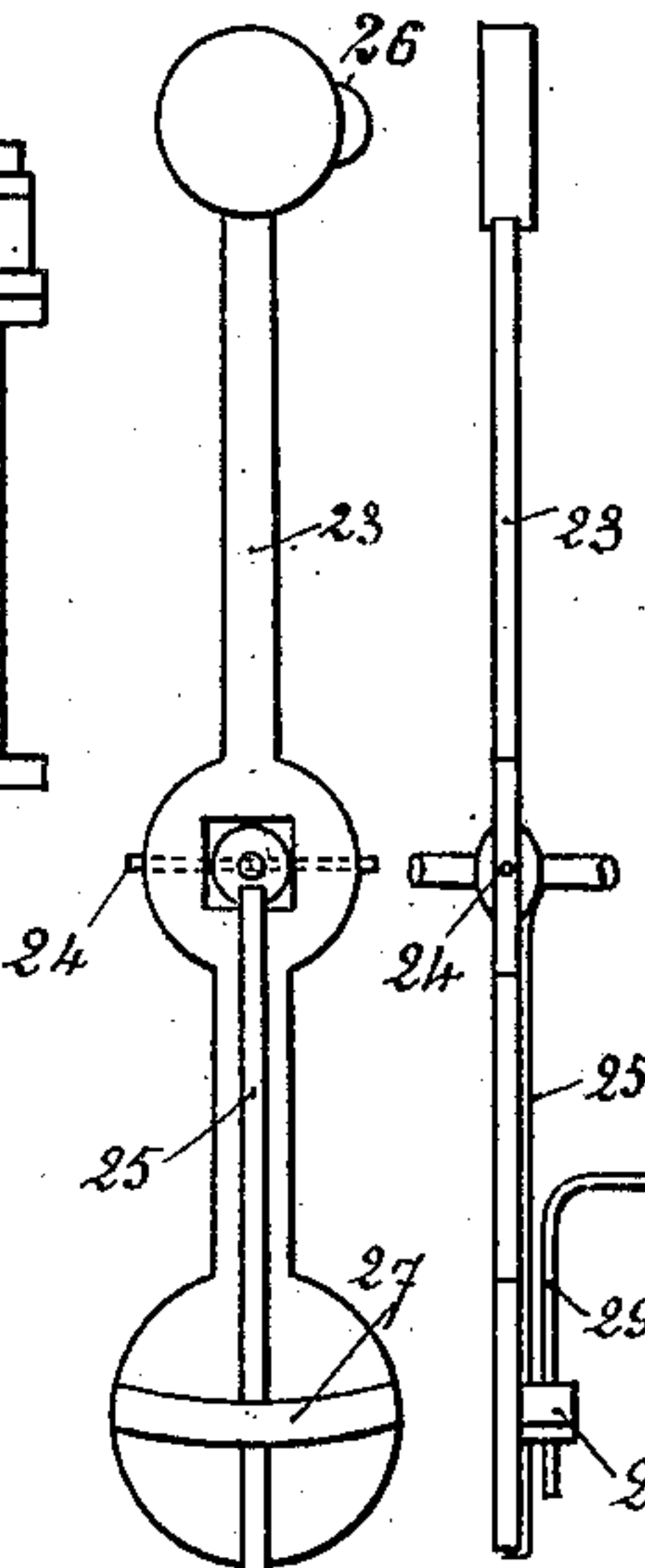
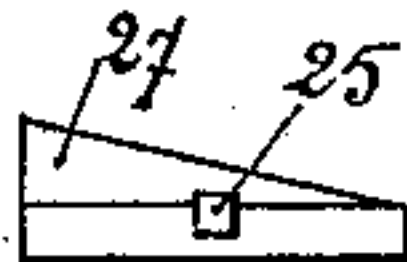


FIG. 6.



Witnesses
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STRIKING MECHANISM FOR CLOCKS AND THE LIKE.

No. 900,399.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed September 29, 1900. Serial No. 31,557.

To all whom it may concern:

Be it known that I, JÖNS PETER LARSSON LINDSTRÖM, a Swedish subject, residing at 156 Faubourg St. Martin, in Paris, in the Republic of France, watchmaker, have invented certain new and useful Improvements in Striking Mechanism for Clocks and the Like, of which the following is a specification.

The present invention relates to a new striking mechanism for clocks and all kinds of apparatus such as signals, telegraphs etc., where this mechanism may be suitably applied to either alone or in combination with any other device already known.

The present invention is based on principle of a balanced and revolving hammer deviating from its plane and actuated by suitable means.

This invention is intended to simplify the striking apparatus without doing away with the advantages heretofore known, in clocks for instance, such as use of the main motion barrel for actuating the striking mechanism and the possibility of turning the hands in either direction.

A preferred embodiment of my invention is illustrated in the accompanying drawings, wherein

Figure 1 is an elevation of my striking mechanism in a square clock frame, said frame being broken away at the back to exhibit certain parts behind it; Fig. 2 is a plan view of a clock provided with my invention and with certain parts of the time measuring mechanism removed for greater clearness; Fig. 3 is a side view thereof; Fig. 4 is an edge view of my revolving hammer for striking the gong; Fig. 5 is a face view thereof and Figs. 6, 7 and 8 illustrate the details.

The shaft which carries the minute hand is shown at 1 and is driven in any usual well known manner. The larger spur wheel 2 is fixed upon the usual sleeve for driving the hour hand. The shaft 3 produces the twelve to one ratio, for instance, between the shaft 1 and sleeve 2 in any well known manner, said shaft 1 being operated in the usual way by the time measuring parts of the clock. These are omitted as they form no part of my present invention and would only obscure the drawing.

Upon the sleeve of the wheel 2 there is fixed a snail cam 4, having appropriate

shoulders 5 over about 180 degrees of its periphery, the remainder of the circumference being cut upon a volute periphery as shown in Fig. 8. This cam may be appropriately called here the "hoursnail" and its form depends upon the division of time. A second snail cam 6 is fixed upon the shaft 3 which is driven by 1. This snail has but two shoulders 180 degrees apart, one of which is much deeper than the other and, as shown on Fig. 7, the forward face of each shoulder is beveled as at 7. It is obvious that the number of these shoulders depends upon the number of the strikes to be given during one hour. The shaft 8 is so mounted within the clock frame as to be capable of longitudinal motion a short distance, and outside of the frame or in another convenient place, said shaft carries an arm 9 having a pin 10 adapted to bear against the periphery of the snail 4. A second arm 11, which may well be termed a lifting arm, is also fast to said shaft 8 and carries a pin 12 adapted to bear against the periphery of the snail 6.

The spring 13 or its equivalent, acts to push the pin 12 and therefore the pin 10 also, to the left in Fig. 1, and is also normally set out of a plane, as shown in edge view on Fig. 3, whereby it has a tendency to pull the arm 11 and shaft 8 backward, or to the left in Fig. 3. Also fast to 8 is the operating arm 14, which is preferably in one piece with 11, as shown. At the end of this arm is a curved rack 15, meshing with the long pinion 17 on the shaft 16. This gearing admits of longitudinal motion of 14 and 15 with the shaft 8 as described below. Loose upon shaft 16 is the gear wheel 18 which is normally pushed against the side of the pinion 17 by the spring 19. (See Figs. 2 and 3).

Engagement between 17 and 18 is accomplished by the well known bevel clutch 20, which transmits rotatory movement contrary to the hands of the watch on Fig. 1, but when 17 is impelled oppositely, the clutch is inoperative. Many automatic one way clutches are well known which are suitable for this purpose, and I have indicated the simplest on the well known beveled pin 20. The effect of using this form of engagement between 17 and 18 is that, when the toothed sector 15 rises, the toothed wheel 18 is operated, but on contrary movement of the sector 15,

the clutch 20 is idle and no movement is imparted to the wheel 18. In this case the wheel 18 compresses the weak spring 19 until, when 17 comes to rest, this spring restores the clutch engagement at 20.

The striker shaft 21 is driven by means of the ordinary pinion 22, which is sufficiently long to permit of engagement with the gear 18, while allowing the latter the requisite longitudinal play. Upon the rear end of the shaft 21 is fixed the hammer 23. This hammer is mounted as shown in detail in Figs. 4 and 5. There the pin 24 affords a means for allowing the hammer 23 to turn with the shaft 21. At the same time 23 is free to swing upon said pin 24 in the plane of the shaft 21. The spring 25 is attached to said hammer 23 and rests upon the shoulder of the shaft 21, so that it always exerts a tendency to bring the hammer 23 back to a middle position, or at right angles to the shaft 21. The striking knob 26 is at one end of the hammer 23 while at the opposite extremity is placed an inclined offset 27.

The gong is preferably a coiled spring 28, placed as shown on Figs. 1, 2 and 3. Other forms of gongs and bells might be employed of course.

Behind the back of the clock frame is placed an abutment 29 preferably of bent wire or the like. Its relation to the clock frame and the plane of rotation of the hammer 23 is shown in Figs. 1, 2, 3 and 6.

The inclined offset 27 is so placed as to be brought in contact on its inclined face with the abutment 29 and slide against it, when the hammer 23 revolves and is intended to strike on the gong 28. The result of this impingement is to swing the hammer 23 on the pin 24 against the resistance of the spring 25 at the moment that 27 and 29 come together. As seen from inspection of Fig. 1, such a position brings the knob 26 near the gong 28, and as the hammer 23 is thus tilted the knob is made to strike the gong once. Then the spring 25 at once restores the middle position of the hammer 23 and the knob 26 no longer touches the gong. Thus for each revolution of the shaft 21 and attached hammer 23, the abutment 29 and offset 27 will cause the hammer to strike the gong once.

The working of the striking apparatus is as follows: In the clocks, for instance, the striking of the hours and half hours is controlled by two cams 4 and 6. As the pin 12 sliding on the cam 6 is passing over the smallest tooth thereof, the lever 14 rises the rack 15, goes up one tooth and correspondingly moves the pinion 17. The pin 20 being in engagement with the pinion 17, the wheel 18 rotates and causes the axle 21 bearing the hammer to make one revolution. This hammer 23 likewise makes one revolution but while rotating it is turned out of the position perpendicular to its axis 21 and its knob 26

strikes against the gong 28 and thus indicates with one stroke a half-hour. Immediately after the stroke the spring 25 brings back the hammer to its normal position. As the pin 12 is passing over the largest tooth of the cam 6, the lever 14 rises, the rack 15 goes up as many teeth as the movement of the other pin 10 allows it by coming in contact with the other cam 4. Each tooth of the rack 15 corresponds to one revolution and consequently to one stroke of the hammer.

When it is desired to turn the hands backwards to set the clock, the bevels upon the advancing faces of shoulders 7 of the cam 6 act so as to push the pin 12 forward, and with it the shaft 8 and the whole mechanical system attached to said shaft, *i. e.*, arms 9, 11 and 14. I have termed this part of mechanism: the longitudinally moving shaft or the reversible striking train.

Many modifications of various parts of my device are possible without departing from the spirit of my invention, and I am not to be understood as limiting myself to the precise details herein shown and described.

My striking mechanism for instance, either alone or in combination with any other device already known may be applied to all kinds of apparatus, such as signals, telegraphs and to the other sounding and striking apparatus.

What I claim is:—

1. A striking mechanism comprising a revolving and deviating hammer, and mechanisms for operating the same, a main shaft, a snail on said shaft, a second shaft and let off cam thereon, and connections between the hammer operating mechanism, the snail and the let off cam for the purpose specified.

2. A striking train including an oscillating and endwise movable spindle having a lifting arm, a limiting arm and a gear rack thereto, means for impelling said train and a revolving and deviating hammer operated by said train, substantially as shown and described.

3. In a striking mechanism a reciprocating gear rack and a revolving hammer in combination with a clutching and transmitting device comprising: a separate shaft, a gear wheel loosely mounted on the said shaft, a driving pinion fixed on the shaft, a spring and a clutch on the said wheel adapted to engage with the said pinion as it is turning in one direction and to escape it as it is turning in the opposite direction.

4. A striking mechanism including a shaft, a balanced rigid hammer mounted on said shaft and rotating with it, and a cam for causing said hammer to deviate from its normal plane for striking on the gong when the hammer is operated.

5. In a striking mechanism a balanced hammer, means for revolving it and means for deviating the same and comprising: a

spring on the hammer tending to preserve
its median position, an inclined offset on the
hammer for causing and regulating its devi-
ation in combination with a stationary abut-
5 ment adapted to be brought in contact with
said offset when the hammer revolves.

In witness whereof, I have hereunto signed

my name this 11th day of September 1900,
in the presence of two subscribing witnesses.

JÖNS PETER LARSSON LINDSTRÖM.

Witnesses:

AUGUSTE FOURNOL,

VICTOR DE MARENDOWSKI.