

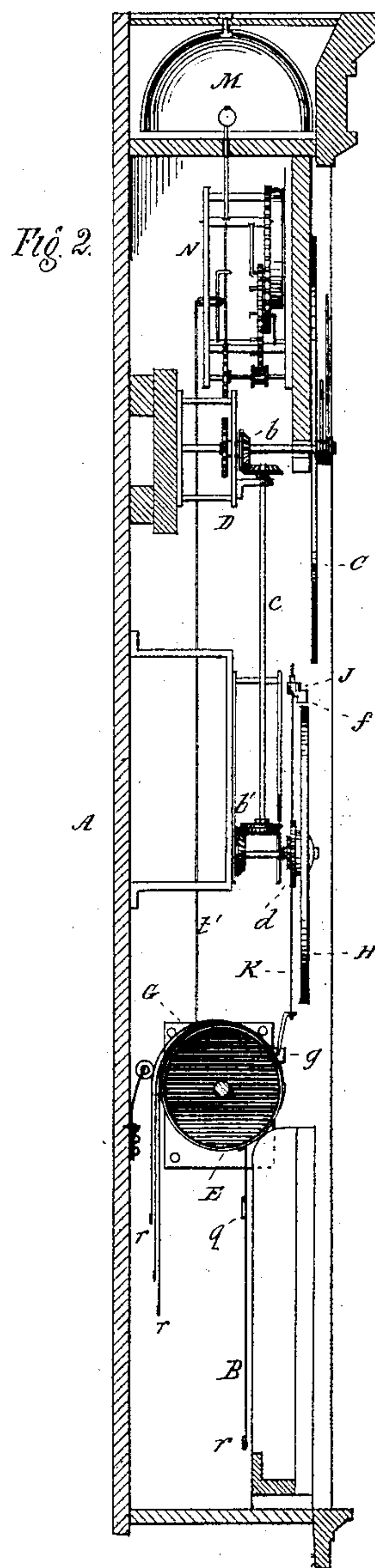
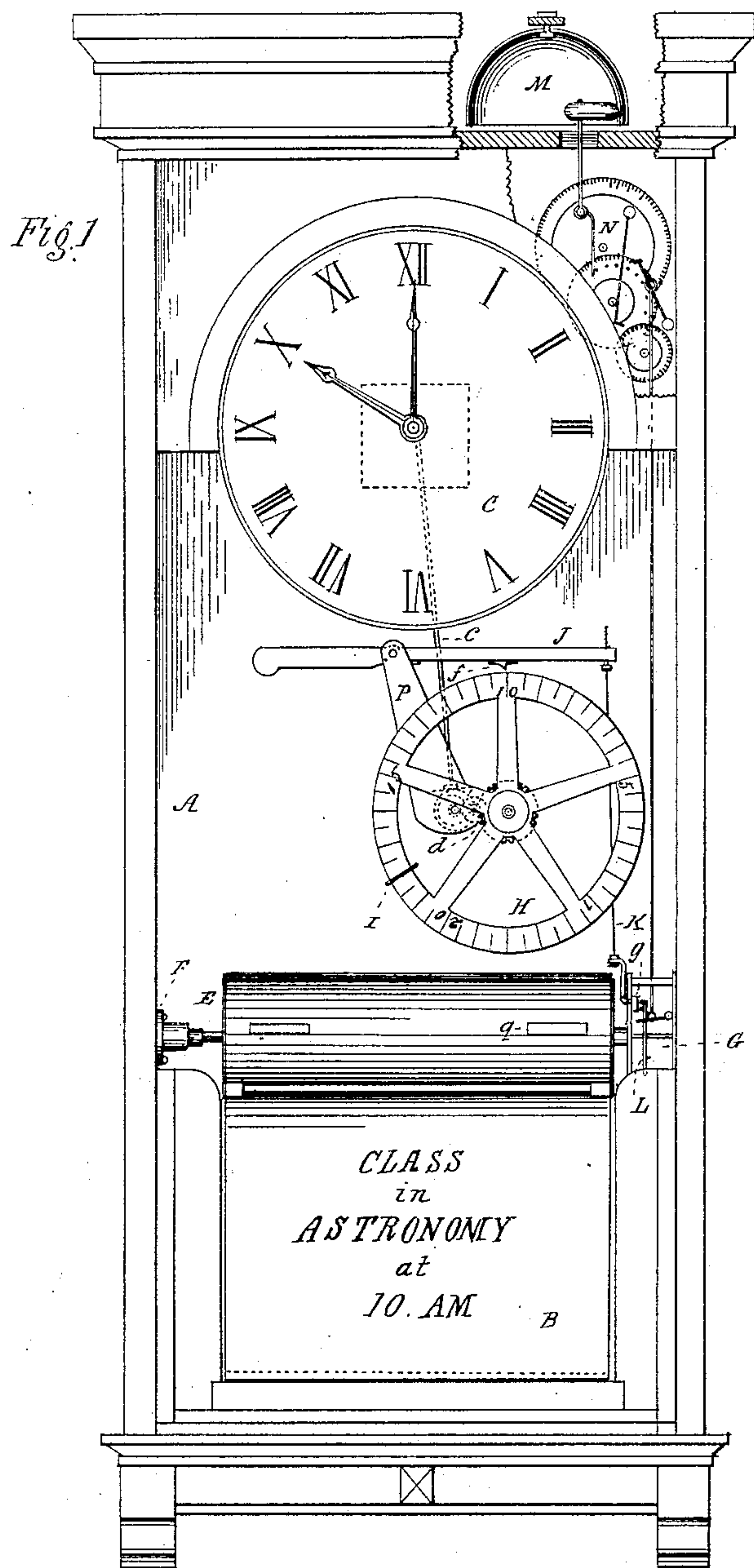
(No Model.)

3 Sheets—Sheet 1.

W. AKIN.  
PROGRAMME CLOCK.

No. 332,694.

Patented Dec. 22, 1885.



Witnesses:  
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Attorney.

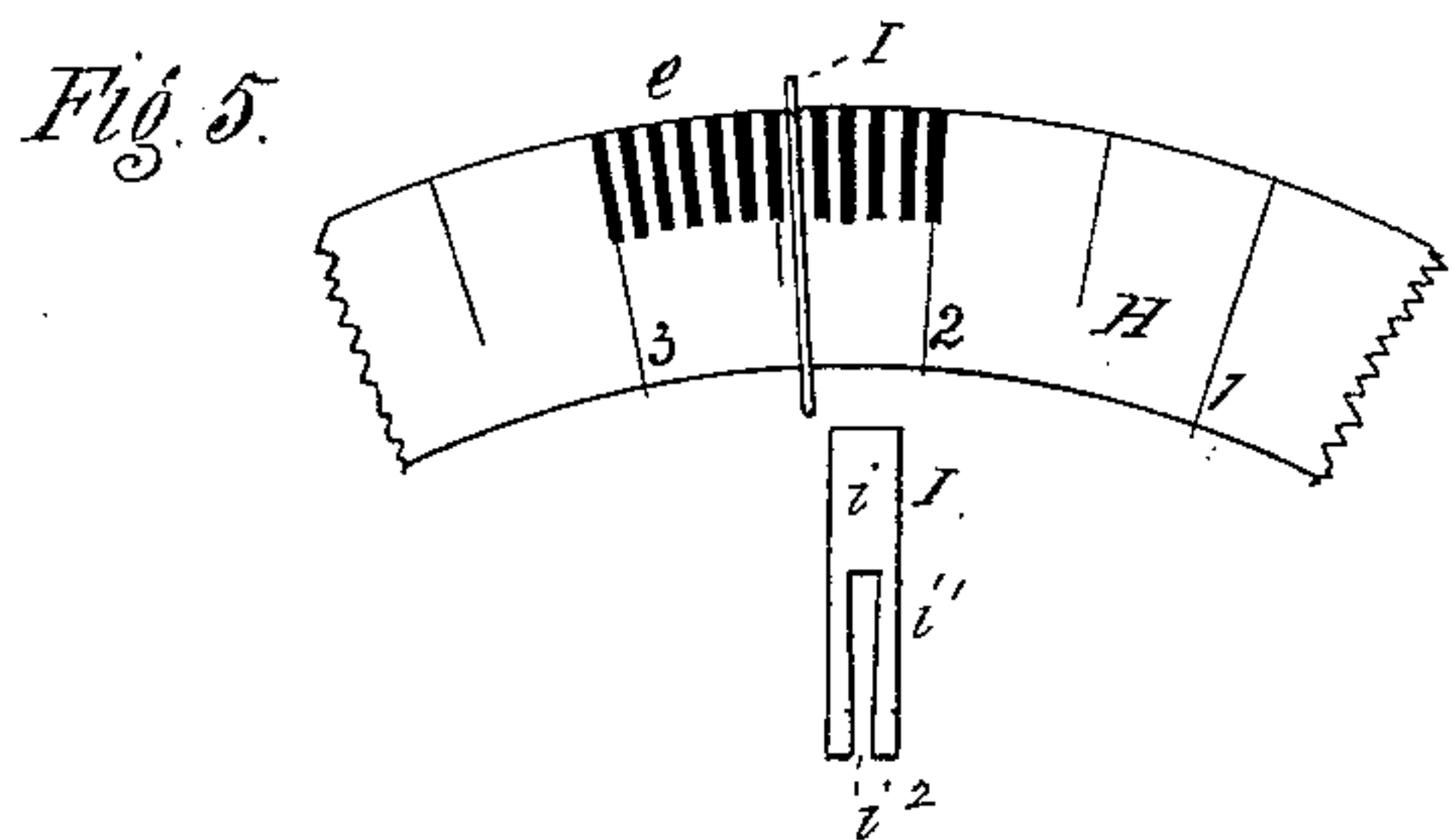
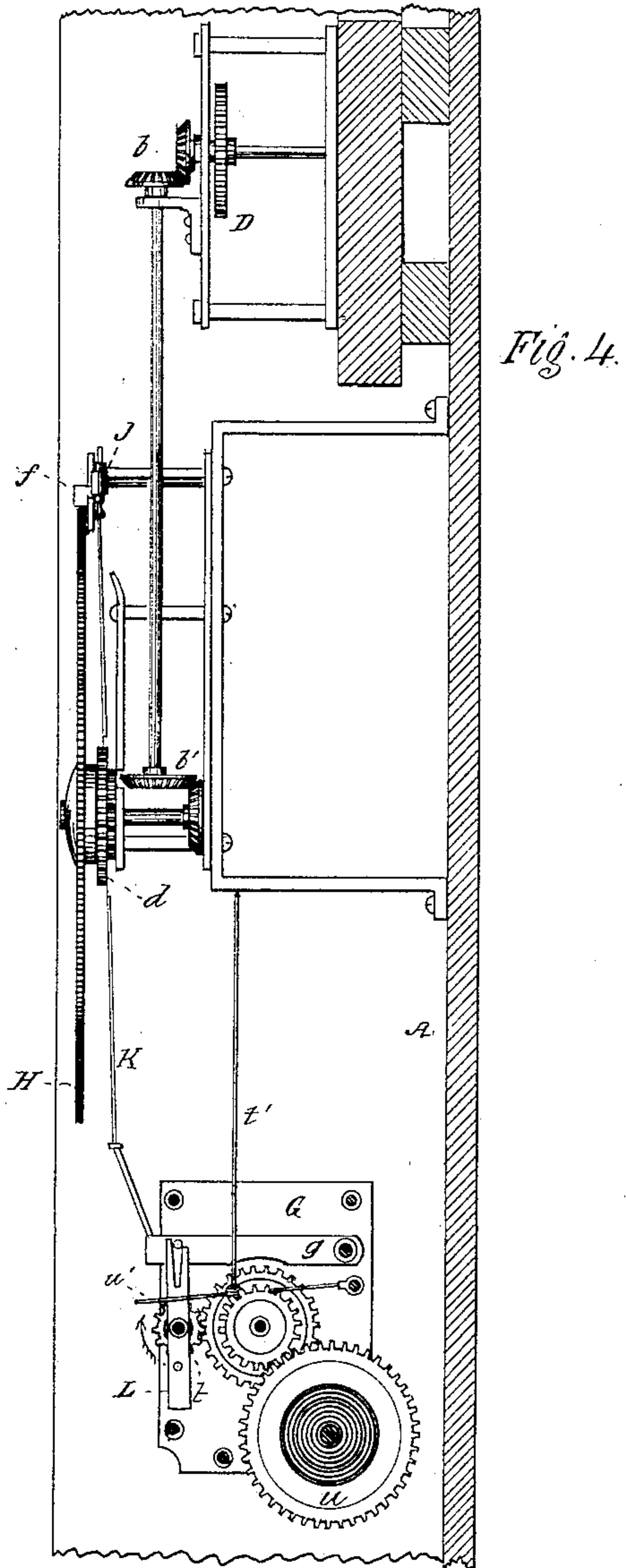
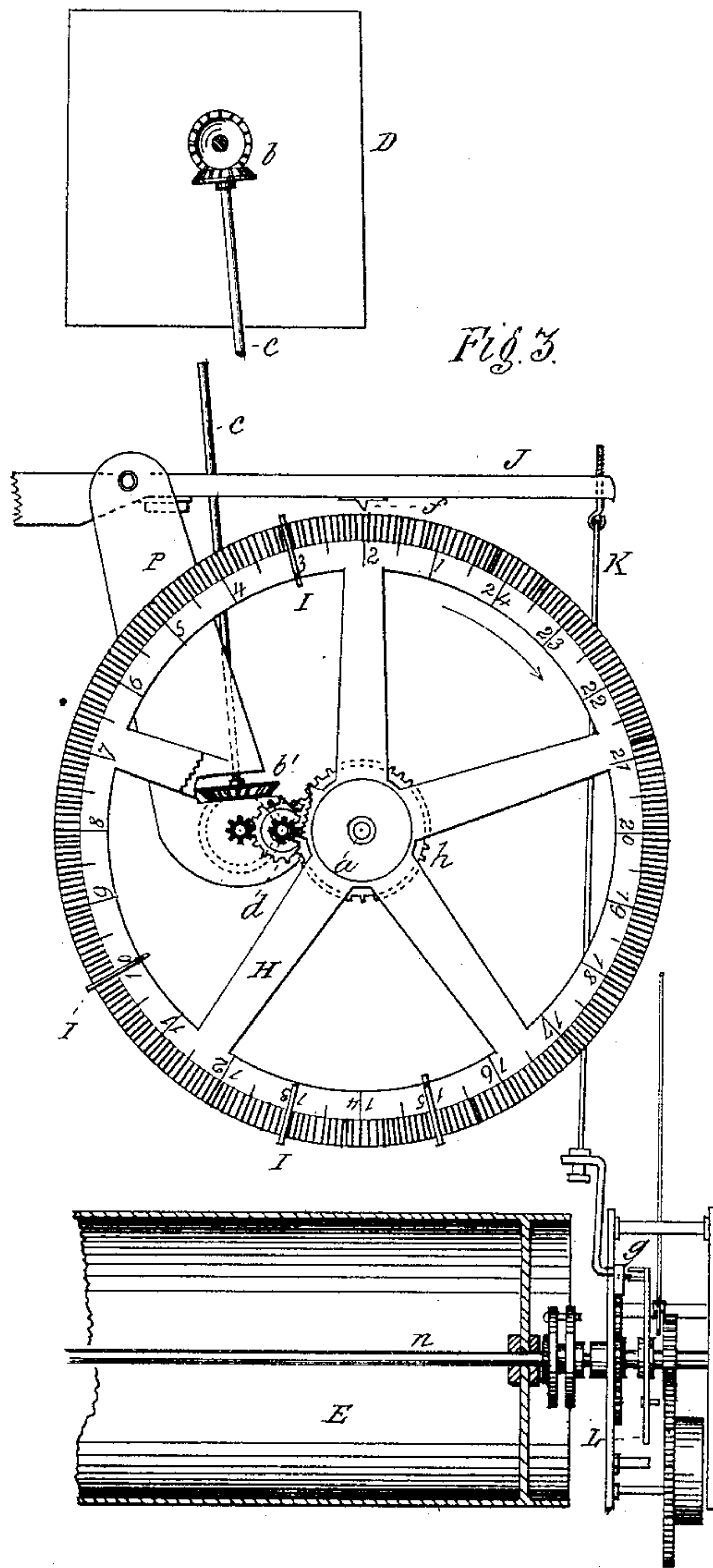
(No Model.)

3 Sheets—Sheet 2.

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Patented Dec. 22, 1885.



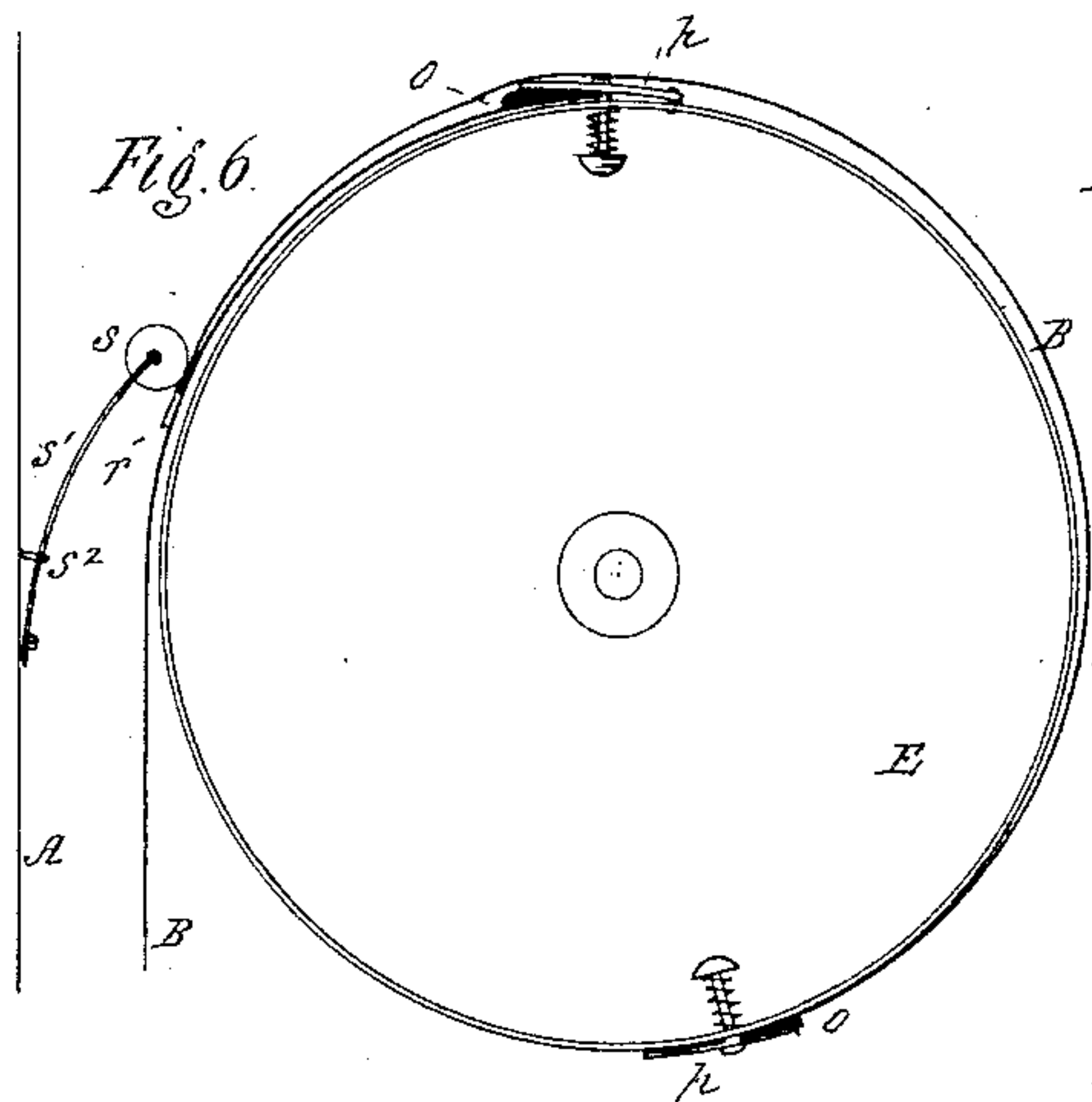
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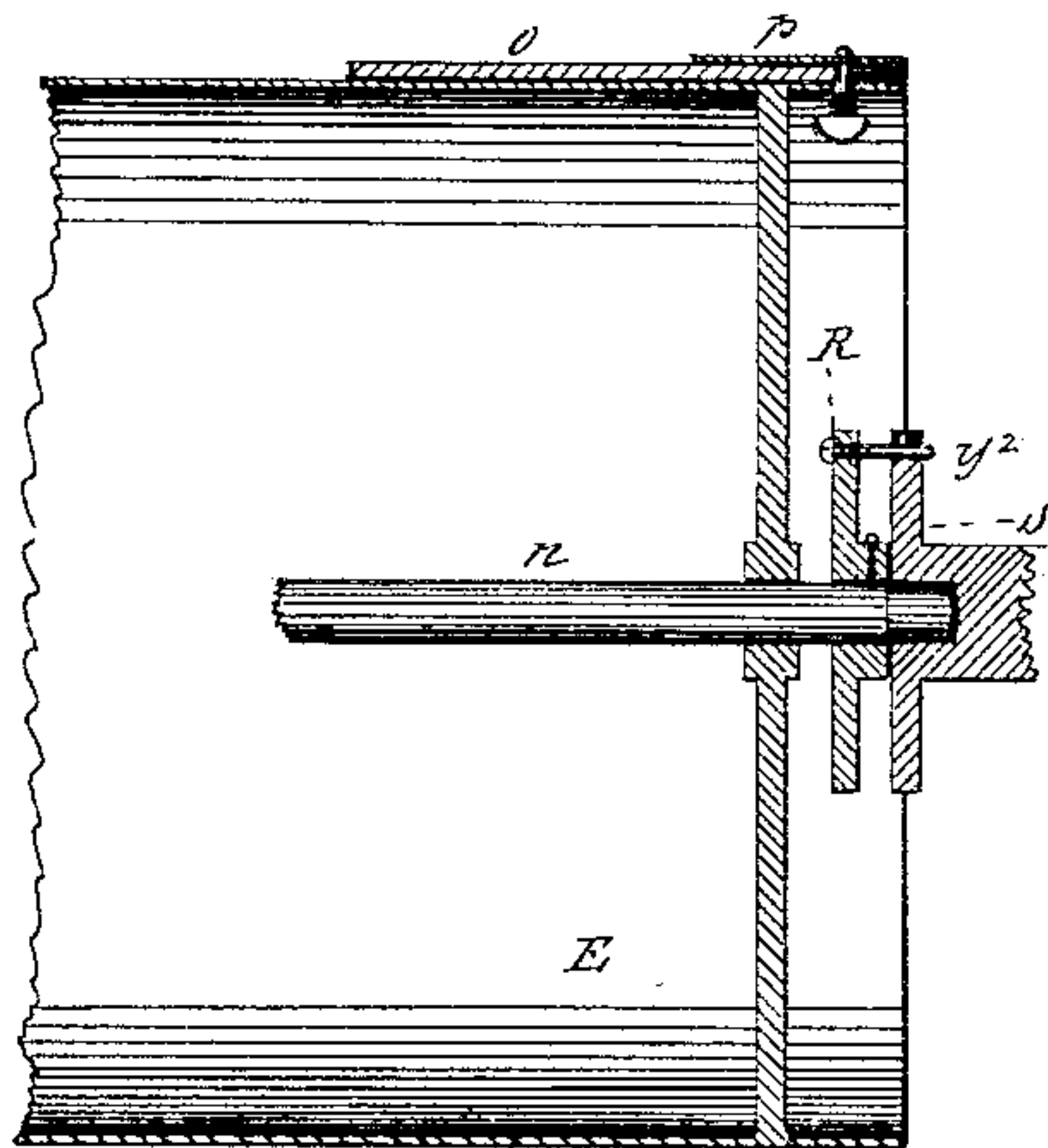
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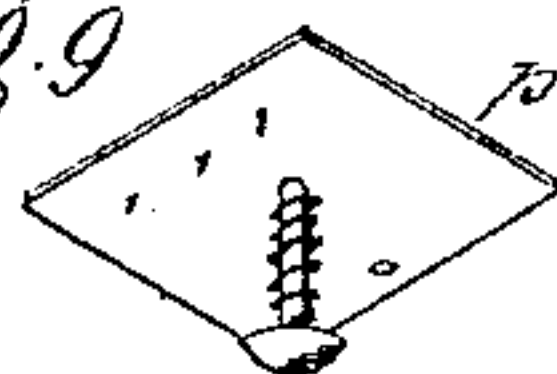
*Fig. 7.*



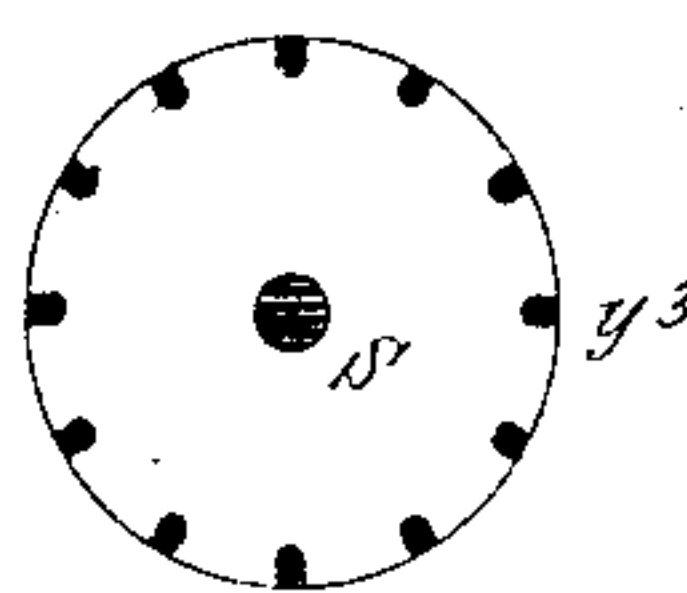
*Fig. 8.*



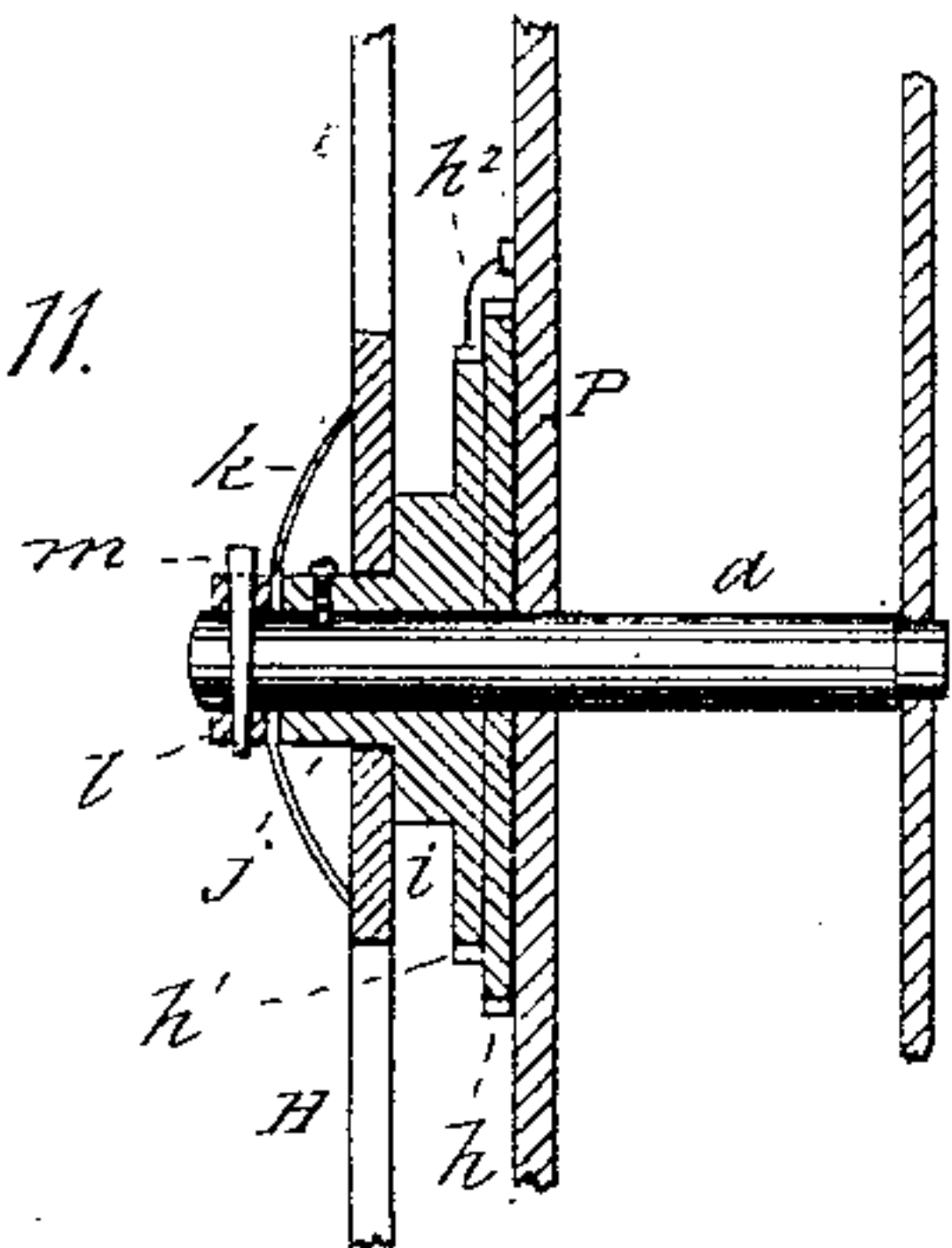
*Fig. 9.*



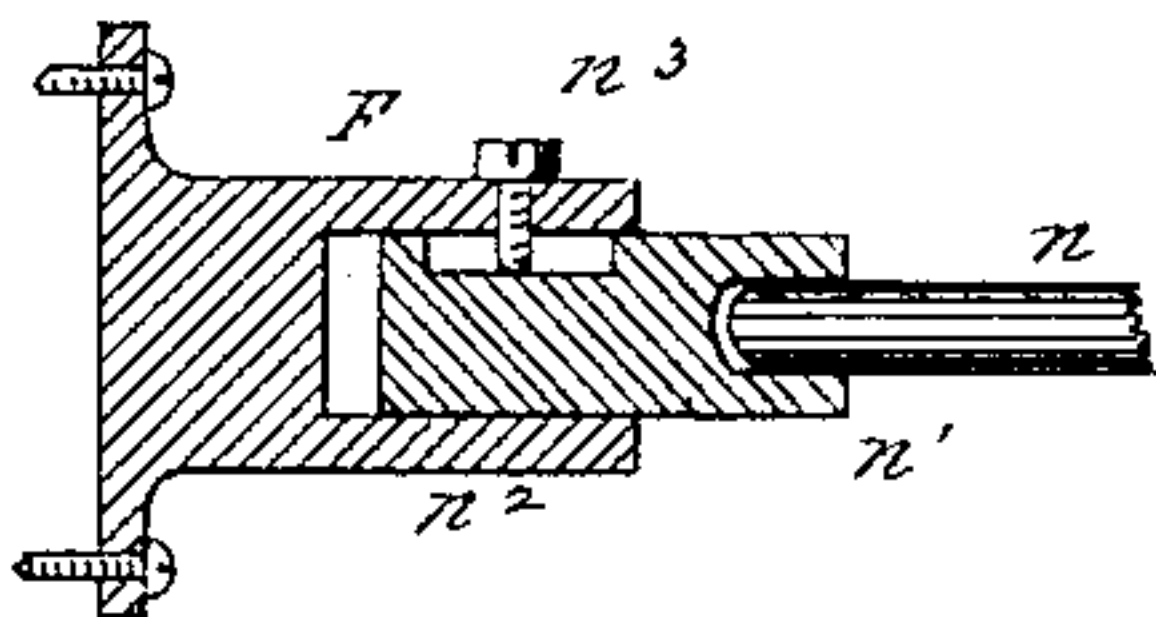
*Fig. 10.*



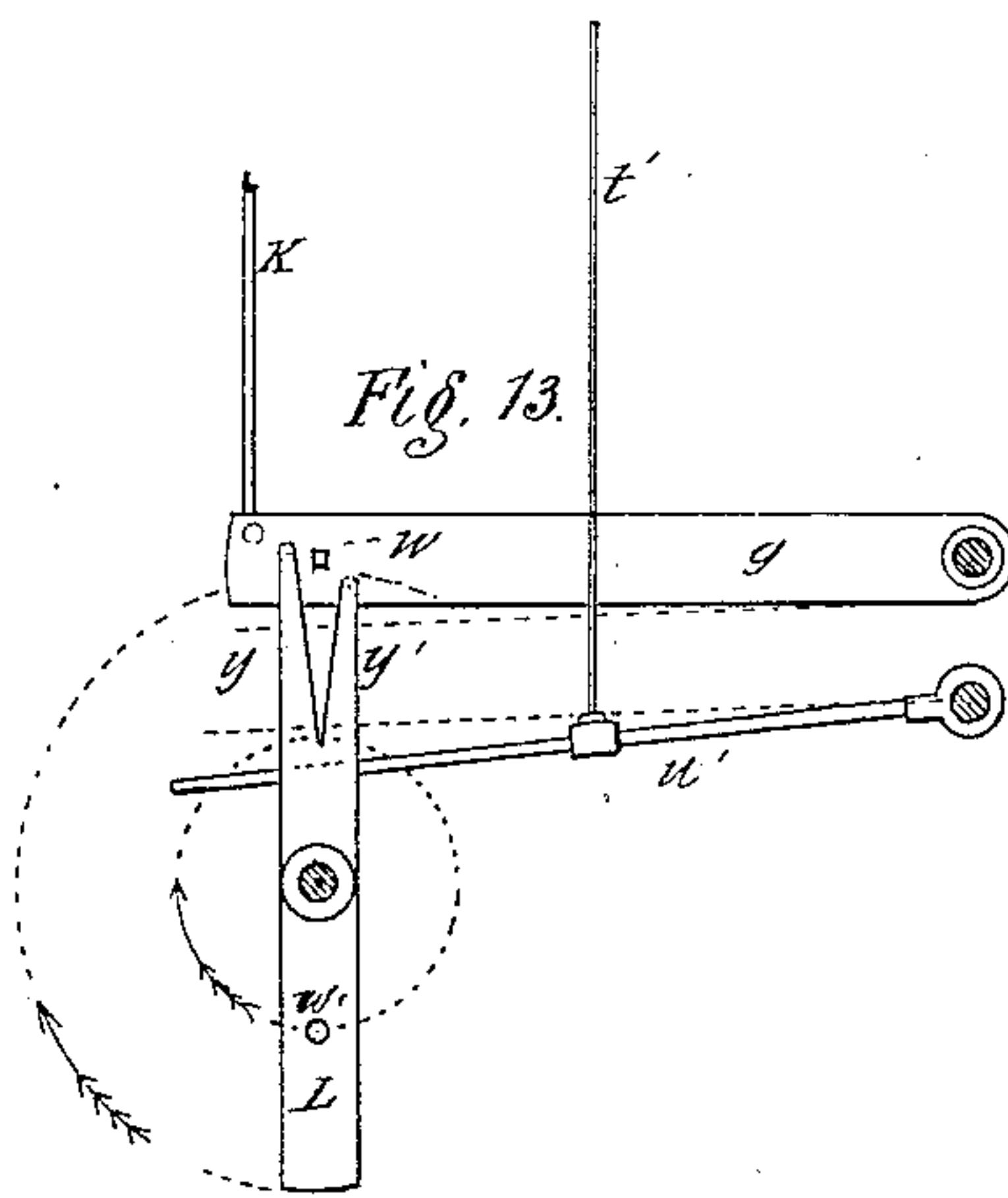
*Fig. 11.*



*Fig. 12.*



*Fig. 13.*



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# UNITED STATES PATENT OFFICE.

WILLIAM AKIN, OF NEW YORK, N. Y.

## PROGRAMME-CLOCK.

SPECIFICATION forming part of Letters Patent No. 332,694, dated December 22, 1885.

Application filed October 23, 1884. Serial No. 146,271. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM AKIN, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Programme-Clocks; and I hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, (on three sheets,) which form a part of this specification.

This invention is chiefly applicable for use in schools for summoning the several classes at the predetermined time set for each, by means of an apparatus which is automatic in its operation, and constructed to bring into view at the proper time a placard containing the title of the class which is called up, and to sound a gong or bell simultaneously therewith to call attention to the same; but it is also equally applicable for other uses, as will be apparent from the following description thereof. The said placards or sheets are wound upon a drum which is rotated to exhibit the same at the proper times by means of an escapement that is released by the motion of the mechanism of the clock with which the apparatus is connected, which said escapement also operates suitable mechanism to sound the bell at the moment the drum is thus rotated; and the construction of the apparatus is such that it can be previously set to automatically announce, by the sounding of the gong and the exhibition of the sheet or placard, when the time has arrived for each class, and also the subject for study or recitation by each class thus called up.

The invention consists in a programme-clock constructed as hereinafter described, and in the novel constructions and combinations of parts as hereinafter particularly set forth.

In the accompanying drawings on Sheet No. 1, Figure 1 represents a front view of a programme-clock constructed according to my invention, the front cover or door being removed, and Fig. 2 is a sectional side view of the same. On Sheet No. 2, Fig. 3 is a front view, and Fig. 4 a side view, of the mechanism for operating the drum. Fig. 5, on the same sheet, is a detail hereinafter explained. On Sheet No. 3, Figs. 6 to 13, inclusive, are detail views, hereinafter referred to and explained. Figs. 3 and 4 are on a scale about twice the

size of Figs. 1 and 2, and the rest of the figures are on a scale about four times the size to which Figs. 1 and 2 are drawn.

Similar letters of reference indicate the same parts in all the several figures.

A represents a case of suitable construction for holding the working parts and exhibiting the sheets or placards B. The front or door (not shown in the drawings) is provided with glass or transparent plates opposite the dial C and sheets B, its intermediate portion being opaque.

D represents the mechanism of a clock or time-piece, and C the dial of the same, both of which may be of ordinary construction.

E is a drum or cylinder, upon which are wound and unwound the sheets or placards B in the order in which they are to be exhibited, and which is journaled at one end to an adjustable bearing, F, and at its other end connected with a shaft on the spring-driven mechanism G, both of which are hereinafter described.

H is a rotating disk fitted upon a shaft, *a*, having suitable bearings within the case A. This disk is divided into twenty-four spaces, representing the twenty-four hours of a day and night, and marked from 1 to 24, inclusive, and is connected with the clock-movement D, from which it derives its motion through the medium of two pairs of bevel-gears, *b b'*, connected by a shaft, *c*, and a train, *d*, of suitable gearing, so that it makes one revolution in each twenty-four hours. The hour-spaces on its outer edge are subdivided, as shown most clearly in Fig. 5, and at each hour-space and subdivision thereof is formed a radial slot, *e*, to receive a removable tooth, I, which latter is inserted into the particular slot *e* answering to the time when some class is to be called. These teeth I slightly project beyond the periphery of the disk H and raise a pivoted lever, J, by coming in contact with a pin or tooth, *f*, with which said lever is provided. To the end of the lever J is secured the upper end of an adjustable rod, K, the lower end of which is connected to the free end of a lever, *g*, in the mechanism G, so that when the lever J is raised by one of the teeth I passing underneath the tooth *f* an escapement, L, (hereinafter described,) is released, thereby allowing the mechanism G to run and to rotate the drum, so as to bring into view the sheet bear-



ing the name or subject of the class appointed for that particular time. The said escapement also operates a striking mechanism, N, simultaneously therewith, and sounds the gong or bell M. It will be observed that by arranging the several sheets B upon the drum in the order in which they are to be exhibited and inserting a tooth, I, into each slot *e* representing the time at which each sheet is to be exhibited, as the clock D moves on in the usual course of time the several sheets are exhibited and the gong simultaneously sounded whenever the time set for each shall have arrived.

I now proceed to describe more particularly the several parts above mentioned. In the drawings the disk H has its hour-spaces subdivided into twelve parts, each indicating five minutes, as the periphery of the disk (making one revolution in twenty-four hours) moves the distance between any two adjoining slots *e* in five minutes; but for some purposes fewer subdivisions may suffice. The disk is fitted loosely on its shaft *a*, so that it can be moved backward, when desired, so as to set it to correspond with the clock D, but is held by a friction device, so as to move synchronously with the clock when left free. In Fig. 11 is shown the mode of its attachment.

P represents a bracket or frame attached to the case A, in which the shaft *a* has bearings. *h* is a gear-wheel forming part of the train *d*. *k* is a spring-disk fitted between said sleeve *j* and a nut, *l*, and resting against the hub of the disk H, and *m* is a pin which passes through corresponding perforations in the nut *l* and shaft *a*, so that when said pin *m* is driven home the spring-disk *k* is pressed against the disk H and produces sufficient friction to cause the latter to move with the shaft *a*, but at the same time admits of the disk H being turned back by hand, when desired. Attached to the gear-wheel *h* is a ratchet-wheel, *h'*, which is provided with a hub, *i*, and sleeve *j*, and is fixed to the shaft *a* and rotates the same. This ratchet *h'* is held by a thin wire pawl, *h<sup>2</sup>*, attached to the bracket P, to prevent backlash in the gearing *d* and disk H. This pawl is made thin, in order to prevent its causing much friction.

The teeth I are formed, as shown in Fig. 5, the solid portion *i* being fitted into any one of the slots *e* so that its outer end projects slightly beyond the periphery of the disk, and its divided lower portion, *i'*, straddles the solid rim of the disk. The sides of the slot *i<sup>2</sup>* are cut slightly tapering, as shown, so as to bear against the sides of the disk and keep the tooth in position.

The lever J is pivoted to the bracket P in such position that its tooth *f* is immediately over the crown of the disk H, and it is counterpoised at its rear end, so as to compensate for the weight of the rod K and lever *g*.

The drum E may be in the form of a hollow cylinder with closed ends, and is fitted rigidly upon a central shaft, *n*. The sheets B are fixed

upon the drum by means of strips *o*, which are laid over the upper edge of each, and are held in position by spring-clips *p*, under which their two ends are inserted at the ends of the drum, as shown in Figs. 6 and 7. The construction of these clips is described and claimed in a prior patent granted to me, as is also the construction of the drum, and I do not claim the same as part of my present invention. Fig. 9 represents a perspective view of one of the clips. The sheets B are provided with flat weights *q* a short distance from their upper edges, to facilitate their being dropped over and in front of the drum at the proper time, and are provided with strips *r* along their lower edges, which are held under a spring-roller, *s*, which is placed in such position as to release said strip *r* as soon as the drum in its rotation reaches the point where it is designed the sheet shall be dropped. The construction of this roller is shown in Figs. 6 and 8, and it consists of a shank, *s'*, of spring-wire, bent at its upper end to form a kind of loop, and a small roller, *s*, pivoted therein, the said shank being secured at its lower end to the back of the case A, and the body thereof embraced by a staple, *s<sup>2</sup>*, driven into the case A, to keep the spring in line. The roller presses upon the back of the sheets and holds them to the drum until the lower strip, *r*, has passed the roller. By this means the sheets are firmly pressed to the surface of the drum without much friction, and the proper action of the sheets is insured. The strips *r* also serve to keep the sheets distended while hanging from the drum.

The escapement above mentioned is constructed as follows: The fly L is pivoted about midway of its length to the frame of the spring mechanism G, and is geared by a pinion, *t*, to the train of gearing driven by the spring-wheel *u*, and its upper end is forked, as shown, one of the forks, *y*, being somewhat longer than the other, *y'*, and each fork provided with a pin projecting at right angles therefrom. These pins successively come in contact with a pin, *w*, fixed in and projecting at right angles from the lever *g*, as the latter rises and falls, and thereby stop the motion of the drum E.

The operation of this escapement will be readily understood by referring to Fig. 13, and is as follows: When one of the teeth I comes against the tooth *f* of the lever J and raises the latter, the lever *g* is simultaneously raised, the two levers being connected by the rod K, and the lever *g* being thus raised the pin *w* is raised above the pin on *y'* and the fly begins to move, but is immediately stopped again by the pin on fork *y* coming in contact with the pin *w*, and remains at rest until the tooth *f* drops over the tooth I, when the lever *g* immediately drops, thus permitting *y* to pass over the pin *w*, and the fly being now released makes one complete revolution, and is then again stopped by *y'* coming in contact with *w*. The drum E, being connected to one of the shafts



of the mechanism G, is thus rotated to bring another sheet into view with each revolution of the fly, and thus into whichever slot  $e$  a tooth, I, is inserted the drum is rotated to change the sheet as soon as the time represented by such slot arrives.

The means for connecting the drum to the mechanism G are shown in Figs. 7 and 10. R is a disk fixed upon the shaft  $n$  of the drum, and provided with a pin,  $y^2$ , fixed at any point near its periphery. S is another disk, of about equal diameter, having a number of equidistant slots,  $y^3$ , adapted to receive the pin  $y^2$ , and connected to a shaft of the mechanism G. The hub of this disk is slotted, as shown, to form a bearing for the end of the shaft  $n$ . The two disks being thus connected, the drum moves simultaneously with the disk S, which is connected with the mechanism G and operated by its escapement.

The gong M is sounded simultaneously with each movement of the drum by means of a pin,  $w'$ , on the fly, which trips a lever,  $u'$ , and thereby lifts a rod,  $t'$ , attached at its lower end to said lever  $u'$ , and connected at its upper end to the escapement of the striking attachment N, so that whenever said lever  $u'$  and rod  $t'$  are lifted the gong will be sounded. The striking mechanism N may be of ordinary construction, and the rod  $t'$  is substituted for the usual means for operating the escapement of the same, and therefore it is not deemed necessary to extend the description thereof.

For the purpose of changing at pleasure the position of the sheets B relatively with the disk H without removing the drum from the case, I employ an adjustable bearing, F, which is shown on an enlarged scale in Fig. 12. The shaft  $n$  of the drum has a bearing in a slot at the end of a central piece,  $n'$ , that fits and slides in a slot in the sleeve  $n^2$ , which is attached to the side of the case A. This piece  $n'$  is slotted or grooved, to receive the end of a set-screw,  $n^3$ , so that by loosening said screw and sliding the piece  $n'$  farther back the pin  $y^2$  may be disengaged from the slot  $y^3$  without removing the shaft  $n$  of the drum from its bearing at the end of the piece  $n'$ , and when said pin  $y^2$  has been placed in the slot  $y^3$ , into which it is desired to insert it, the piece  $n'$  is drawn out to its former position and again fixed in position by tightening the set-screw  $n^3$ . The slots  $y^3$  correspond, respectively, to the sheets on the drum, and hence the latter can be thus

adjusted to exhibit any particular sheet at a certain time.

What I claim as my invention is—

1. A programme-clock composed of the following parts, namely: an ordinary time-keeping mechanism, D, and dial C, a rotating graduated disk, H, driven by said mechanism, and provided with removable teeth I, a rotating drum, E, holding placards or sheets B, and a striking mechanism, N, said disk H being constructed, as described, to automatically release a suitable escapement at a certain predetermined time, and thereby simultaneously exhibit a specified sheet, B, and sound an alarm, substantially as set forth.

2. In a programme-clock, a disk, H, having radial slots  $e$  formed at regular intervals around its periphery, into which said slots are fitted projecting removable teeth I, in combination with an escapement and with the spring-driven mechanism G, as and for the purpose set forth.

3. The escapement herein described, consisting of the pivoted fly L, driven by the spring mechanism G, and having one end bifurcated and provided with pins  $y$  and  $y'$  at unequal distances from its pivotal center and adapted to operate in connection with a pin,  $w$ , on the lever  $g$ , as set forth.

4. The pivoted fly L, constructed as described, to operate in connection with the lever  $g$ , and provided with the pin  $w'$ , in combination with the lever  $u'$ , rod  $t'$ , striking mechanism N, and rotating drum E, as set forth.

5. The disk S, driven by the spring mechanism G, and provided with a series of equidistant slots,  $y^3$ , corresponding with the series of sheets B on the drum E, in combination with the disk R, fixed on the shaft  $n$ , and provided with the pin  $y^2$ , as and for the purpose set forth.

6. In combination with the disks R and S, constructed as described, the adjustable bearing F, composed of the slotted sliding piece  $n'$ , sleeve  $n^2$ , and set-screw  $n^3$ , as shown and described.

7. In combination with the drum E, and sheets B, having strips  $r$  along their lower edges, the spring-roller  $s s'$ , constructed as described, for the purpose set forth.

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