

(No Model.)

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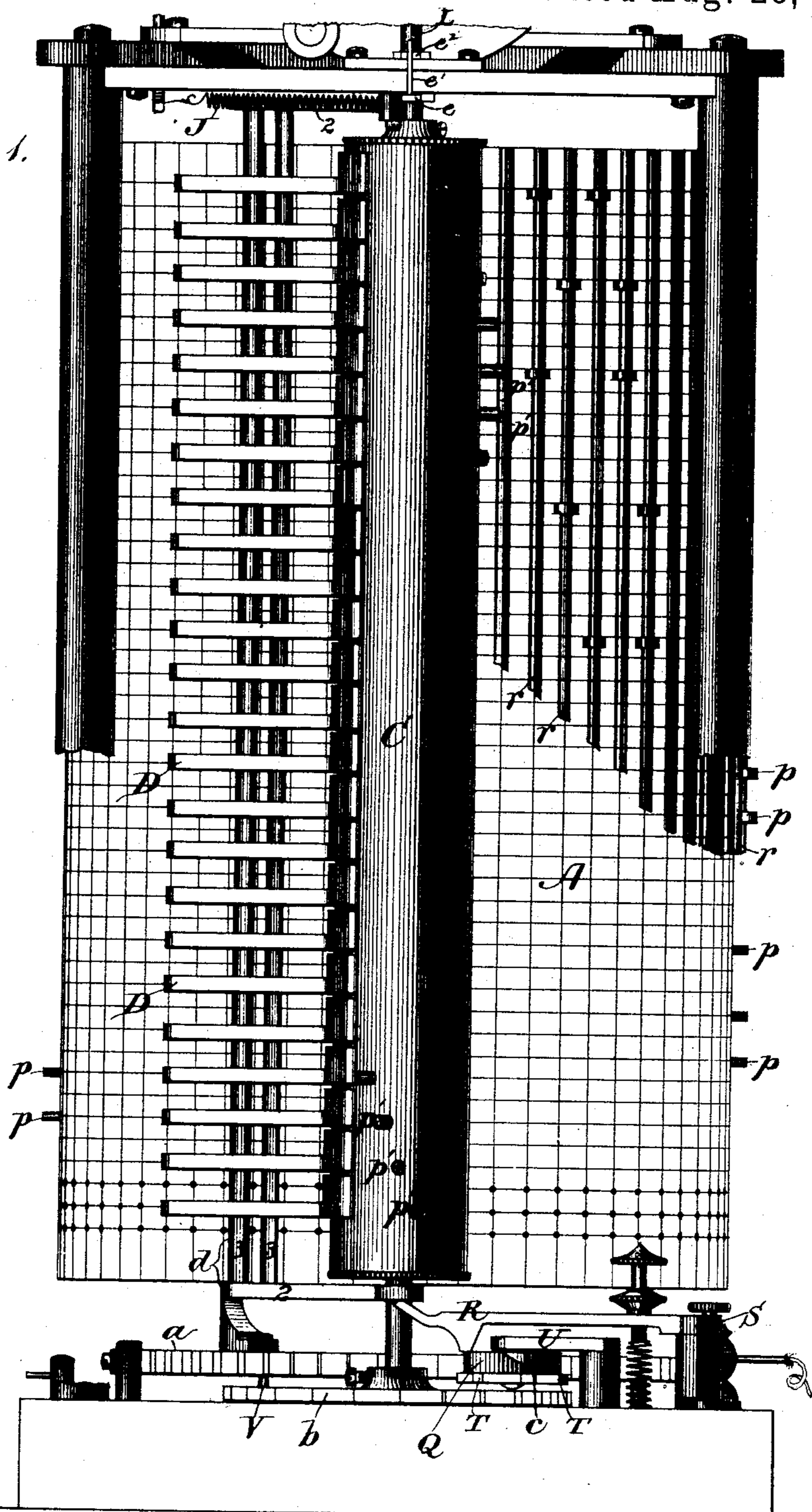
A. D. BLODGETT, R. M. READ, & J. P. TIRRELL.

ELECTRIC SIGNAL FOR RAILWAY STATIONS.

No. 284,114.

Patented Aug. 28, 1883.

Fig. 1.



WITNESSES.

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(No Model.)

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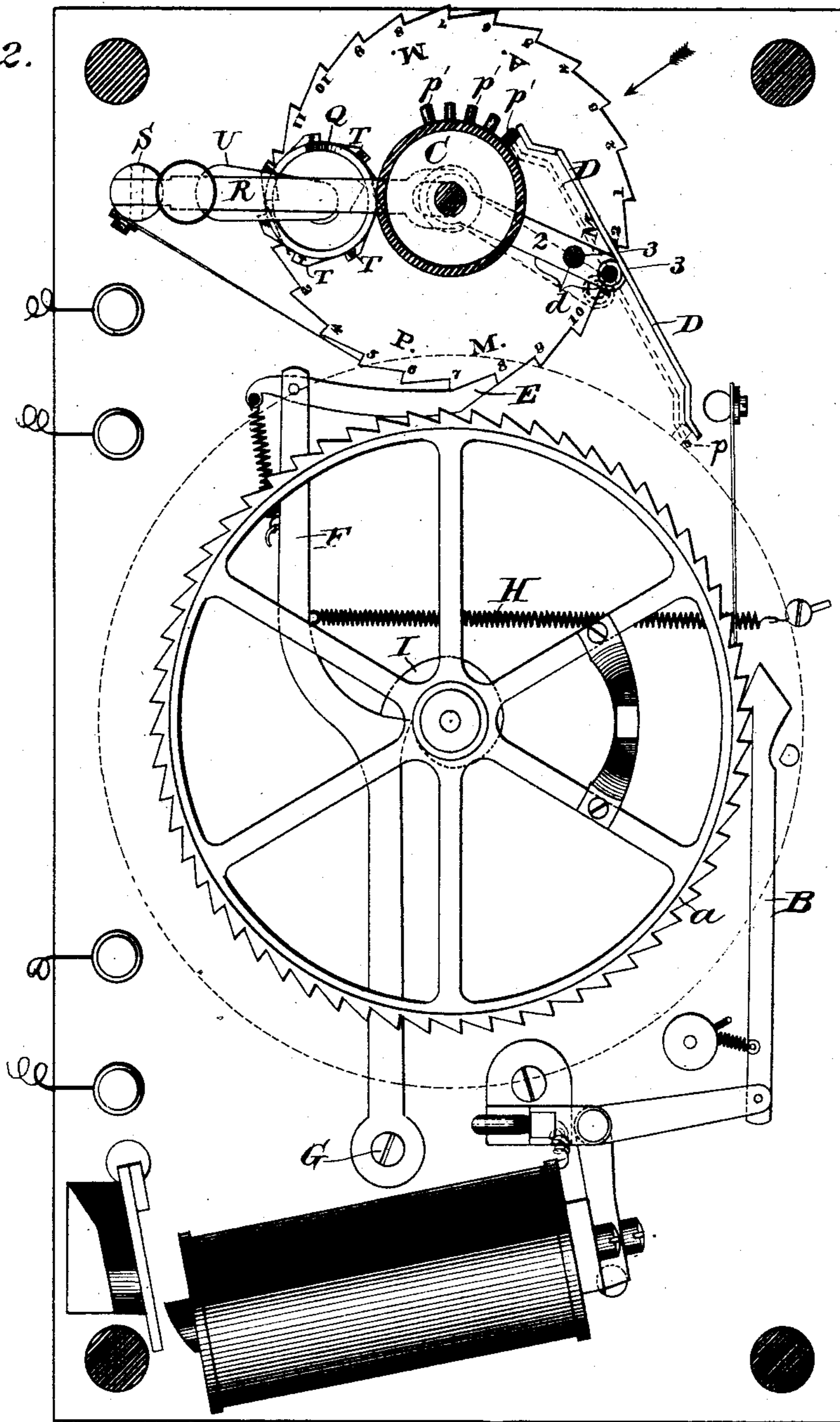
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Fig. 2.



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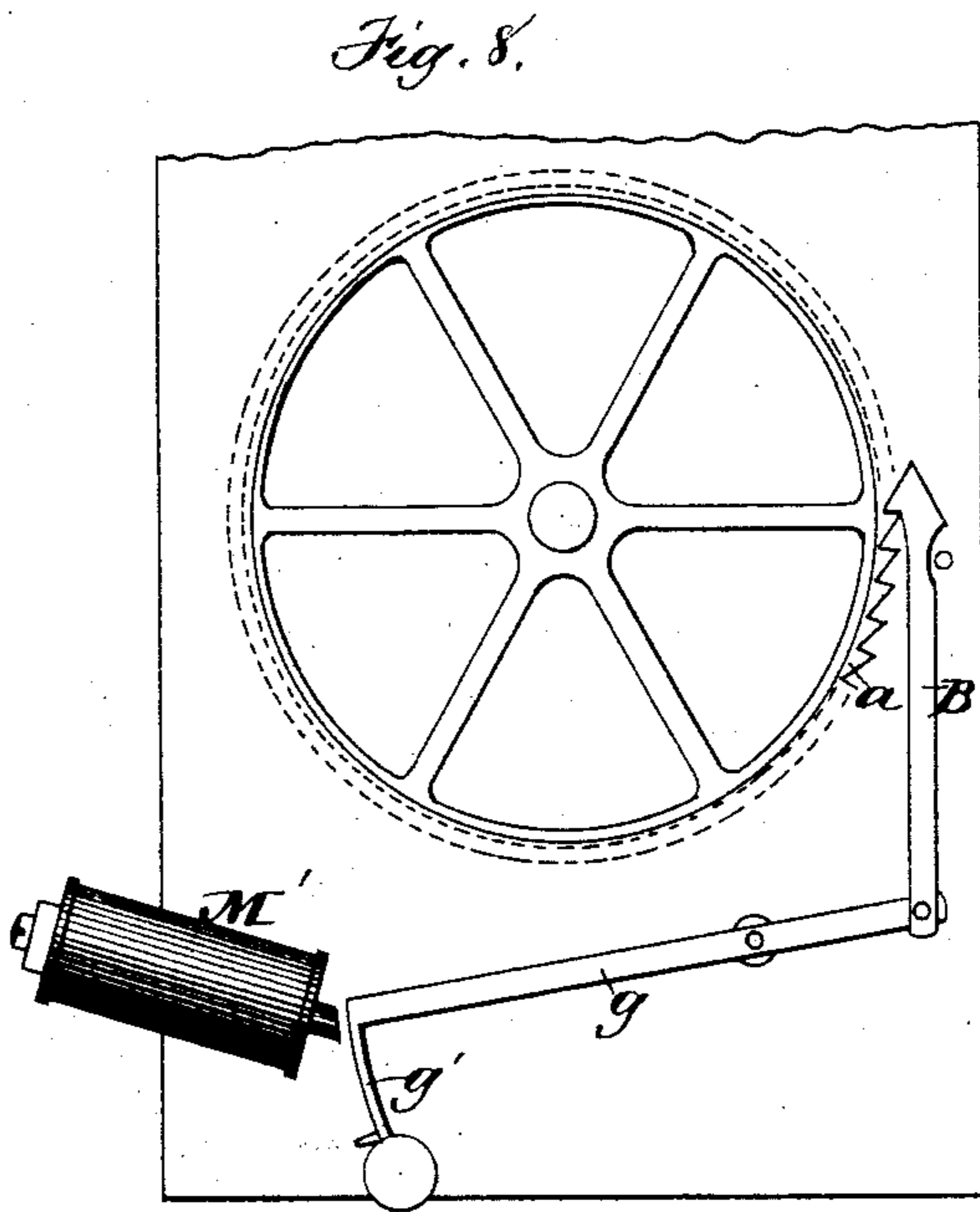
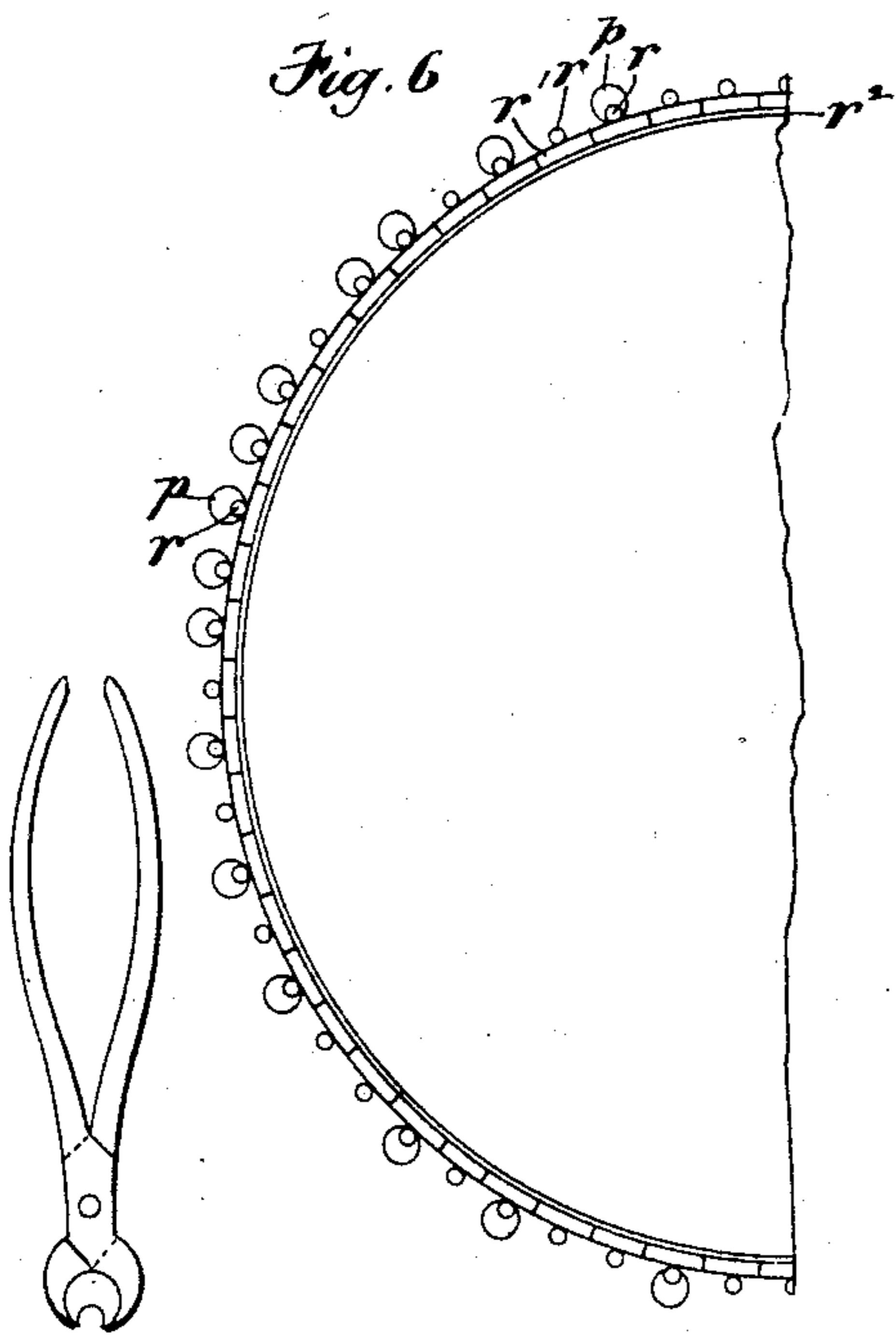
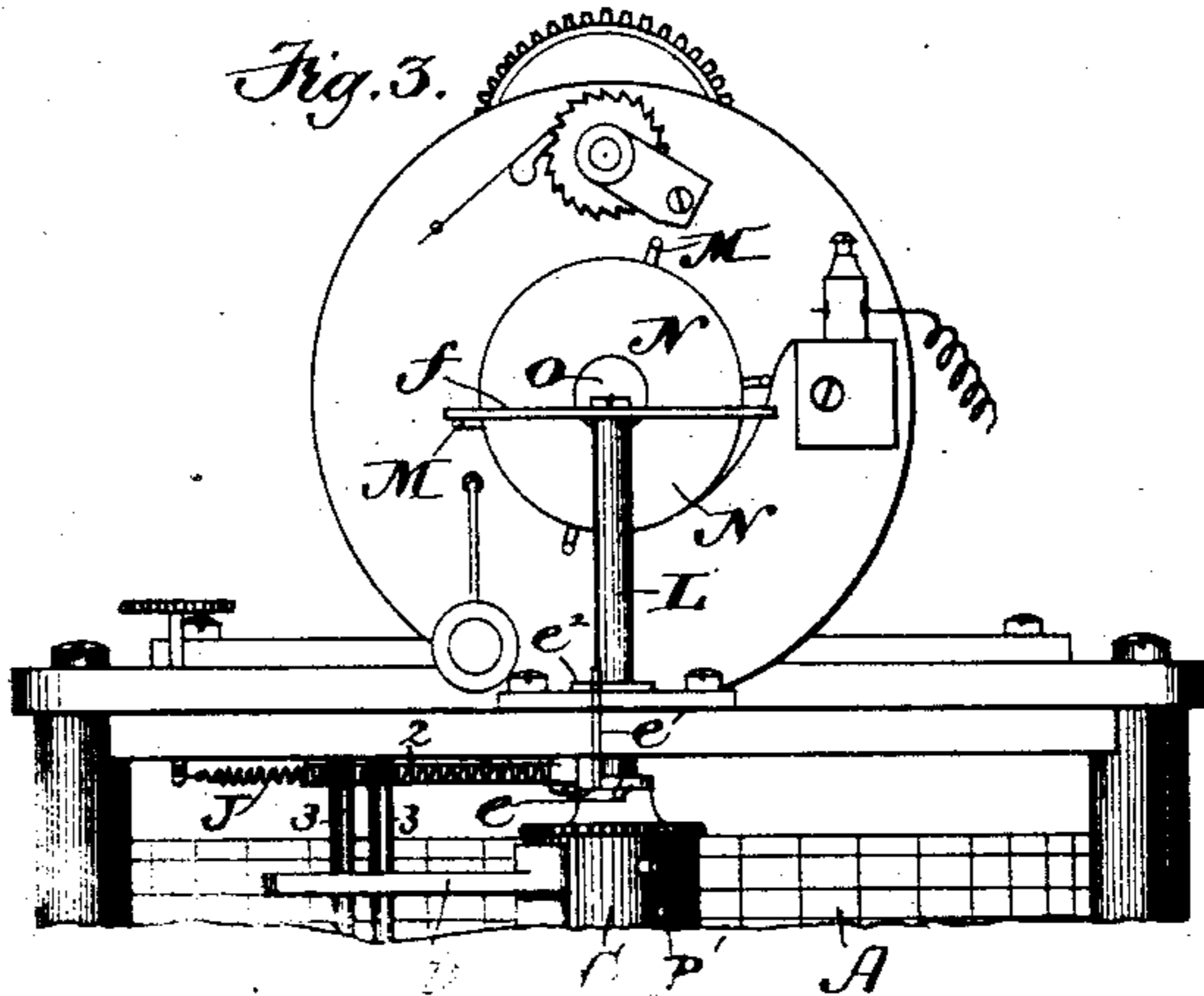
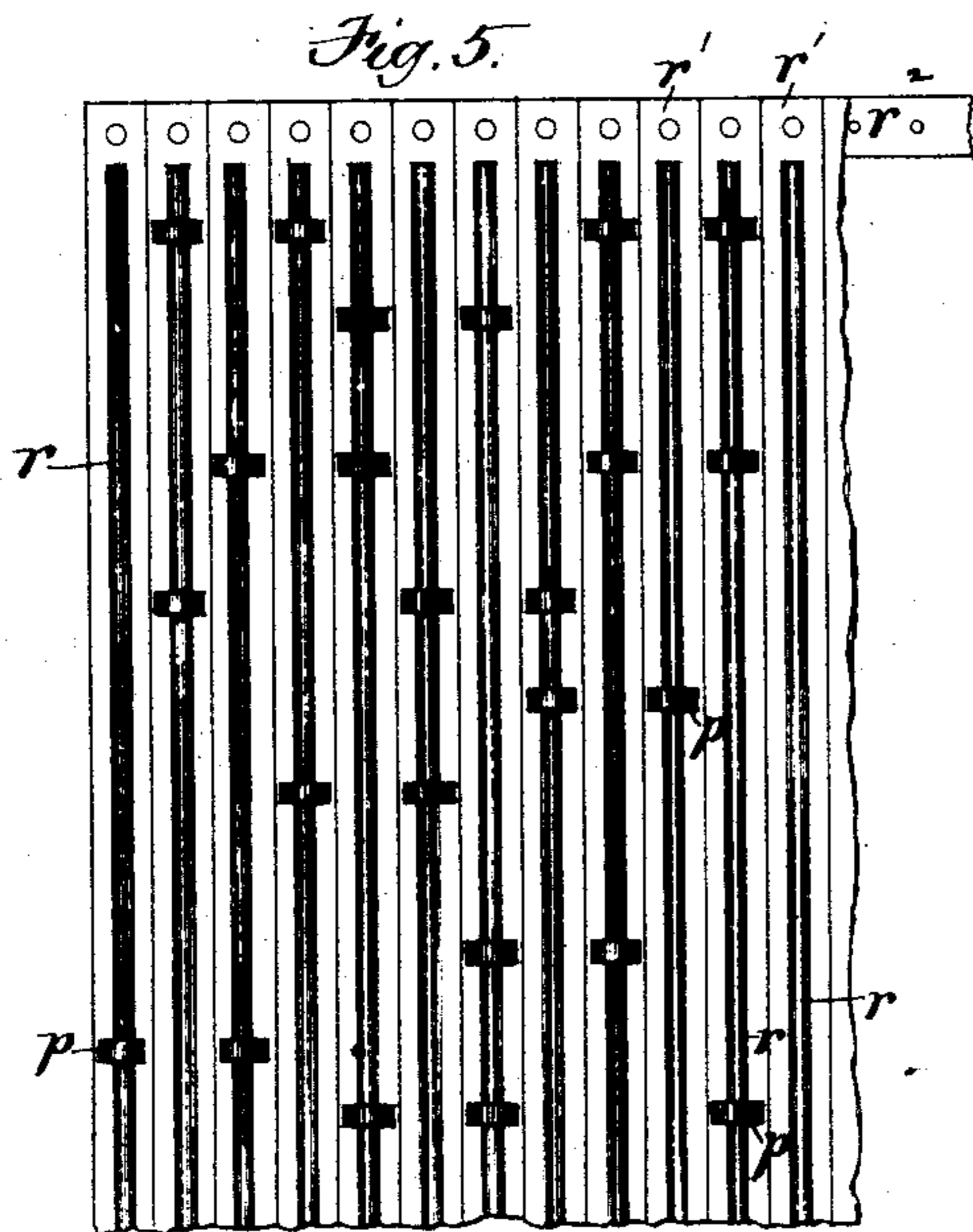
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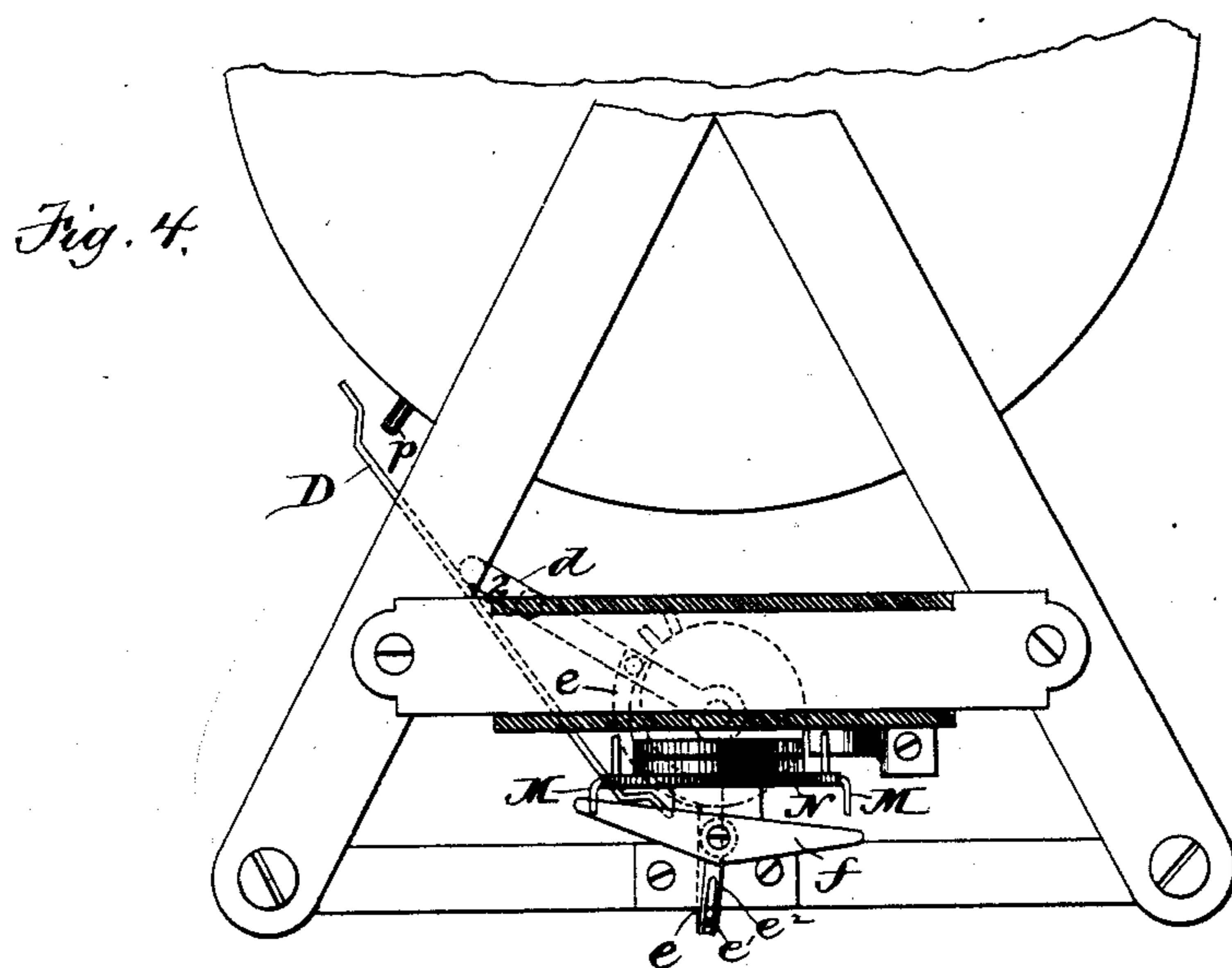
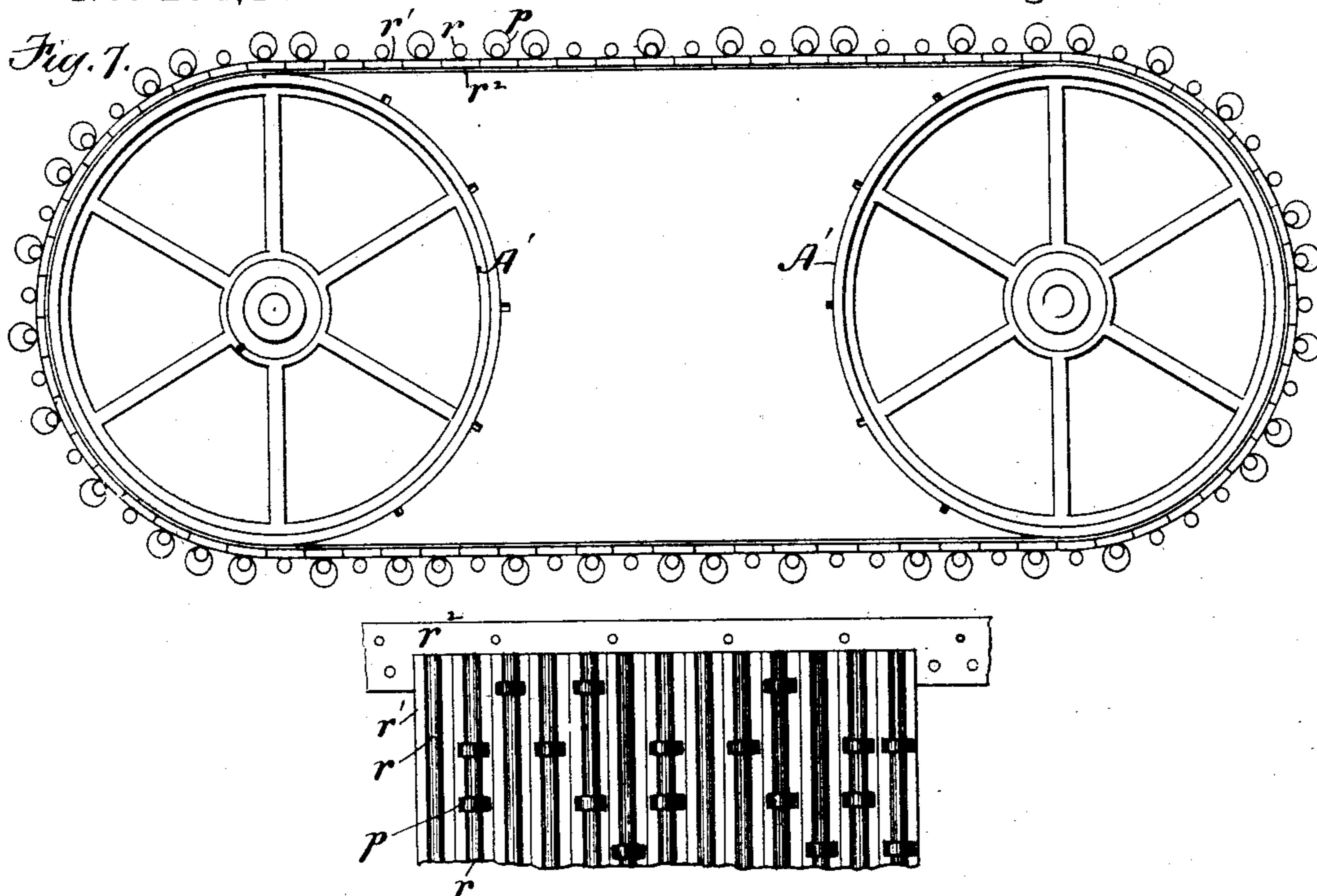
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UNITED STATES PATENT OFFICE.

AARON D. BLODGETT, OF BOSTON, ROBERT M. READ, OF CAMBRIDGE, AND
JACOB P. TIRRELL, OF BOSTON, MASSACHUSETTS.

ELECTRIC SIGNAL FOR RAILWAY-STATIONS.

SPECIFICATION forming part of Letters Patent No. 284,114, dated August 28, 1883.

Application filed December 20, 1882. (No model.)

To all whom it may concern:

Be it known that we, AARON D. BLODGETT, of Boston, in the county of Suffolk and State of Massachusetts, ROBERT M. READ, of Cambridge, in the county of Middlesex and State of Massachusetts, and JACOB P. TIRRELL, of said Boston, have invented certain Improvements in Electric Signals for Railway-Stations, of which the following is a specification.

10 This invention is an improvement on the electric signal described in Letters Patent No. 261,928, to G. W. and A. D. Blodgett, and No. 263,281, to G. W. and A. D. Blodgett and J. P. Tirrell.

15 In the apparatus described by said patents a circuit is closed through a signal-bell at any predetermined intervals of time, so that a series of signals is automatically given in any desired order. In Patent No. 263,281 the conditions are automatically changed at the close of six days, so that a different order of signals is given on Sunday from week days.

20 The present invention has for its object to provide an improved apparatus for producing the same results as those above described, in which the circuit shall be closed at the desired periods through the signal-bell by the action of a time mechanism of novel construction.

25 Our invention consists in the several improvements hereinafter described and claimed.

30 Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of the mechanism embodying our invention. Fig. 2 represents a plan of the lower portion of said mechanism, the cylinder being removed and the drum with spirally-arranged pins being shown in section. Fig. 3 represents a side elevation of the upper portion of the apparatus. Fig. 4 represents a top view of certain details. Figs. 5, 35 6, and 7 represent views showing an improved manner of supporting the projections *p*. Fig. 8 represents an improved arrangement of the armature of an electro-magnet for actuating a part of the mechanism.

40 The same letters of reference indicate the same parts in all the figures.

In the drawings, A represents the vertical cylinder having parallel peripheral rows of

holes, forty-eight in number, each row having 50 sixty holes. The number of rows is equal to twice the number of hours in one day, so that there are twenty-four rows for week-day use and the same number for Sunday use as in said Letters Patent No. 263,281. In the present case, 55 however, the rows of holes for Sunday use alternate with the rows for week-day use, instead of being grouped by themselves at one end of the cylinder, as in said patent. Pins or projections *p* are placed in said holes in any desired order, according to the order of signals 60 to be given. The cylinder is rotated one step in each minute by a pawl, B, operated either by a pivoted electro-magnet, as shown in Fig. 2, or by a pivoted armature-lever, *g*, as shown 65 in Fig. 8, said pawl engaging with a ratchet, *a*, having sixty teeth, and suitably secured to the cylinder.

C represents a drum journaled in the frame which supports the cylinder A, and provided 70 with twenty-four pins, *p'*, arranged spirally, said pins coinciding with the alternate rows of pins *p*. The drum C is rotated one step in each hour, so as to make a complete rotation every twenty-four hours, by a pawl, E, 75 engaging with a ratchet, *b*, having twenty-four teeth, affixed to the arbor of the drum C. The pawl E is pivoted to a lever, F, which is pivoted at G to the base of the supporting-frame, and is pressed by a spring, H, against a cam, 80 I, on the arbor of the ratchet *a*. Said cam is adapted to move the pawl E backwardly a distance equal to the length of one of the teeth of the ratchet *b*, and then release said pawl, this movement being effected once during each 85 complete rotation of the ratchet *a*.

d represents a swinging frame, composed of horizontal arms 2 2, pivoted to the arbor of the drum C, and vertical rods 3 3, connecting said 90 arms.

Upon one of the rods 3 is journaled a series of twenty-four levers, D, coinciding with the pins *p'*, each lever being independent of the others, and adapted to oscillate loosely on the supporting-frame. The levers D are so arranged 95 that one end of each lever can come in contact with a pin, *p*, and the opposite end with a pin, *p'*. The frame *d* is held normally

by a spring, J, in the position shown in dotted lines in Fig. 2, and when a pin, p , and pin p' come at the same time in contact with the ends of a lever, D, the frame d is swung outwardly
 5 by the movement of said pins to the position shown in full lines in Fig. 2. The movement thus given to the frame d causes an arm, e , attached to the upper arm, 2, of said frame, and carrying a pin, e' , to move a slotted arm, e'' , which
 10 receives said pin, and thereby partially rotate a spindle, L, to which the arm e'' is attached. The spindle L is journaled in the supporting-frame, and has attached to its upper end a transverse bar or detent, f , (see Figs. 3 and 4,) which is oscillated by the movement of the
 15 frame d , induced by the pins p p' and spring J. The oscillations of the detent f cause it to alternately release and arrest pins M on a drum, N, attached to an arbor, O, which is impelled by suitable clock-movement, and carries a circuit breaking and closing drum or disk, whereby an electric circuit is alternately closed and broken through a signal-bell, in the manner fully described in the patents above
 25 referred to, said circuit-breaker being of well-known construction, and forming no part of the present invention. It will be seen that each pin p' is brought in succession into position to co-operate with a row of pins, p , in the manner above described, and held in such position one hour, so that during each hour the circuit will be closed as many times as there are pins p in the row with which the operative pin p' coincides. At each partial rotation of
 35 the drum C another pin, p' , is brought into operative position, and the one that was before operative is made inoperative. This arrangement enables different signals to be given during each hour of the day and night without the employment of a contact point or electrode which is moved vertically, step by step, once each hour, and allowed to fall at the end of every twenty-four hours, as in the above-named patents.
 45 The frame d and its levers D are vertically movable to such an extent that the levers can be moved a distance equal to the space between each row of holes in the cylinder A and the next row, so that the levers can be shifted
 50 from the alternate rows devoted to week-day use to those devoted to Sunday use. During the week days the frame d and its levers are supported in the position shown in Fig. 1 by a cam, Q, which is a ring or disk journaled
 55 in an arm or bracket, U, over the ratchet b , and provided with a notch or recess, c , occupying one-seventh of its circumference. A lever, R, pivoted at S, rests on the edge of said ring or cam, and supports the frame d . When
 60 the notch c coincides with the lever R, the latter drops into said notch and lowers the frame d sufficiently to move the levers from one series of holes to the alternating series. The cam Q is provided with seven ratchet-teeth, T, which are successively engaged by a pin, V, on the ratchet b , the cam being therefore

rotated one-seventh of an entire rotation by each complete or daily rotation of the ratchet b . The change from week-day to Sunday time is therefore automatically effected. The next
 70 partial rotation of the cam Q after the depression of the frame causes the beveled side of the notch c to raise the frame and levers to their former position.

In Figs 5, 6, and 7, and in the upper right-hand corner of Fig. 1, we have shown a different form of the projections p and a different mode of supporting the same. Instead of making said projections in the form of pins and inserting them in holes, we in this in-
 80 stance make them in the form of collars recessed at one side, and adapted to be compressed by a suitable tool upon vertical rods or ribs r , which are secured to a flexible support composed of vertical strips or sections r' , riv-
 85 eted to flexible bands r'' , which are adapted to be secured to a cylindrical frame or support, as shown in Fig. 6, or to be placed upon sprocket-wheels A' A', as shown in Fig. 7. The flexible support may be removed from
 90 the cylinder or other supporting means when it is desired to adjust the projections p . Said projections may be loosened by giving them a slight tap to overcome their compression. The flexible support should be graduated and
 95 marked to guide the operator in varying the projections p .

In Fig. 8 we have shown, as a means for operating the ratchet a , a fixed electro-magnet, M', and an armature, g' , formed on the end of
 100 a horizontally-oscillating lever, g . The armature g' presents a convex surface to the poles of the magnet, which surface is eccentric to the pivot of the lever g , and is so arranged that it always is in close proximity to
 105 the poles of the magnet. The movement of the armature toward the poles of the magnet causes the latter to move in a direction nearly parallel with the surfaces of said poles, but converging slightly toward the same, so that
 110 the attractive force of the magnet will gradually increase as the armature swings inwardly. We have found that by this arrangement a marked increase of power is obtained over the ordinary arrangement, in which the arma-
 115 ture moves directly toward and from the poles of the magnet.

We claim—

1. In an electric signal for the departure of railway-trains, the combination of a mechan-
 120 ically-impelled circuit breaker and closer located in a circuit which includes a signal-bell, and a time mechanism for releasing and arresting the circuit-breaker at predetermined intervals, said mechanism consisting in a series of pins or projections, p , arranged, as described, on a cylinder or equivalent support, rotated or moved one step in each minute, a drum having spirally-arranged pins or projections, p' , located as described with relation to the
 125 pins p , and rotated one step in each hour, a series of levers supported by a swinging frame,

and adapted to be moved with said frame by the joint action upon either of said levers of a pin, *p*, and a pin, *p'*, and a detent operated by said swinging frame to hold or release the circuit breaker and closer, as set forth.

2. In an electric signal, the combination of a circuit breaker and closer, a cylinder or equivalent support having a series of pins or projections, *p*, and rotated one step each minute, a drum having spirally-arranged pins or projections *p'*, and rotated one step each hour, a series of levers supported by a swinging frame and adapted to be moved by the joint action of two pins to operate a detent, and automatic mechanism for supporting said series of levers in one position for six days and in a different position on the seventh day, whereby said levers are adapted to co-operate with a different arrangement of pins or projections on the seventh day, as set forth.

3. In an electric signal, a cylinder or equivalent support, as specified, adapted to be rotated or moved step by step, and provided with a series of parallel rods, *r r*, adapted to support collars or projections *p*, as set forth.

4. In an electric signal, a chain or flexible sectional band adapted to be supported on a cylinder or its specified equivalent, and composed of vertical sections or strips secured to flexible connecting-bands, and each provided with a longitudinal rod or rib adapted to receive collars or projections *p*, as set forth.

5. In an electric signal, a cylinder or its specified equivalent, having the rods or ribs *r*, provided with collars *p*, adapted to be secured at any desired point on said rods or ribs by compression, as set forth.

6. The combination of the cylinder-rotating ratchet *a*, having sixty teeth, the cam *I*, rotating with said ratchet, the secondary cylinder or drum rotating ratchet *b*, having twenty-four teeth, means for rotating the ratchet *a* one step each minute, a dog, *E*, adapted to engage with the teeth of the ratchet *b*, and a le-

ver, *F*, pivoted at one end to a fixed support, and supporting the ratchet *E* at its free end, and held by a spring against the cam *I*, whereby the dog *E* is alternately retracted and released against the ratchet *b* once during each complete rotation of the ratchet *a*, as set forth.

7. In an electric signal, the combination of the cylinder *A*, having pins or projections, arranged as desired, and having on its arbor a ratchet, *a*, having sixty teeth, the drum *C*, having pins arranged spirally, and having on its arbor a ratchet, *b*, having twenty-four teeth, the vertically-movable swinging frame *d*, adapted to be oscillated, as described, by the joint action of the pins on the cylinder and drum, the cam adapted to support the frame *d* at different heights, and provided with seven teeth, means for rotating the ratchet *a* and cylinder *A* one step each minute, and devices, substantially as described, whereby the ratchet *b* and drum *C* are moved one step during each complete rotation of the ratchet *a*, and the cam *Q* is rotated one step by each complete rotation of the ratchet *b*, as set forth.

8. The swinging lever-frame *d*, oscillated at predetermined intervals, as described, and provided with an arm, *e*, at its upper end, combined with the oscillatory detent *f*, having a slotted arm, *e'*, receiving a pin on the arm *f*, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 13th day of December, 1882.

AARON D. BLODGETT.
ROBERT M. READ.
JACOB P. TIRRELL.

Witnesses to R. M. Read:

C. F. BROWN,
CANDACE C. READ.

Witnesses to A. D. Blodgett and J. P. Tirrell:

C. F. BROWN,
A. L. WHITE.