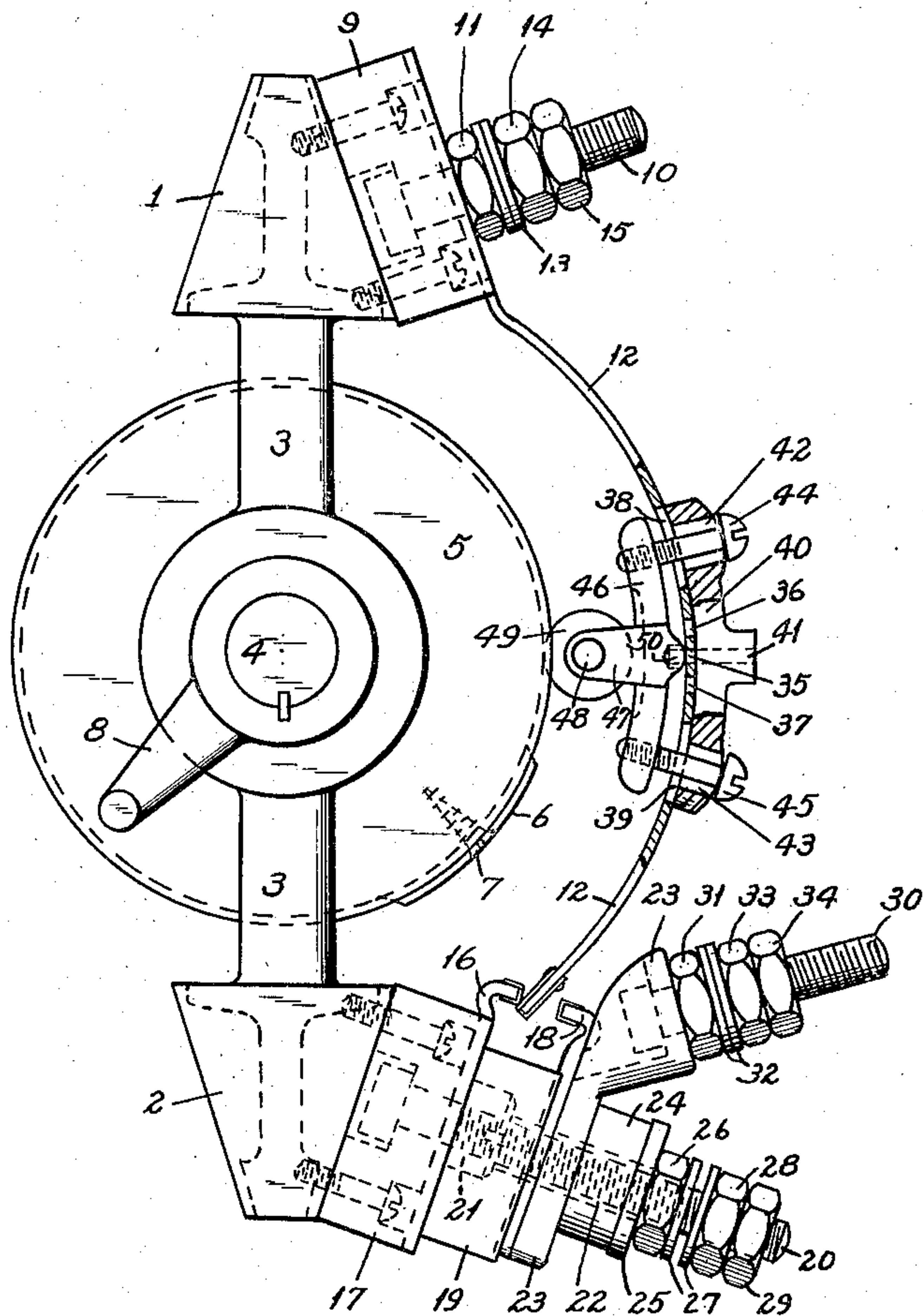


R. C. LEAKE.  
ELECTRIC CIRCUIT TIMING DEVICE.  
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1,155,322.

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INVENTOR  
*Richard C. Leake*  
BY  
*Lynman E. Dodge*  
ATTORNEY



# UNITED STATES PATENT OFFICE.

RICHARD C. LEAKE, OF ROCHESTER, NEW YORK, ASSIGNOR TO GENERAL RAILWAY SIGNAL COMPANY, OF GATES, NEW YORK, A CORPORATION OF NEW YORK.

## ELECTRIC-CIRCUIT-TIMING DEVICE.

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Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, RICHARD C. LEAKE, a citizen of the United States, and a resident of the city of Rochester, in the county of Monroe and State of New York, have invented a new and useful Electric-Circuit-Timing Device, of which the following is a specification.

This invention relates to a device adapted to accurately time the breaking and making of electric circuits, more especially those opened and closed by means of a drum carrying one or more peripheral segments actuating the contacts through the medium of the timing device.

The invention has for its main object the provision of a simple, efficient and durable circuit timing device capable of quick, convenient and accurate adjustment and of maintaining said adjustment when once made, and having all its parts readily accessible for inspection, readjustment or repairs.

Other objects and advantages will appear as the description of the invention progresses, and the novel features of the invention will be particularly pointed out in the appended claims.

Reference is made to the accompanying drawing forming part of this specification, and which is a vertical partly sectional view of the improved timing device as used for making and breaking two electric circuits, and with the segment carrying drum and the frame shown in end elevation.

Any suitable frame may be made with upper bar 1, lower bar 2, and opposite end bars or heads 3, connecting them. The end bars 3, have enlarged central parts in which are journaled a shaft 4, to which is fixed a drum 5 in one of the peripheral grooves of which is shown a short segmental camplate 6, fastened by a set screw 7. The shaft 4, may fixedly carry any approved device such as a crank arm 8, by which the shaft and drum may be turned together. To the top frame bar 1, is fastened by screws or otherwise an insulating block 9, within a face groove of which is fastened by a binding post 10, and a nut 11, the upper end of a contact finger 12. The post 10, also carries washers 13, and nuts 14, 15, for securing a circuit wire. In the illustrated arrangement the convexed resilient contact finger

12, normally engages a fixed contact 16, which is held in a face groove of an insulating block 17, fixed by screws or otherwise to the lower frame bar 2, and the finger also is adapted to leave contact 16, and engage an opposing contact 18, which enters a shallow groove in the outer face of another insulating block 19. A binding post 20, having a faceted head entering a like shaped recess in the insulating block 17, passes outwardly through the two blocks 17, 19, and the two contacts 16, 18, and the block 19, has an inner recess receiving a nut 21, which had been screwed upon the threads of binding post 20, to fasten the contact 16, to the block 17, before the block 19, was applied upon the inner block 17, over the contact 16. An insulating bushing 22, is slipped upon the post 20, outside the nut 21, and on this bushing are placed a conductive bracket 23, an insulating sleeve 24, and a washer 25, outside of which the post 20 has a nut 26, which fastens all parts 22, 25, 24, 23, 18 and 19, while holding block 19, securely to the outer face of block 17. Washers 27, and nuts 28, 29, provide for fastening a circuit wire to the binding post 20. The recessed head of bracket 23, receives the non-revoluble head of a binding post 30, having a fastening nut 31, clamping the bracket 23, and this post carries washers 32, and nuts 33, 34, providing for fastening a circuit wire. It is obvious that a wire held to binding post 20, will be in circuit only with the contact 16, and that a wire held to post 30, will be in circuit only with contact 18. The ends of the finger 12, and contacts 16, 18, preferably have coating platinum tips shown in the drawing.

The adjustable parts of the circuit timing device held to the contact finger 12, will now be described as follows. The finger is about one-half inch wide and one-sixteenth inch thick and about at its center has three quite closely grouped pin-receiving holes 35, 36, 37, and two slots 38, 39. A concaved clamp 40, closely overlies the finger 12, at said holes and slots and has a fixed pin 41, projecting inward and shown passing through the finger hole 35. Near its opposite ends the clamp has slots 42, 43, through which and the finger slots 38, 39, are passed headed adjusting screws 44, 45, respectively. These screws are threaded into holes made



in the opposite end parts of a concavo-convex bracket 46, having an inwardly projecting yoke 47, in which is fixed the axle 48, of an insulating roller 49, which normally enters that groove of the drum 5, in which the plate 6, is fastened. The central back part of the bracket 46, is bulged outward to give a rocking bearing of the bracket on the inner face of the contact finger 12, next any one of the finger holes 35, 36, 37, through which the clamp pin 41, passes to enter a recess 50, made in said bulged rear part of the bracket and thus determine the general operative position of both the clamp 40, and bracket 46, on the contact finger 12.

The operation is as follows: When the clamp pin 41, snugly rests in the central finger hole 35, as shown in the drawing, the centers of this pin and of the roller axle 48, and of the drum shaft 4, range horizontally on a line about at right angles with a vertical line which would pass through the center of the drum shaft. It is obvious that if the bracket 46, be rocked on its center bearing on the finger 12, the roller 49, will be correspondingly raised or lowered so as to stand farther from or nearer to the drum plate 6, to correspondingly delay or hasten the contact of plate 6, with the bracket roller 49, as the drum is turned counter-clockwise from the position shown in the drawing. As the plate 6, strikes the roller 49, and rides under it, the roller is pushed outward thereby moving the finger 12 from the fixed contact 16, and engaging the finger with the opposed contact 18, thereby breaking one circuit through the binding post 20, and closing another circuit through the binding post 30. It is obvious, that either contact 16, or 18, may alone be used for making and breaking but one corresponding circuit. The screws 44, 45, constitute one means for imparting the above named rocking movement to the roller carrying bracket and securely locking the bracket at the desired adjustment. If the screw 44, be turned clockwise and the screw 45 be turned counter-clockwise the bracket 46, will be rocked to raise the roller 49, and thus delay action of drum plate 6, upon it, and a reverse turning of the screws will lower the roller to hasten action of plate 6 upon it. As the like threads of the two screws 44, 45, may be quite fine, the roller may be very nicely and conveniently adjusted for accurately timing the action of the drum cam-plate 6, upon it for precisely controlling one or more circuits to be made or broken by the contact finger 12. If at any time a greater range of vertical adjustment of the roller be desired, the screws 44, 45, may be turned back in or entirely free from the bracket 46, to allow the clamp pin 41, to be adjusted in the uppermost finger hole 36, thus bodily raising the clamp and bracket and roller to assure longer delay of

action of the drum plate 6, on the roller 49, and an adjustment of the clamp pin 41, in the lowermost finger hole 37, will correspondingly hasten engagement of the drum plate 6, with the roller. The slots 38, 39, in contact finger 12, accommodate the adjusting screws 44, 45, and permit their free rotation when the clamp pin 41, passes through any one of the three finger holes 35, 36, 37. When the timing device pin 41, is in either finger hole 36, 37, the same nicety of vertical adjustment of the rocking bracket roller 49, is possible as when the pin is in the center finger hole 35. It will be seen that all parts of this improved timing device are at all times fully open to inspection and are easily accessible for adjustment without disturbing either or both relatively fixed contacts 16, 18, or the binding post and line wire connections to said posts.

Although I have particularly described the construction of one physical embodiment of my invention, and explained the operation and principle thereof; nevertheless, I desire to have it understood that the form selected is merely illustrative, but does not exhaust the possible physical embodiments of the idea of means underlying my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. An electric circuit timing device comprising a contact finger, a rocking part held thereto, means adjusting the rocking part relatively to the finger, and a cam adapted to simultaneously move said mutually adjusted rocking part and finger for controlling one or more electric circuits through the finger at different times predetermined by relative adjustment of the rocking part and finger.

2. An electric circuit timing device comprising a contact finger, a rocking part held thereto, means adjusting the rocking part relatively to the finger, a drum, and a cam on the drum adapted to simultaneously move said mutually adjusted rocking part and finger for controlling one or more electric circuits through the finger at different times predetermined by relative adjustment of the rocking part and finger.

3. An electric circuit timing device comprising a contact finger, a rocking part fulcrumed thereat, means adjusting the rocking part relatively to the finger, and a cam adapted to simultaneously move said mutually adjusted rocking part and finger for controlling one or more electric circuits through the finger at different times predetermined by relative adjustment of the rocking part and finger.

4. An electric circuit timing device comprising a contact finger, a rocking part fulcrumed thereat, two screws adjusting and locking the bracket relatively to the finger,



and a cam adapted to simultaneously move said mutually adjusted rocking part and finger for controlling one or more electric circuits through the finger at different times predetermined by relative adjustment of the rocking part and finger.

5. An electric circuit timing device comprising a contact finger, a rocking part held thereto, an insulating roller journaled to said rocking part, means adjusting said rocking part and roller relatively to the finger, and a cam adapted by action on the roller to move said mutually adjusted rocking part and finger for controlling one or more electric circuits through the finger at different times predetermined by relative adjustment of the rocking part and finger.

6. An electric circuit timing device comprising a contact finger, a rocking part held thereto, an insulating roller journaled to said rocking part, means adjusting said rocking part and roller relatively to the finger, a drum, and a cam on the drum adapted by action on the roller to move said mutually adjusted rocking part and finger for controlling one or more electric circuits through the finger at different times predetermined by relative adjustment of the rocking part and finger.

7. An electric circuit timing device comprising a contact finger, a rocking part fulcrumed thereat and carrying an insulating part, means adjusting the bracket relatively to the finger, and a cam adapted to simultaneously move said mutually adjusted bracket and finger by pressure on the bracket insulating part for controlling electric circuits through the finger.

8. An electric circuit timing device comprising a contact finger, a rocking part fulcrumed thereat and carrying an insulating part, two screws adjusting and locking the bracket relatively to the finger, and a cam adapted to simultaneously move said mutually adjusted bracket and finger by pressure on the bracket insulating part for controlling electric circuits through the finger.

9. An electric circuit timing device comprising a contact finger, a rocking bracket fulcrumed thereat, means whereby the fulcrum of said bracket may be changed to differing points along the finger, means adjusting the bracket relatively to the finger, and a cam adapted to simultaneously move said mutually adjusted bracket and finger by pressure at the bracket for controlling electric circuits through the finger.

10. An electric circuit timing device comprising a contact finger, a rocking bracket fulcrumed thereat, means whereby the ful-

crum of said bracket may be changed to differing points along the finger, two screws adjusting and locking the bracket relatively to the finger, and a cam adapted to simultaneously move said mutually adjusted bracket and finger by pressure at the bracket for controlling electric circuits through the finger.

11. An electric circuit timing device comprising a contact finger, a clamp thereon having a fixed pin, a bracket having a rocking engagement with the finger and said pin, and means adjusting the bracket on its fulcrum and correspondingly timing the engagement of the bracket by an operating part for controlling electric circuits through the finger.

12. An electric circuit timing device comprising a contact finger, a clamp thereon having a fixed pin, a bracket having a rocking engagement with the contact finger and said pin and two screws adjusting and locking the bracket relatively to the finger and correspondingly timing the engagement of the bracket by an operating part for controlling electric circuits through the finger.

13. An electric circuit timing device comprising a contact finger, a clamp thereon having a fixed pin, a bracket having a rocking engagement with the contact finger and said pin, and means adjusting the bracket on its fulcrum and correspondingly timing the engagement of the bracket by an operating part for controlling electric circuits through the finger, said finger having a plurality of holes through any one of which the clamp pin may pass, whereby the fulcrum of the rocking bracket may be changed for varying the normal position of the bracket relatively to said operating part.

14. An electric circuit timing device comprising a contact finger, a clamp thereon having a fixed pin, a bracket having a rocking engagement with the contact finger and said pin, and two screws adjusting and locking the bracket relatively to the finger and correspondingly timing the engagement of the bracket by an operating part for controlling electric circuits through the finger, said finger having a plurality of holes through any one of which the clamp pin may pass whereby the fulcrum of the rocking bracket may be changed for varying the normal position of the bracket relatively to said operating part, said finger also having two slots through which pass the bracket adjusting screws at all fulcrum-adjusted positions of the bracket.

RICHARD C. LEAKE.