

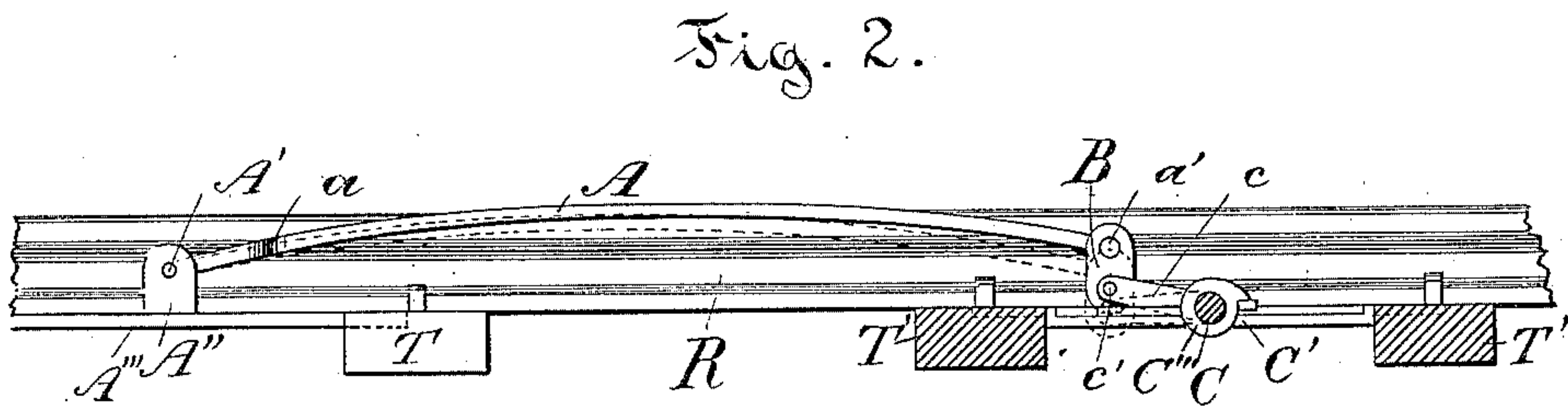
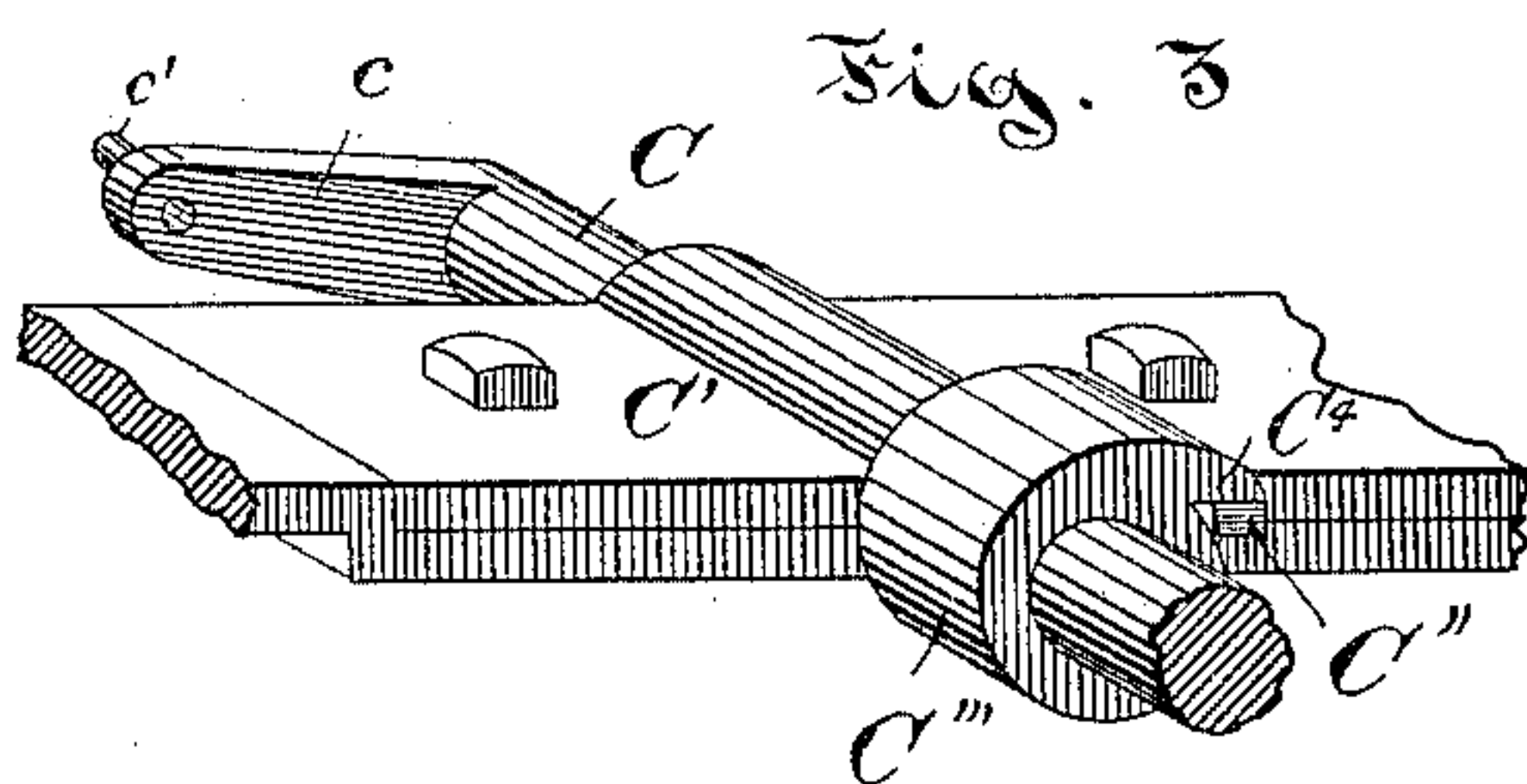
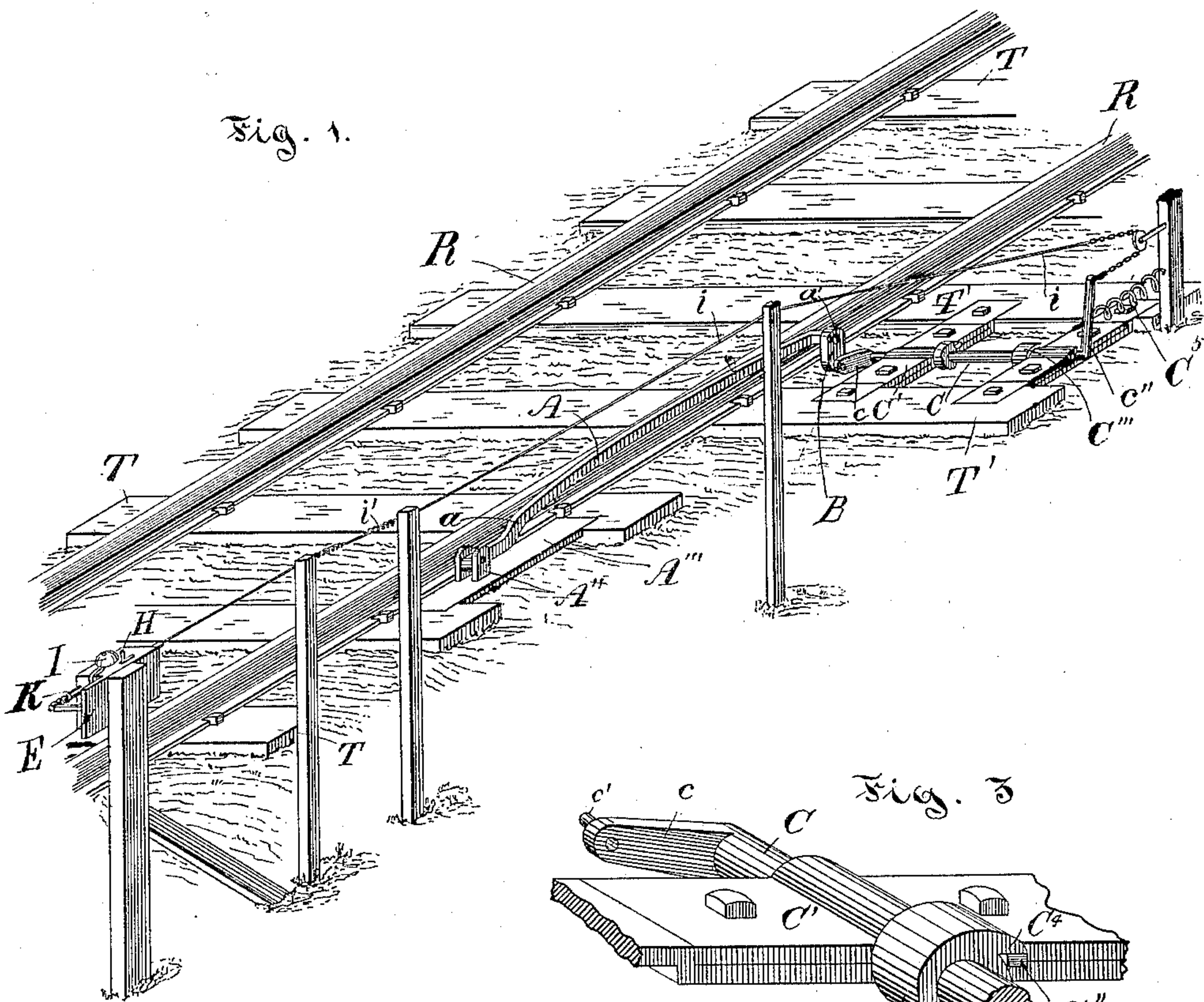
(No Model.)

2 Sheets—Sheet 1.

D. GRANT.
RAILWAY SIGNAL.

No. 463,122.

Patented Nov. 10, 1891.



Witnesses:

Chas. Raley.

R. N. Legendre.

Daniel Grant.

Inventor

By A. Harvey

Attorney.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

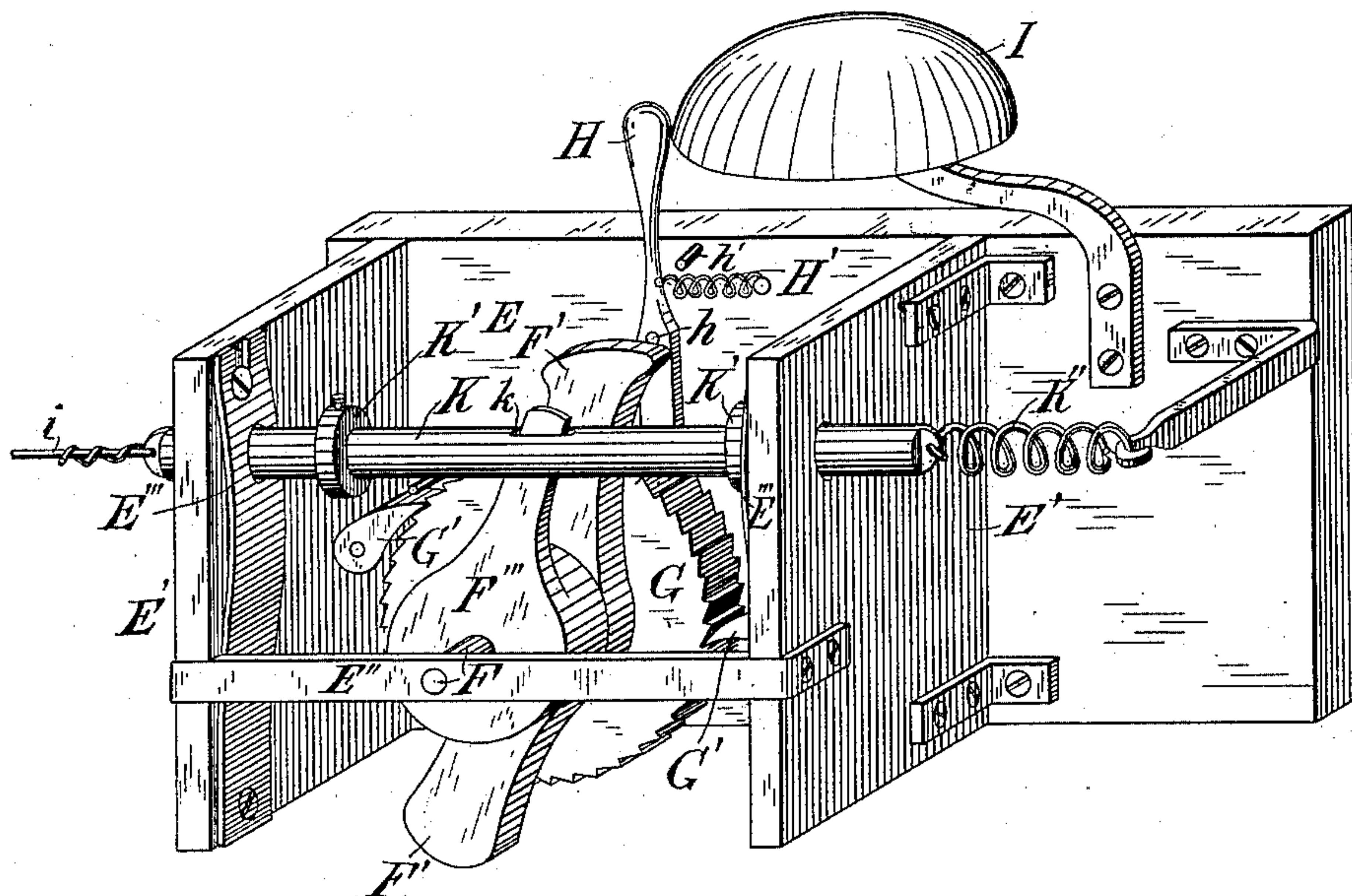


Fig. 5.

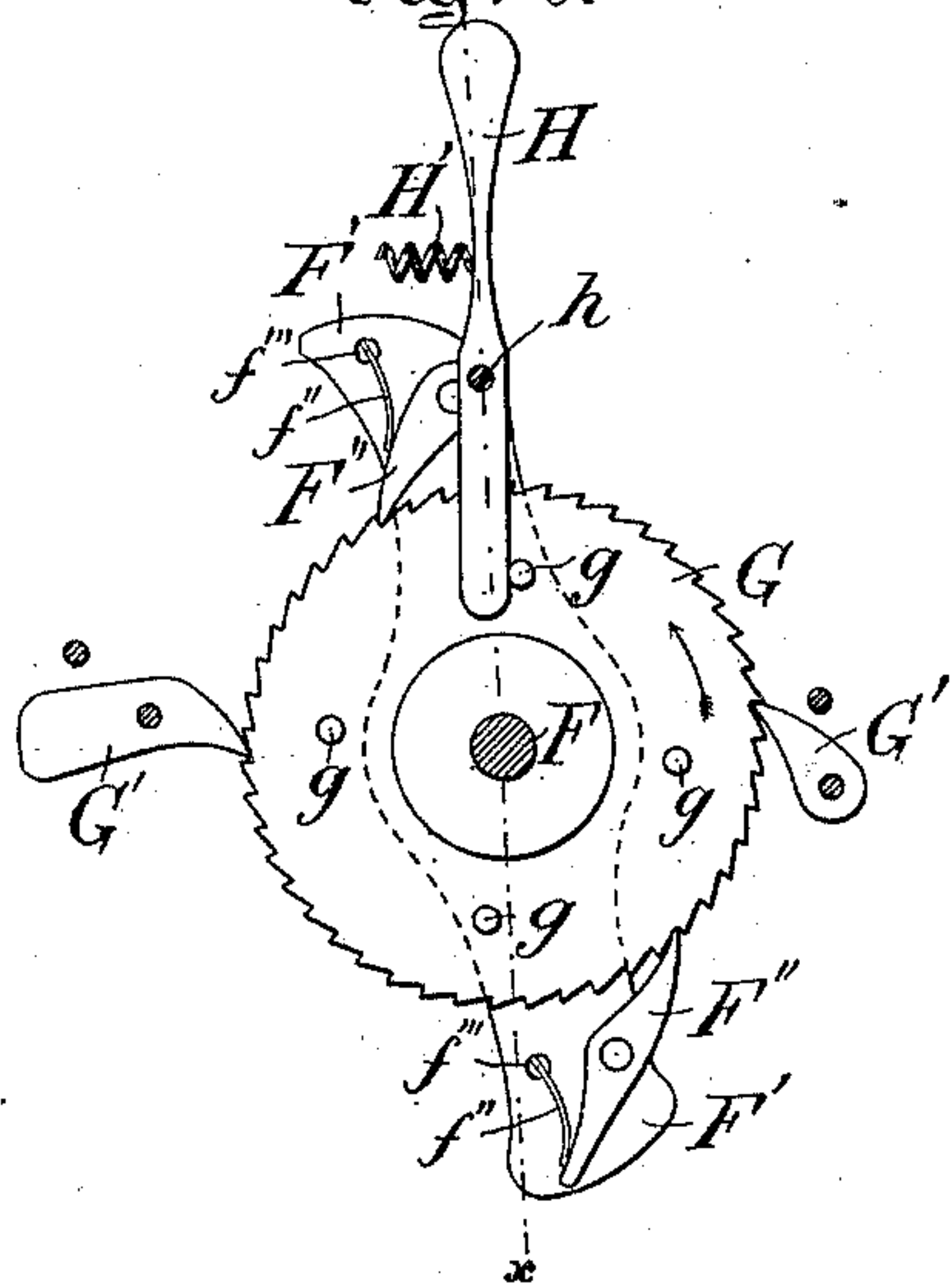
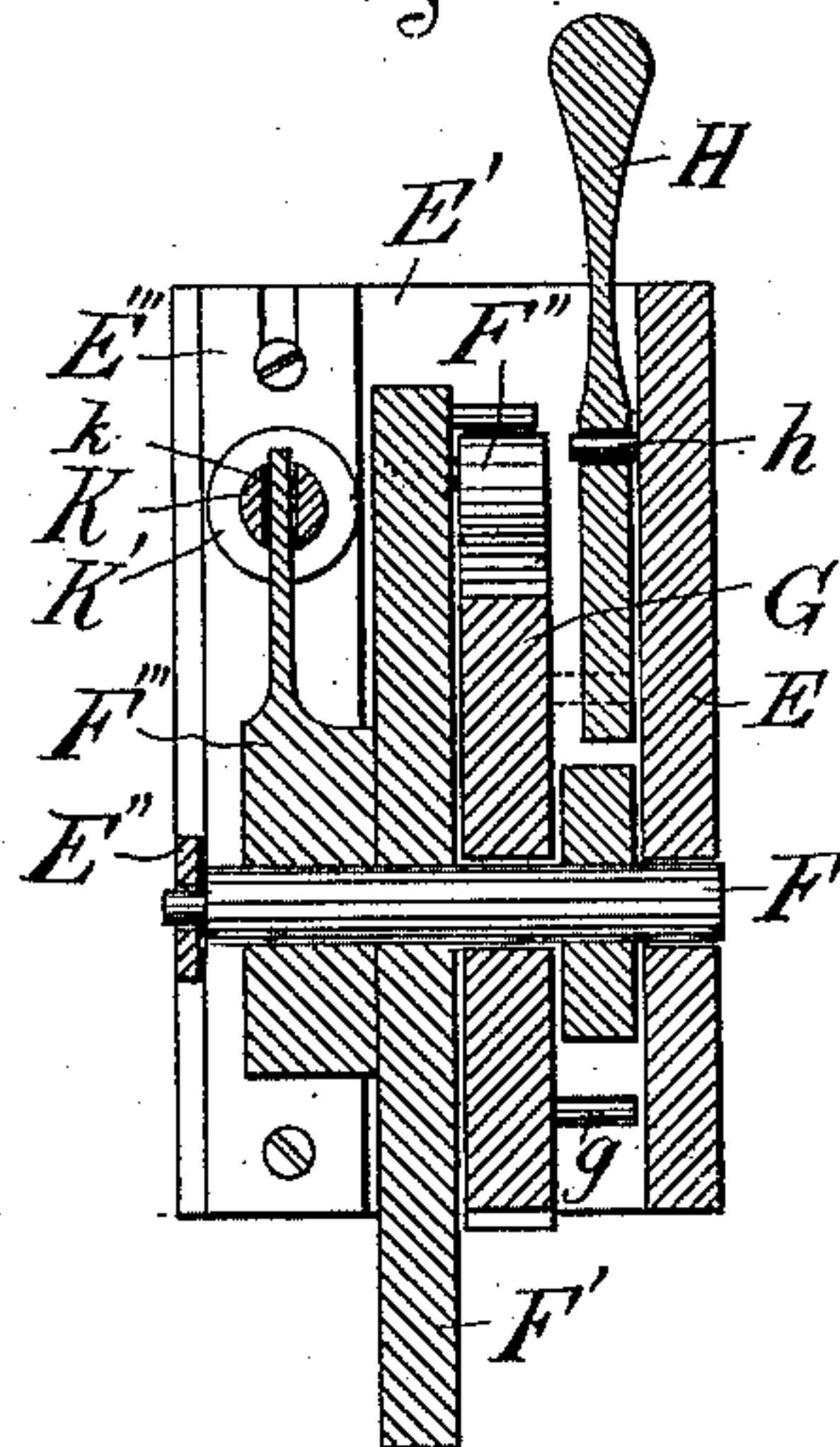


Fig. 6.



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UNITED STATES PATENT OFFICE.

DANIEL GRANT, OF BATH, CANADA, ASSIGNOR OF ONE-HALF TO RODERICK KENNEDY, HENRY ARMSTRONG, ADDERLY VANSLYCK, EMERSON BURLEY, CHARLES PHIPPEN, THOMAS BAIN, SAMUEL D. WILLIAMS, CHARLOTTE ROGERS, CHARLES P. WEMP, AND MAXWELL ROBINSON, ALL OF SAME PLACE.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 463,122, dated November 10, 1891.

Application filed October 31, 1889. Serial No. 328,820. (No model.)

To all whom it may concern:

Be it known that I, DANIEL GRANT, of Bath, in the Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in Automatic Railway-Signals; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part hereof.

My invention, which will be hereinafter fully set forth and claimed, relates to devices for railways, by means of which a train, or part of one, passing over said device will automatically signal its approach to and at a distant crossing or station.

The object of my invention is a device in which the operating parts are of such a nature as to act effectually and will withstand and endure the very severe wear and tear to which they are unavoidably subjected by the passing wheels; further, to provide the means in such apparatus for sounding the bell or gong only once for any given number of wheels passing over the operating parts.

I have found that in signaling devices which depend for their operation upon parts that come in contact with the wheel-tires and are struck and deflected by the latter in some manner or other it is exceedingly difficult and has hitherto been practically impossible to make those parts sufficiently delicate for effective action and at the same time sufficiently strong to withstand the wear and tear; also, that in fast-moving trains the sound of the bell or gong becomes more or less ineffectual if struck for every passing wheel. These difficulties I overcome by my invention, which will be hereinafter described and claimed.

Figure 1 is a perspective view of a section of a railway-track to which my improved signaling device is applied. Fig. 2 is an elevation of the depression-lever on a larger scale, the dotted lines showing its position when depressed. Fig. 3 is a perspective view of a portion of the rocking shaft with collar and bearing. Fig. 4 is a perspective view of the bell-striking mechanism on a larger scale. Fig. 5 is a reverse view of the operating parts of

the same. Fig. 6 is a transverse vertical section of the same on line $x x$.

R R, Figs. 1 and 2, are the two rails of a railway-track secured upon the ties T.

A is a long depression-lever pivoted at one end by a pin A' between the two lugs of a bracket A'' , which is secured close to the outside of the rail upon a tie, or, as in the drawings, upon a sill A''' , specially provided for the purpose and secured to two ties. The lever A has a bend α near its pivoted end to allow room between it and the rail for the lug of the bracket A'' , and yet allow the main body of said lever to lie close along the rail. The upper surface of the pivoted end of the lever A is set a little below the upper surface or level of the rail R, and said lever is so curved longitudinally and in a vertical plane that it gradually rises a little (about three-eighths of an inch) above the rail-level, and then with an easy curve sinks again gradually a little below said rail-level at its free end. The latter is bent horizontally at a right angle or otherwise shaped to form a pin a' .

C is a rocking shaft disposed at a right angle to and outside of the rails R and is journaled in bearings C' . Said rocking shaft has a crank c at one end, with a crank-pin c' reaching to a point vertically, or nearly so, below the pin a' and connected with the latter by a short link B. The other (outer) end of said rocking shaft has a longer crank or lever c'' , the two cranks $c c''$ being disposed at about a right angle to each other, and may either be formed integrally with the shaft or rigidly attached to the same. The rocking shaft C is held longitudinally by collars C''' , rigidly secured upon said shaft and placed close against the bearings C' . The latter have lateral lugs or stops C'' close to and projecting along the said collars and adapted to be struck by lugs or stops C^4 on the latter, thus limiting the oscillating action of the rocking shaft and holding the same in a fixed position when at rest.

C^5 is a spring secured to the lever c'' and a post or other suitable object, which draws the said lever toward one side, keeping the stops

C'' and C⁴ in contact when at rest and raising the depression-lever A by means of the rocker C and link B after each depression. When at rest, the crank c makes an angle with the horizontal, so that the crank-pin c' is as much above the horizontal drawn through the center of the shaft as it will be below when the lever A is depressed. The bearings C' are secured to suitable ties or sills T'. To the upper end of the lever c'' is attached the bell cord or wire i, connecting the distant bell or gong I, supported upon suitable stakes or poles and having spiral springs i' inserted to take up the slack and compensate for expansion and contraction in said wire i.

The striking apparatus, Figs. 4, 5, and 6, is constructed as follows: E is a back plate carrying and forming a part of the framing E' E''. In this frame is journaled a rocking shaft F, carrying a double rocking lever F', and which has journaled upon it the ratchet-wheel G. The rocking lever F' has pivoted near its ends pawls F'', which gear into the ratchet-wheel G, being pressed into gear by springs f'', held on the pins f'''. Stationary pawls G', gearing into the ratchet-wheel G and pressed into gear by a spring or weight, are also pivoted to the back plate E. The rear of the ratchet-wheel G is studded with a series of pins g, set equidistant in a circle, Fig. 5, adapted to operate the lower end of the striker. The striker H is pivoted to the back plate by a pivot h close to the back of the ratchet-wheel G, its lower end extending into the circle of pins g and swept by the latter and its upper end drawn toward the bell by a spring H' and limited by a pin or stop h'.

I is the bell or gong suitably supported.

K is a bar or rod fitted to slide freely in bearings in the frame-pieces E' above the rocking shaft F, provided with adjustable collars K', limiting the traverse and acting as buffers against the springs E''. The traversing rod K is connected with the rocking lever F' by a lever F''', fast on the rocking shaft and passing through a slot k in said traversing rod or in any other suitable manner in which the motion of said rod can be imparted to the rocking lever F'. Said traversing rod is provided at one end with means of connecting it to the bell cord or wire i and at the other with a spring K'', which draws the same in the direction opposite to that of the cord i.

The apparatus operates as follows; When rolling-stock is passing over the rails R, each wheel of the same passing over the rail on which the depression-lever A is placed depresses the same and presses down the crank c by means of the link B, thus moving the rocking shaft C, and with it the lever c'', against the tension of the spring C⁵, thus pulling the bell-cord i. The latter draws the rod K against the tension of the spring K'' and by means of the lever F''' moves the rocking lever F', together with the pawls F'', pivoted thereon, the latter sliding over one or more of the teeth of the ratchet-wheel G, which is pre-

vented from moving in that direction by the pawls G'. The pull on the cord i ceasing and the cord relaxing after a wheel has passed over the lever A, and the latter having been raised again by the spring C⁵, the spring K'' draws back the rod K, taking with it the lever F''' and the rocking lever F', with the pawls F'', which latter engage the teeth of the ratchet-wheel G, giving to it a corresponding part of a turn. Thus, while the wheel G makes part of a rotation for each pull on the cord, corresponding to the passage of a wheel over the lever A, one of the pins G bears against the striker H, near its lower end, until after repeated movements of the wheel the pin G slips past the end of the striker and allows the spring H' to jerk the striker against and strike the bell I, thus giving a one-stroke signal. The traverse of the rod K may be regulated by the position of the collars K' upon the rod K, thus enabling the pawls F''' to take one or more teeth of the wheel G at each movement and thus enabling the mechanism to be set so as to give, within certain limits, a stroke on the bell for any given number of passing wheels.

I claim as my invention—

1. In an automatic railway-signal, the combination of a long slightly-curved depression-lever A, pivoted at one end to a fixed support outside the track and close to the rail and rising at its highest point slightly above the rail, a bracket A'', supporting one end of said lever pivotally, a rocking shaft C, having a crank c, with pin c', and a crank or lever c'', set at a right angle, a link B, connecting said lever at the free end by the pin a' and the rocking shaft by the pin c', the bearings C', carrying said rocking shaft and provided with stops C'', collars C''' upon said shaft, provided with stops C⁴, and the spring C⁵, controlling the lever c'' and keeping the stops C'' and C⁴ in contact, substantially as set forth.

2. In an automatic railway-signal, the combination of a lever A, placed outside the track close to the rail and pivotally supported at one end, a link B, connecting the free end to the crank of a rocking shaft, a rocking shaft C, having a crank c, connected by the link B to the lever A and having a long crank or lever c'', bearings C', supporting the shaft C and having stops C'', collars C''' upon said shaft and having stops C⁴, a spring C⁵, drawing the lever c'' to one side and the shaft against the stops, the bell-cord i, with the springs i', and a bell or gong I, with suitable striking apparatus, substantially as set forth.

3. In a striking apparatus of an automatic railway-signal, the combination of a frame E' E'', a rocking shaft F, with rocking lever F' and spring-pawls F'', journaled in said frame, a ratchet-wheel G, journaled upon said rocking shaft, adapted to be turned in one direction by the pawls F'', pawls or detents G', pivoted to said frame and adapted to prevent said ratchet-wheel from turning back, pin g on said ratchet-wheel, adapted to oper-

ate a striker, a striker H, pivoted to said frame E and adapted to be operated by said spring *g*, a spring H', drawing said striker against the bell, a bell I, adapted to be struck by said striker, a traversing bar K, having adjustable collars K', adapted to slide in the frame E', a spring K'', drawing the bar K in one direction, the bell-cord *i*, adapted to draw the bar K in the opposite direction, and means of connecting said bar with the rocking lever F' and transmitting its movement thereto, substantially as set forth.

4. In a striking apparatus of an automatic railway-signal, the combination of the frame E E' E'', a rocking shaft F, journaled in said frame and having the rocking lever F', with spring-pawls F'' *f''* and connecting-lever F''', a traversing bar K, having adjustable collars K' and slot *k*, adapted to engage the lever F''', and operated by a spring K'' and bell-

cord *i*, and the buffer-springs E''', substantially as set forth.

5. In a striking apparatus of an automatic railway-signal, the combination of the frame E E' E'', a rocking shaft F, having rocking lever F', with pawls F'', a ratchet-wheel G, journaled upon said rocking shaft and adapted to be turned in one direction by the pawls F'' and having pins *g*, pawls or detents G', pivoted to said frame E and gearing in said ratchet-wheel, a striker H, adapted to be operated by the pins *g* and a spring, and a spring H', drawing said striker in one direction, substantially as set forth.

In testimony whereof I have signed in the presence of the undersigned witnesses.

DANIEL GRANT.

Witnesses:

HENRY ARMSTRONG,
R. KENNEDY.