

No. 748,108.

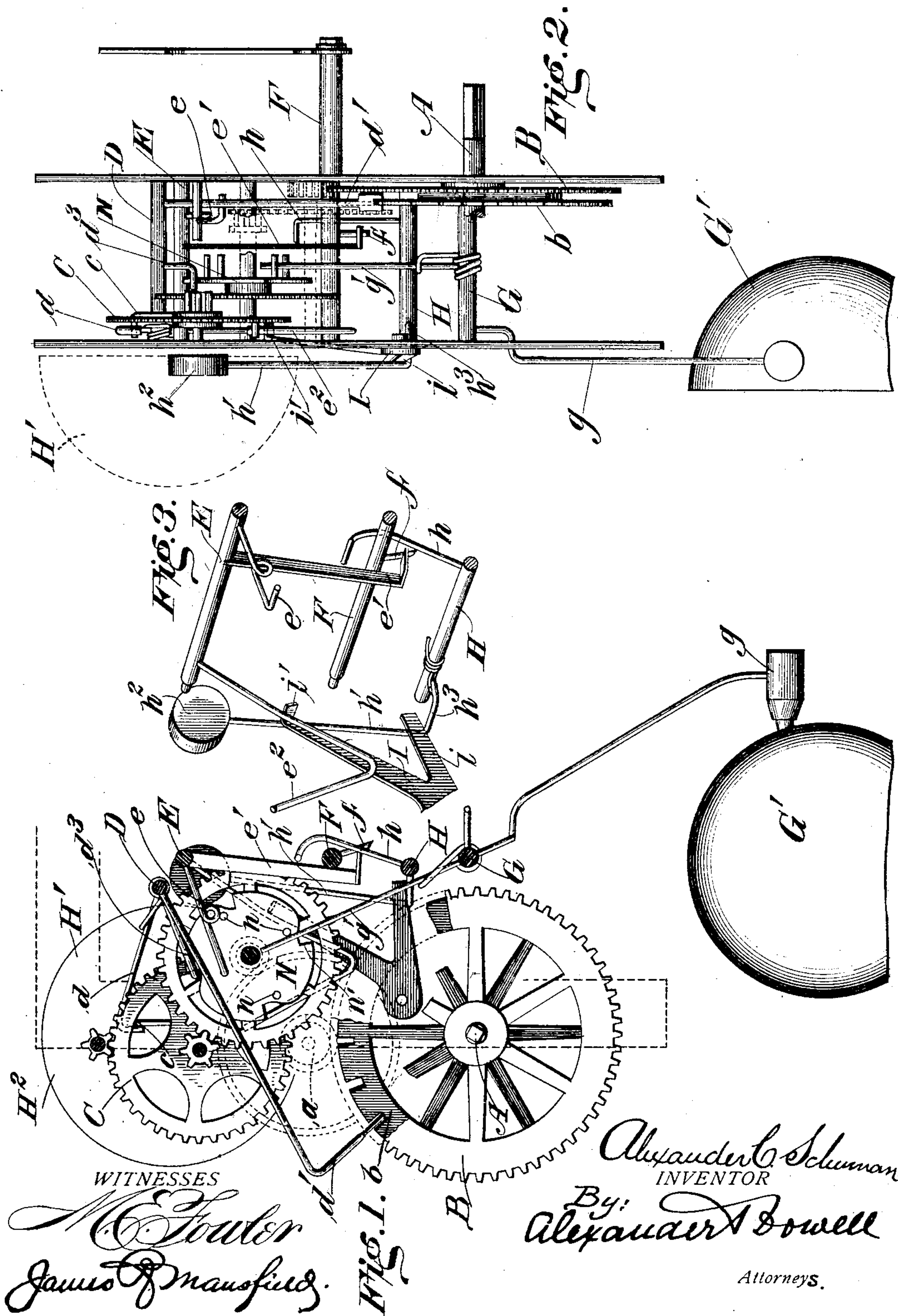
PATENTED DEC. 29, 1903.

A. C. SCHUMAN.
CLOCK STRIKING MECHANISM.

APPLICATION FILED SEPT. 2, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 4.

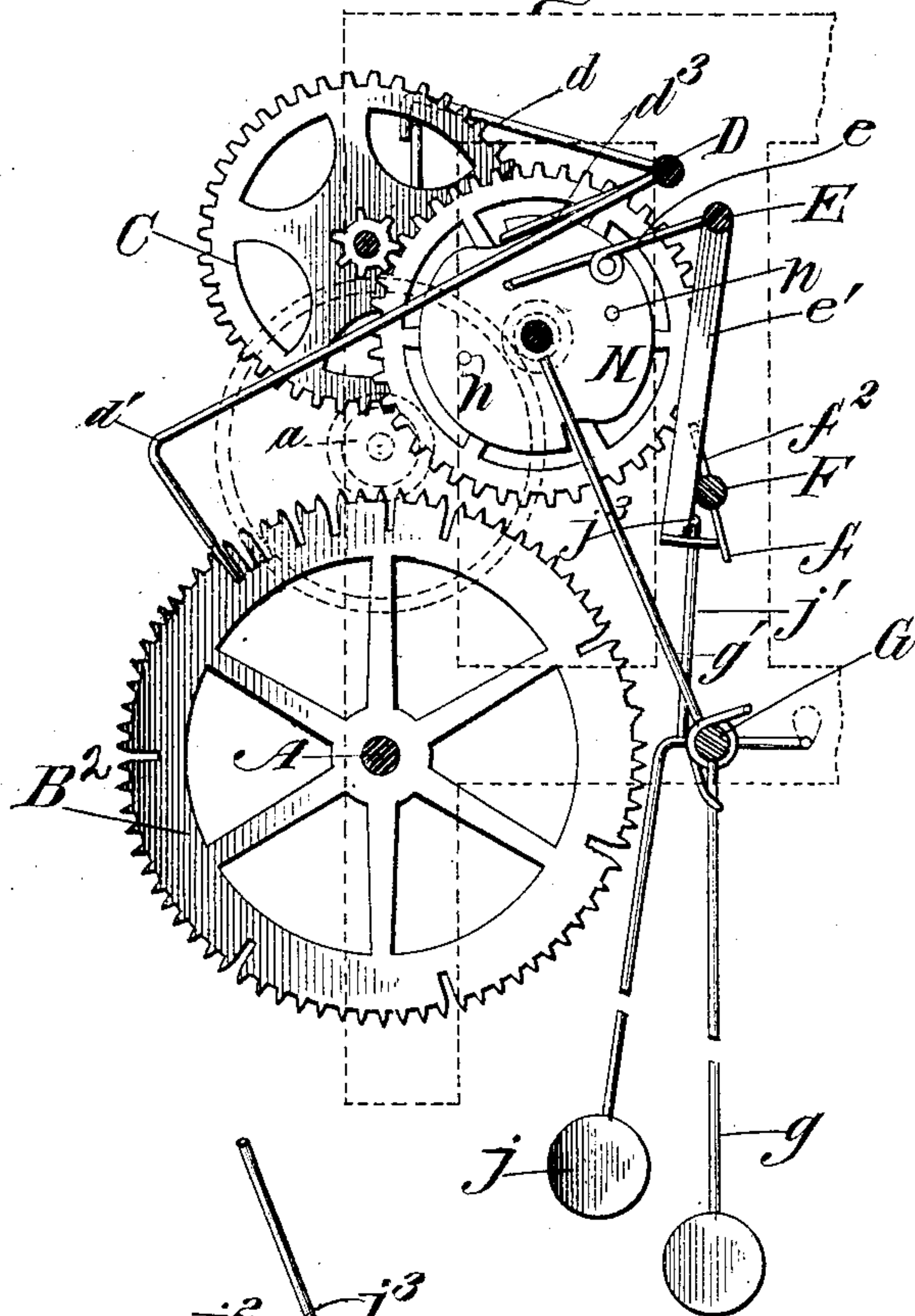


Fig. 5.

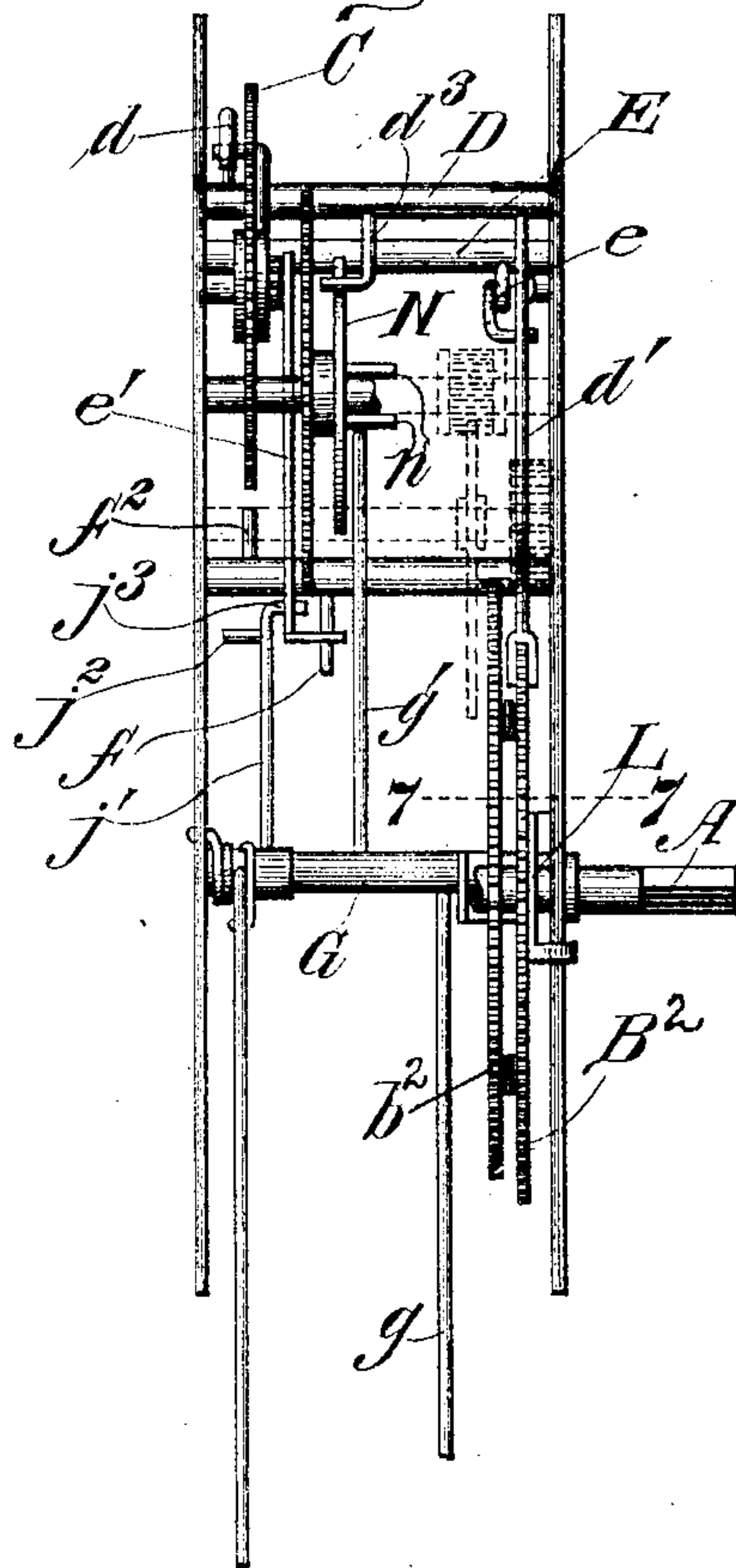


Fig. 6.

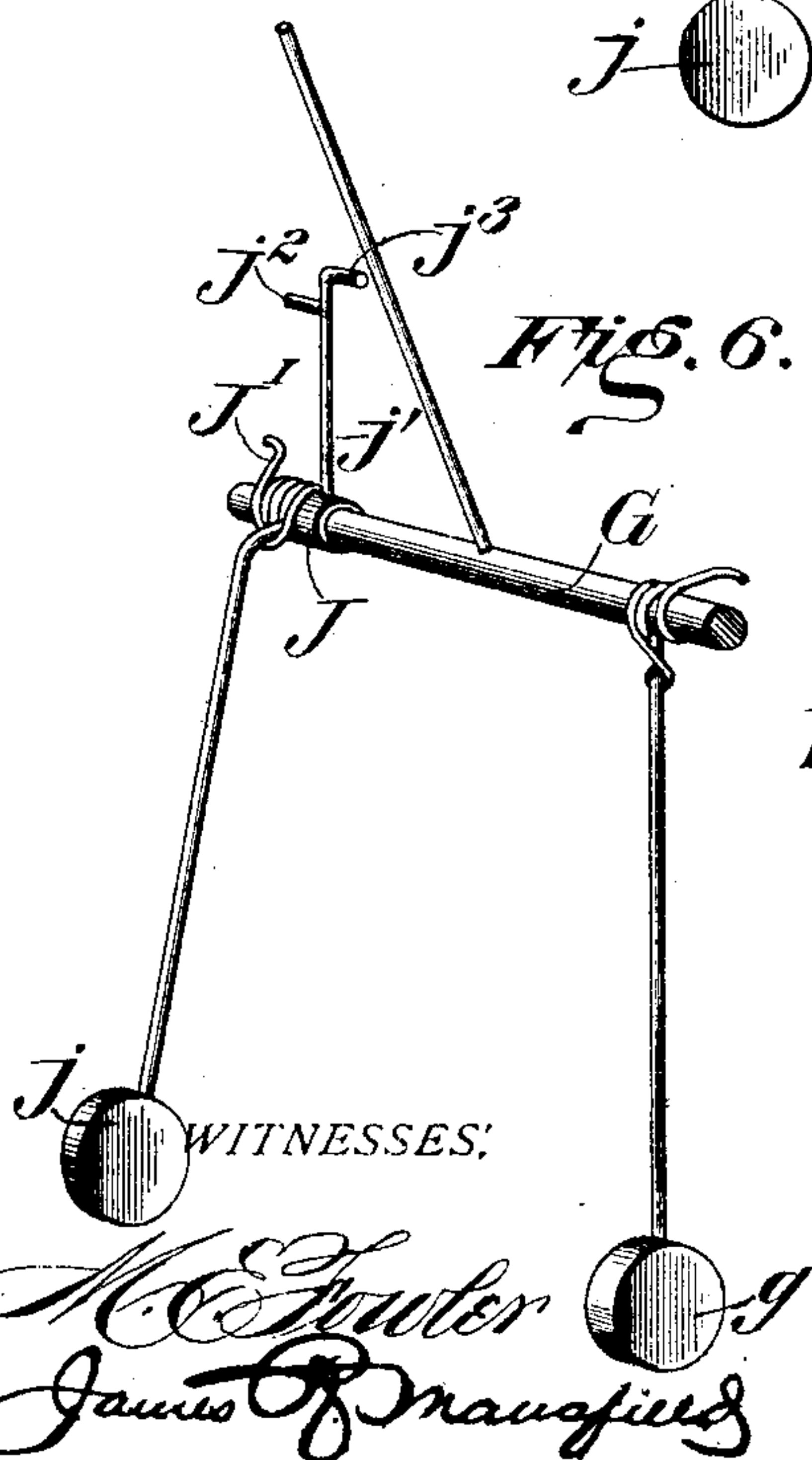
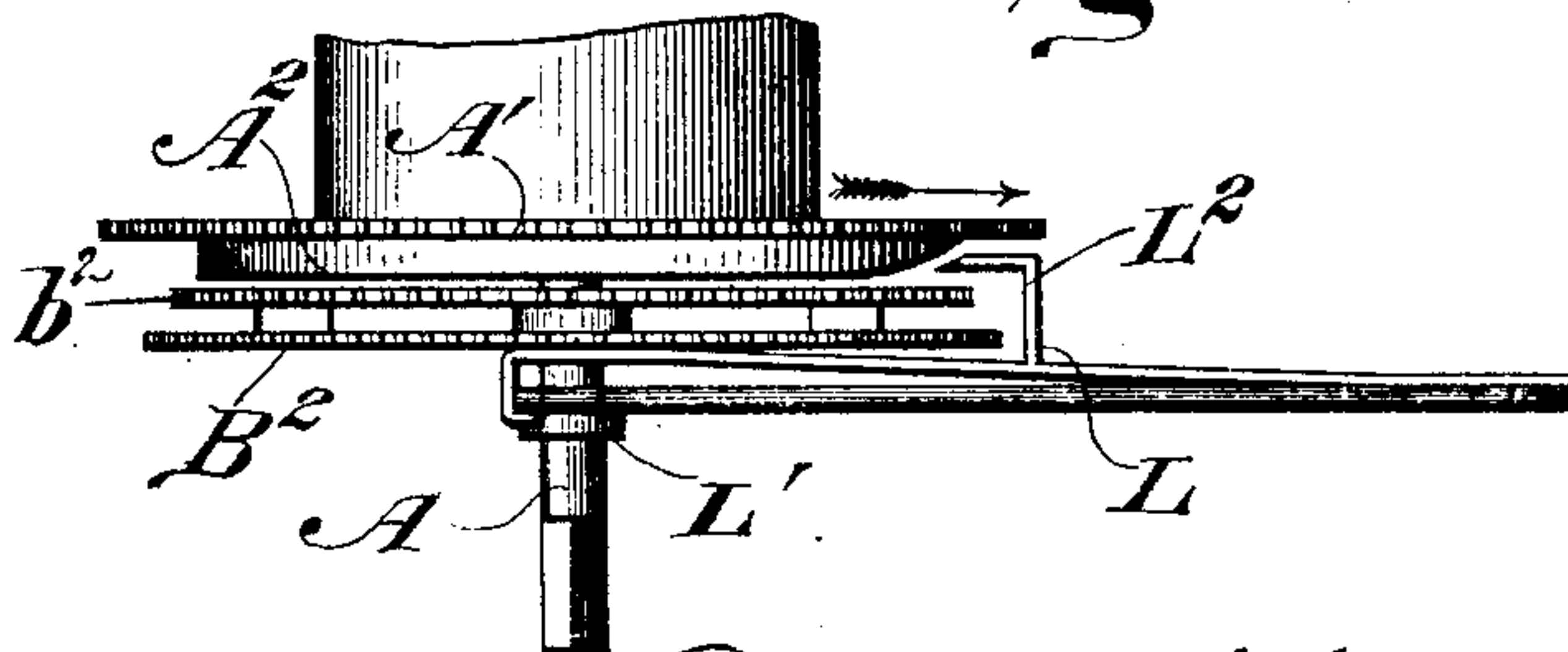


Fig. 7.



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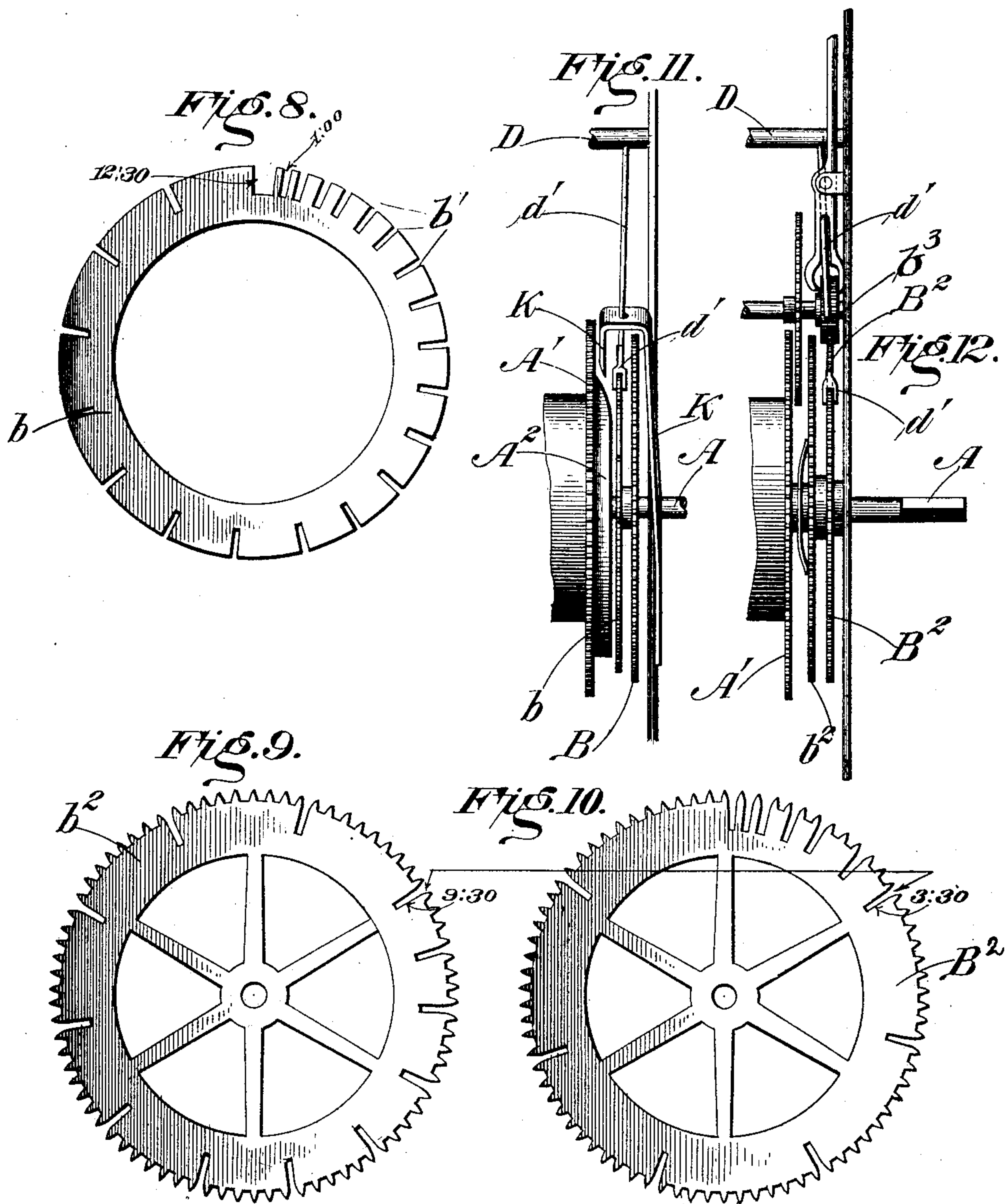
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NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

ALEXANDER CHARLES SCHUMAN, OF LOUISVILLE, KENTUCKY, ASSIGNOR
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CLOCK STRIKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 748,103, dated December 29, 1903.

Application filed September 2, 1903. Serial No. 171,662. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER CHARLES SCHUMAN, of Louisville, in the county of Jefferson and State of Kentucky, have invented
5 certain new and useful Improvements in Clocks; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this
10 specification.

This invention is an improvement in clocks, and has particular reference to the striking mechanism thereof, its object being to provide improved mechanism of very simple construction whereby the hour-strokes are repeated at the half-hours and preferably the half-hour indicated by a stroke on a distinctive-toned bell or gong. It is also preferable
15 to have the half-hour struck before the repetition of the hour. By these means the time can be determined by the strokes without the necessity of seeing the clock, rendering it particularly usefull at night.

In the present invention the minute-hand
25 shaft is utilized to trip the half-hour strike mechanism as well as the hour and hour-repeating strike mechanisms, and the construction is such that it can be readily applied to ordinary timepieces with little expense and
30 without complicating or disarranging the usual trains of strike and time mechanism.

The invention will be clearly understood from the following description in connection with the accompanying drawings, in which—

35 Figure 1 is a front view of the striking-train of an ordinary clock provided with my improved half-hour strike and hour-repeating mechanism and showing so much of the ordinary time mechanism as is needful to impart a clear understanding thereof. Fig. 2 is
40 a side view of Fig. 1. Fig. 3 is a detail perspective view of the half-hour strike and hour-strike tripping devices. Fig. 4 is a detail view showing a modification of the striking mechanism. Fig. 5 is a side view of Fig. 4. Fig.
45 6 is a detail perspective of the hammer-supporting shafts of Figs. 4 and 5. Fig. 7 is a detail view illustrating devices for shifting the strike-wheel and rim instead of the locking-finger. Fig. 8 is a detail view of the rim
50

shown in Fig. 1. Figs. 9 and 10 are views of the locking-wheel and rim or companion wheel, showing the arrangement of notches thereon in the clocks shown in Figs. 4, 5, and 7. Fig. 11 is a detail view of the mechanism
55 for shifting the locking-finger. Fig. 12 is a detail view of a modification wherein the notched wheels are independently driven by a shiftable pinion.

In the drawings, A designates the winding-
60 shaft on which the strike-wheel B is mounted in usual manner, shaft A being rotated by a spring (not shown) and transmitting motion through a train of gears, as usual, to the controlling-wheel C, which is normally arrested
65 by the stop-rod *d*, fastened to a rock-shaft D, to which shaft the locking-finger *d'* is attached, said finger extending to the strike-wheel B and having its end bent down to engage the teeth or notches of said wheel, as
70 usual. In the construction shown in Figs. 1 to 3 the wheel B has no deep locking-notches in it, but is simply uniformly toothed, so that it can be rotated by the small pinion
75 *a* on the shaft of one of the intermediate gears of the train driving the locking-wheel from shaft A, this arrangement of gearing being common. To the side of wheel B, however, is attached a notched rim *b*, having a
80 double series of hour-locking notches *b'*, with which the locking-finger *d'* successively engages to stop the action of the striking mechanism after each series of hour-strokes or repetition of such strokes. This rim *b*
85 contains twice as many locking-notches as the ordinary strike-wheel would have. Consequently in one revolution of wheel B there are strike-sections for all the hours on the hour and for repetitions of all the hours on the half-
90 hours. Thus there are two consecutive "six-o'clock" sections, two consecutive "seven-o'clock" sections, &c. This rim *b* is permanently connected to wheel B and forms virtually part thereof, as shown.

The shaft D is rocked on the hours, so as
95 to disengage the locking-finger from a notch in rim *b* and stop-rod *d* from the stop-pin *c* on wheel C by means of the usual devices, comprising a lift-rod *e* on a rock-shaft E, adjacent to but below shaft D, said trip-rod
100

underlying the locking-finger d' and adapted to lift it when shaft E is properly rocked. Shaft E has a depending arm e' which depends beside the minute-hand shaft F and is engaged every hour by a pin f on said shaft, which at the proper time causes arm e' to rock shaft E and disengage the locking-finger from a locking-notch, as usual. Shaft E also carries the controller-rod e^2 , which prevents wheel C rotating during the uplifting of the locking-finger and until pin f has actuated and released arm e' , whereupon the strike-wheel begins to revolve and continues to revolve until the locking-finger drops into one of the locking-notches b' in rim b , which brings stop-rod d into the path of pin c and stops wheel C until the locking-finger is again raised. The hour hammer g is carried on a rock-shaft G, which has an arm or rod g' , that projects upwardly beside the controller-disk N, which is mounted on the shaft of one of the intermediate train of gears between shaft A and wheel C, said disk having laterally-projecting pins h , which successively engage rod g' and cause it to rock shaft G, and the hour-gong G' is sounded each time the rod g' is released by a pin h . The shaft D has a finger d^3 , which overlies the disk N and is adapted to enter notches n' in the periphery of said disk, as usual, the parts of the mechanism thus far described, excepting the peculiar construction of wheel B and rim b , being similar to those ordinarily employed in striking-clocks.

The mechanism for striking the half-hour gong and for tripping the hour-strike mechanism at the half-hours is as follows: Below the minute-hand shaft F is a rock-shaft H, to which is attached an arm h , which projects up beside shaft F, and its upper end is bent into position to be struck by pin f on shaft F and rocked thereby when the shaft F has been turned around to "half-past" position. To the other end of the shaft is attached a rod h' , which carries a hammer h^2 and is adapted to strike a gong H' when the shaft H is rocked and released by pin f disengaging arm h' , thus sounding one stroke on a distinctive sounding-gong at the half-hour. It will be observed by reference to Fig. 3 that rod h' is bent, as at h^3 , so as to underlie the lower arm i of a bell-crank lever I, which is pivoted at its bend, and its upper end i' underlies the rod e^2 , and consequently when shaft H is rocked, as described, to cause the half-hour strike, lever I will through e^2 rock shaft E, disengaging the locking-finger d' from rim b and stop-rod d from pin c . Consequently the preceding hour-strokes will be repeated until the locking-finger drops into the next notch of the locking-wheel rim b . Thus at every hour the proper strokes will be sounded by hammer g on gong G' and at every half-hour a half-hour stroke will be sounded by hammer h^2 on gong H', and then the preceding hour-strokes will be repeated by hammer g on gong G'.

In the modification shown in Figs. 4, 5, and 6 the arrangement of the hour-striking mechanism is the same as that already described, corresponding parts being similarly lettered. In this latter construction, however, instead of using a single rim b , containing a double set of hour-strikes, I employ a wheel B² and attached rim b^2 , each containing a certain proportion of the hour-strikes. Consequently both the wheel B² and rim b^2 are provided with locking-notches. In this modification instead of using a separate rock-shaft H the half-hour hammer j is hung on a short sleeve J, which is journaled on one end of shaft G and is controlled by a spring J'. To this sleeve is attached an arm j' , which projects toward shaft F and has a pin j^2 on its side adapted to be struck every half-hour by a pin f^2 on shaft F, and thereby caused to rock sleeve J' against the tension of the spring J², which causes the hammer to sound a suitably-located gong when pin f^2 disengages pin j^2 . Arm j' , moreover, has its upper end j^3 bent so as to engage the lower end of arm e' when the rod j' is rocked by pin f^2 , and thus the rocking of sleeve J to sound the half-hour causes the rocking of shaft E, so that arm e lifts locking-finger d' and the hour-strikes are repeated immediately after the half-hour strike by the hammer g . The strike-sections and lock-notches in the wheels B² and rim b^2 are equally divided, half of them being in the strike-wheel B² and the other half in the periphery of the rim b^2 , attached to said wheel. The sections from four o'clock to half-past nine, inclusive, are contained in the wheel B², the sections from ten o'clock to half-past three, inclusive, in the rim b^2 . The locking-finger d' engages alternately with the strike-wheel B² and with the attached rim b^2 , the change from one to the other occurring once for each complete revolution of said wheel B². The arrangement of strike-sections is such that after repeating the hour-strike at half-past nine on the wheel B² the finger d' changes to the rim b^2 , then during the next revolution of the wheel B² the hours from ten o'clock to and including half-past three are struck on rim b^2 , and the finger d' then changes back to the wheel B², and during the next revolution of said wheel four o'clock and the intervening hours and half-hours up to and including half-past nine are sounded on the wheel, then another revolution of the strike-wheel being completed the change back to the rim occurs.

The locking-finger d' in the construction shown in Fig. 11 is guided in a spring-arm K, which normally holds the finger d' in position to engage the notches in rim b ; but at the proper time a cam A² on the side of gear-wheel A', which transmits motion from shaft A to the striking-train, engages the end of arm K and forces the latter outward, so that finger d' is shifted from the rim b to the wheel B² and is kept in this position until the wheel makes a revolution. In the construction

shown in these figures wheel B^2 and rim b make two revolutions to each revolution of gear A' .

Instead of shifting the locking-finger d' from the rim to wheel, as described, the wheel and rim may be shifted together on shaft A , so as to alternately engage the locking-finger, such constructions indicated in Figs. 4, 5, and 7, wherein the said wheel and rim are supported on a collared sleeve L , surrounding shaft A , said collar being engaged by a spring-arm L' , which normally keeps the wheels B^2 in position for engagement with the locking-finger; but at the proper time the cam A^2 on gear A' engages a finger L^2 on the spring-arm and forces the latter outward, causing it to shift wheel B^2 and the rim b and keep the latter in position to engage the finger d' during the next revolution of wheel B^2 .

In the modification indicated in Fig. 12 two strike-wheels B^2 and b^2 are used side by side, the latter having the same relation to wheel B^2 as the rim b in Figs. 4 and 5 and having strike-notches like the rim. Said wheels are rotated alternately by means of the pinion b^3 on the shaft of one of the gears of the striking-train, and suitable mechanism (not shown) may be provided to shift said pinion on its shaft at the proper time, so as to alternately rotate the wheels. The mechanism shown in Fig. 8 may be employed to shift the locking-finger at the proper times to engage the proper wheel B^2 or b^2 .

In the clock shown in Figs. 1 to 4 the strike-sections and the locking-notches are all contained in the rim b , attached to the side of what is normally the strike-wheel of the clock, the locking-finger remaining always over said rim in position to engage with same. By comparing this clock with that shown in Fig. 4 it will be seen that to the disk N , which carries the tappets or pins n , which operate the bell-hammer, I have added two additional tappets and two additional cam-notches. This causes the hammer g to sound the bell twice as often for one revolution of said disk and likewise twice as often during one revolution of strike-wheel, so that I am able to sound all the hours from one o'clock to twelve with repetitions thereof at the half-hours during one revolution of the strike-wheel. Consequently all of the strike-sections, both for the hours and also for the repetition of the previous hour at the half-hours, are contained in the rim b , attached to the side of strike-wheel, and this clock will strike eight days without additional spring. In the modifications shown in Fig. 4 two revolutions of the strike-wheel are required in order to sound the hours from one to twelve with repetitions of the hours at the half-hours. This is due to the fact that the strike-sections are divided between the wheel and the rim and to the fact that the additional tappets cannot be added in either of these forms.

In the form shown in Fig. 12 the secondary strike-wheel b^2 is substituted for and instead of the rim b on strike-wheel in Figs. 4 to 8

and contains the same arrangement of strike-sections as does the said rim in Figs. 4 to 8. The two strike-wheels in this plan are movable independent of each other and are alternately rotated each for a complete revolution by the laterally-sliding pinion, the change from one to the other being timed to occur exactly as explained in the description of the first modification.

In all the modifications, taking twelve as a starting-point, the clock will strike on the wheel in use at that time until 3.30 o'clock. It then shifts to the other wheel and so continues until 9.30 o'clock. It then shifts to first wheel again and continues with that wheel until 3.30. In other words, the shifts from wheel to wheel are only made at 3.30 and 9.30, the reason for this being that each wheel or rim must make seventy-eight strokes on bell.

In the preferred form, (shown in Figs. 1 to 3,) where four tappet-pins n are employed and four notches in the disk, the strike-wheel will permit one hundred and fifty-six strokes on hour-gong for each revolution of said wheel. Figs. 10 and 11 show the two strike-wheels or strike-wheel and rim side by side in positions which they occupy when properly axially aligned, these figures showing the deep notches at 3.30 and 9.30 in the proper relative positions and also the relative arrangement of notches in the wheels or wheel and rim. Of course where the rim is used the teeth (shown on wheel b^2 in Fig. 9) are unnecessary, and therefore are omitted.

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

1. In combination with the hour-striking mechanism of a clock provided with two series of hour-strokes; a half-hour-strike mechanism adapted to sound one stroke, and devices actuated by the half-hour-strike mechanism whereby the hour-striking mechanism is released on the half-hours, the half-hour stroke sounded, and the preceding hour-strokes repeated, substantially as described.

2. In a clock, the combination of an hour-striking mechanism arranged to repeat the hour-strokes on the half-hours; a half-hour-striking mechanism, mechanism actuated by the minute-hand shaft for tripping the hour-striking mechanism on the hours, and the half-hour-striking mechanism on the half-hours, and devices actuated by the half-hour-striking mechanism whereby the hour-striking mechanism is released on the half-hours, substantially as described.

3. In a clock, the combination of striking mechanism adapted to strike the hours on the hour, and repeat them on the half-hour, on one gong, and a half-hour-striking mechanism adapted to strike the half-hours only on a distinctive gong; devices on the minute-hand shaft of the clock adapted to trip the hour-striking mechanism on the hour, and the half-hour-striking mechanism on the half-hours; and devices actuated by the half-

hour-striking mechanism adapted to trip the hour-striking mechanism on the half-hour, substantially as described.

4. In a clock, the combination of a strike-wheel provided with two series of notches for repeating the hours during one revolution of the strike-wheel; an hour-strike mechanism having a controlling-disk provided with four notches and four strike-hammer-actuating pins, means for releasing the locking-finger on the hours, and a half-hour-strike mechanism adapted to release the locking-finger on the half-hours to produce a repetition of the hour-strokes, substantially as described.

5. In a clock, the combination of a strike-wheel provided with two series of notches for repeating the hours during one revolution of the strike-wheel, means for rotating said strike-wheel once during twelve hours; an hour-strike mechanism having a controlling-disk provided with four notches and four strike-hammer-actuating pins, means on the minute-hand shaft for releasing the locking-finger on the hours, and a half-hour-strike mechanism, means for actuating the half-hour-strike mechanism from the minute-shaft on the half-hours, and devices actuated by the half-hour mechanism for releasing the hour-striking mechanism to obtain a repetition of the hour-strokes on the half-hours, substantially as described.

6. In a clock, an hour-striking mechanism having a double strike-wheel, part of the strike-notches being in one wheel, and part in the other, mechanism for causing the locking-finger to act with one wheel during a revolution thereof, and then act with the other.

7. In a clock, an hour-striking mechanism adapted to repeat the hour-strokes on the half-hours, a double strike-wheel, one of said wheels containing strike-notches from 9.30 to

3.30 and the other wheel the strike-notches from 3.30 to 9.30, mechanism for causing the locking-finger to act with one wheel during a revolution thereof, and then act with the other.

8. In a clock, an hour-striking mechanism having a double strike-wheel, part of the strike-notches being in one wheel, and part in the other, mechanism for causing the locking-finger to act with one wheel during a revolution thereof, and then act with the other, with a half-hour-strike mechanism actuated on the half-hours, and devices actuated by the half-hour-strike mechanism whereby the hour-strike mechanism is released on the half-hours and the preceding hour-strokes repeated, substantially as and for the purpose described.

9. In a clock, an hour-striking mechanism adapted to repeat the hour-strokes on the half-hours, a double strike-wheel, one of said wheels containing strike-notches from 9.30 to 3.30, and the other wheel the strike-notches from 3.30 to 9.30, mechanism for causing the locking-finger to act with one wheel during a revolution thereof, and then act with the other; with a half-hour-strike mechanism actuated on the half-hours, and devices actuated by the half-hour-strike mechanism whereby the hour-strike mechanism is released on the half-hours and the preceding hour-strokes repeated after the half-hour stroke, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ALEXANDER CHARLES SCHUMAN.

In presence of—

W. W. DAVIS,
M. F. PRICE.