

(No Model.)

2 Sheets—Sheet 1.

W. E. SINCLAIR.  
ELECTRIC DISTRIBUTION MACHINE.

No. 566,874.

Patented Sept. 1, 1896.

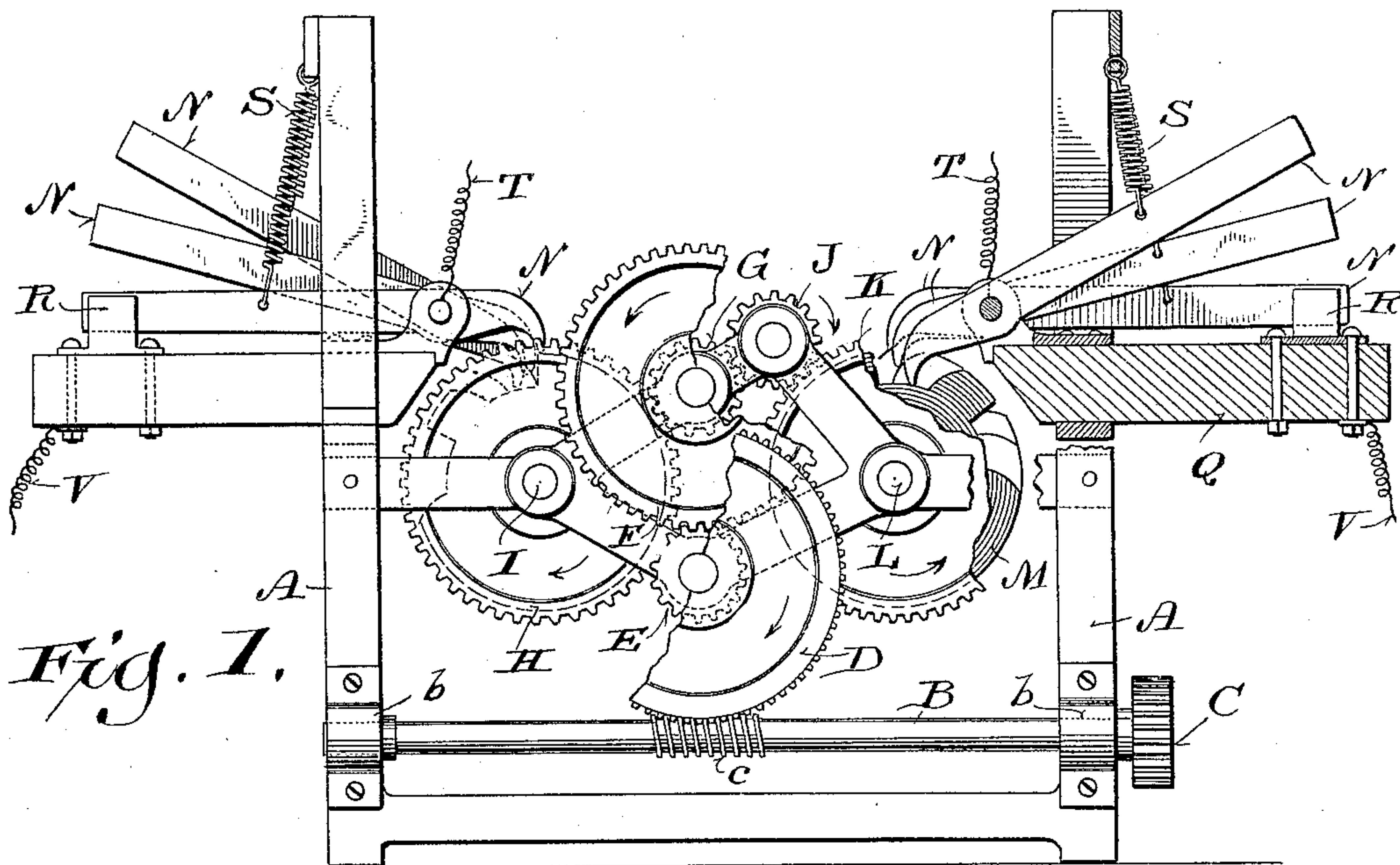
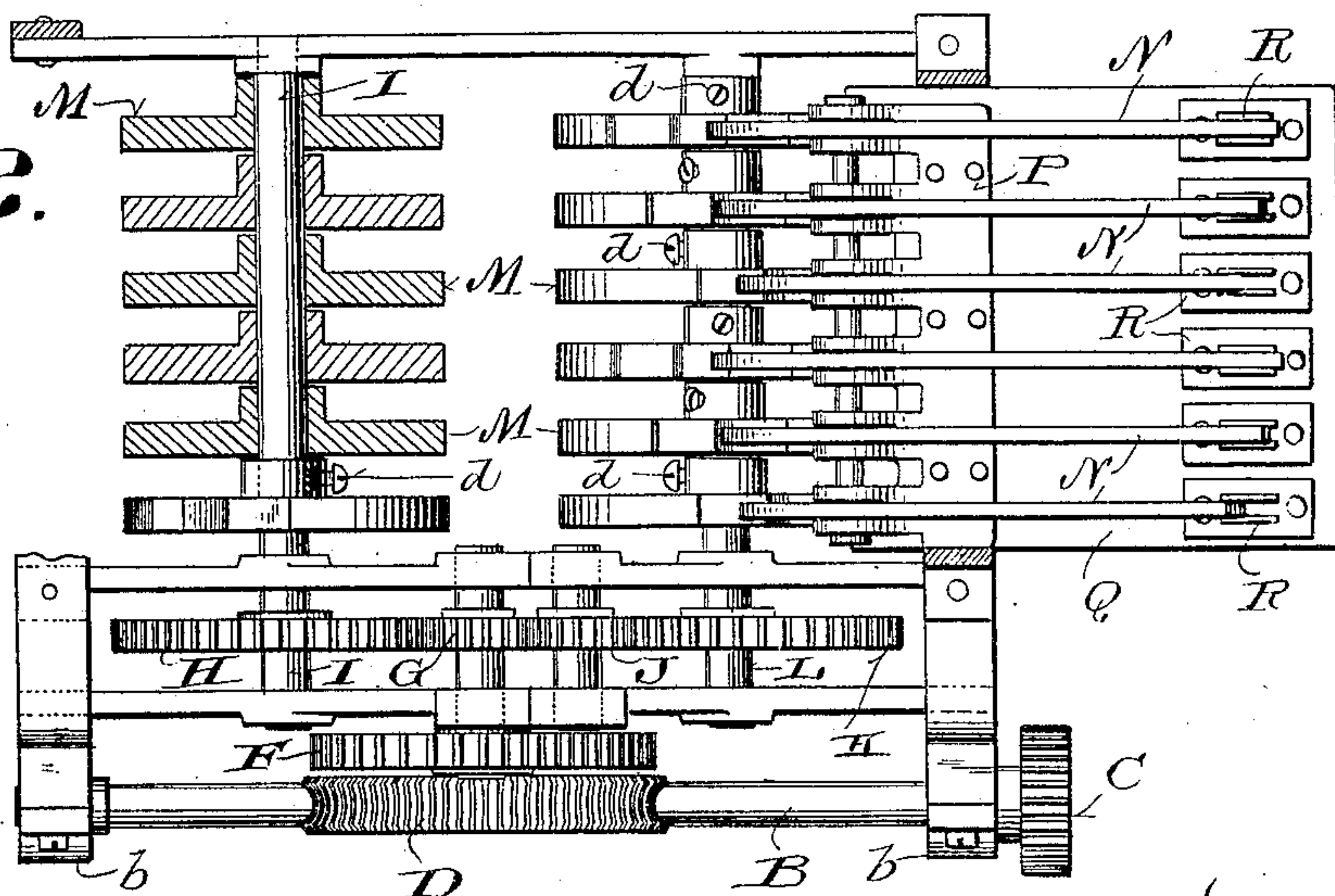


Fig. 2.



Witnesses:  
Geo. W. Young,  
H. E. Oliphant

Inventor:  
William E. Sinclair  
By H. G. Underwood  
Attorney

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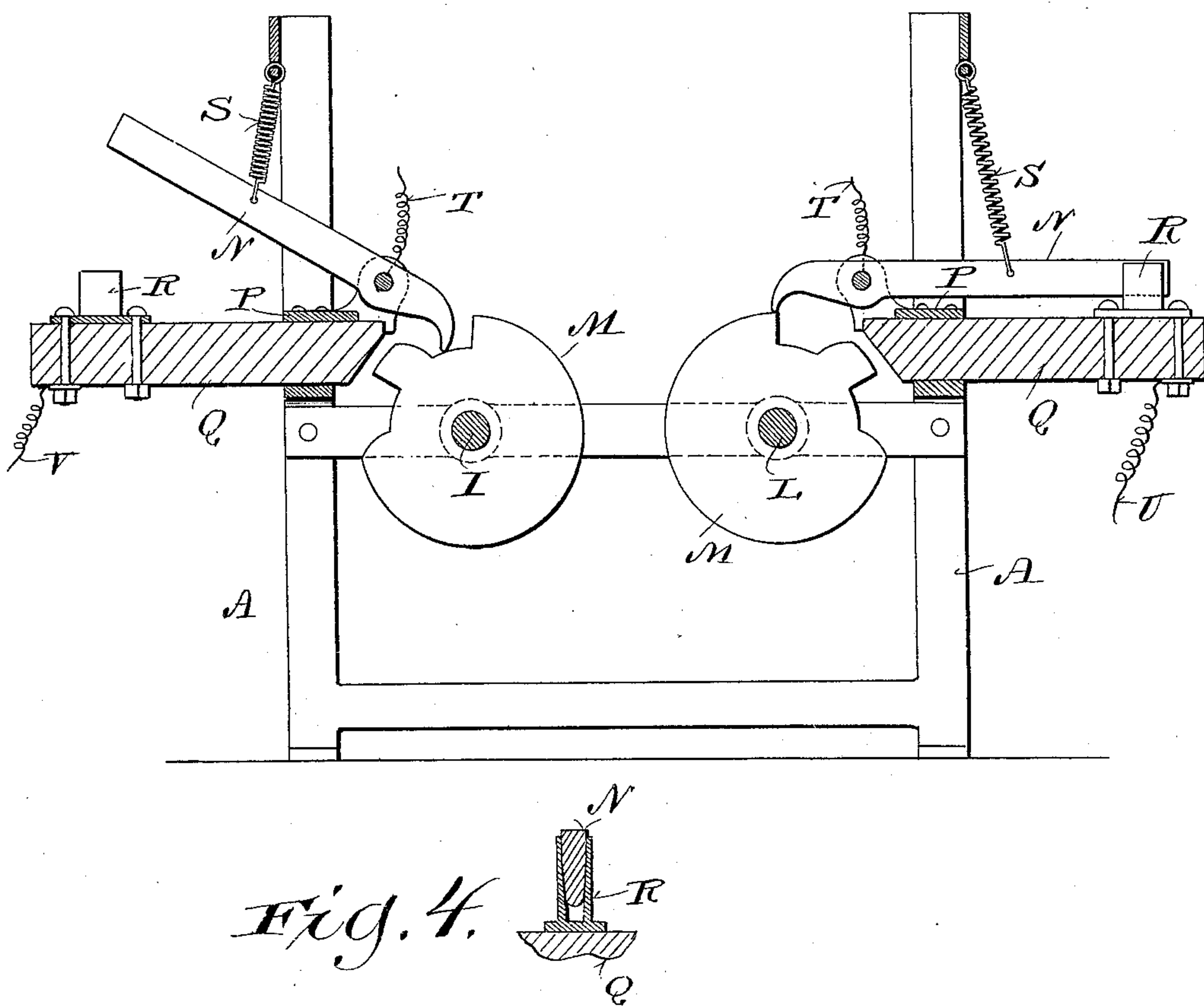
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*Fig. 3.*



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Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM E. SINCLAIR, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO WILLIAM GOLTZ, OF SAME PLACE.

## ELECTRIC-DISTRIBUTION MACHINE.

SPECIFICATION forming part of Letters Patent No. 566,874, dated September 1, 1896.

Application filed July 25, 1895. Serial No. 557,070. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. SINCLAIR, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Electric-Distribution Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple, economical, effective, compact, easy-running, and durable distribution-machine for electrical use to cause automatic alternate energizing and deenergizing of electric circuits at predetermined intervals. The machine is especially applicable in connection with display-lighting by electricity; and the invention consists in certain peculiarities of construction and combination of parts hereinafter set forth with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents an elevation of my machine partly broken away and in section; Fig. 2, a plan view of the same, also partly broken away and in section; Fig. 3, a vertical longitudinal section of the machine, and Fig. 4 a detail transverse section of a knife-switch.

Referring by letter to the drawings I show a frame of any suitable construction having vertical portions A thereof provided with bearings b for a horizontal worm-shaft B, and fast on this shaft is a pinion C for gear connection with an electric or other suitable motor. In mesh with the worm c of the shaft B is a worm-wheel D, fast on a shaft that rotates in the machine-frame and carries a pinion E, constituting part of a gear-train, that also embodies a spur-wheel F in mesh with pinion E, another pinion G on the spur-wheel shaft, and another spur-wheel H in mesh with the latter pinion, this spur-wheel H being fast on a shaft I, that has its bearings in said machine-frame. The gear-train may also comprise a pinion J in mesh with the one G and a spur-wheel K on another shaft L, hung in the machine-frame parallel to the one I above specified, the rotation of said shafts being in opposite directions, as indicated by arrows on the spur-wheels H K in Fig. 1. On each of the shafts I L, I show a series of rotarily-adjust-

able cams M, held in place by means of set-screws d in their hubs; but so far as my invention is concerned the cams may be otherwise than rotarily adjustable and the contour of each cam may be indefinitely varied. It is also within the scope of my invention to indefinitely multiply the cams on either shaft, and it is to be understood that the two series of cams are only employed in order to compact the machine or to adapt the same to a three-wire system of electrical distribution in order to balance the currents. Each cam M operates in conjunction with a quick-break knife-switch, the blade N of which is pivoted to vertical ears of a conductor-plate P, fast on a horizontal table Q of insulating material, supported by the machine-frame, and the contact-groove R for said blade is also fast on the table. The pull-out spring S for each switch-blade is joined to the machine-frame, a feed-wire T is in electrical connection through the conductor-plate with all the switch-blades in a series, and a distributor-wire U is in like connection with each contact-groove.

The gear-train above specified is employed to reduce speed of the cam-shafts in proportion to the speed of the motor employed to drive the machine, the motor commonly employed being of the high-speed electrical variety.

In practice each distributor-wire is in circuit with any suitable number of electric devices, and incidental to the action of one of the cams a corresponding knife-switch is operated to alternately open and close the circuit at predetermined intervals, the frequency and duration of current being due to the contour of said cam. The inner end of each switch-blade being operated upon by the rise or rises of a cam, said blade is tilted on its pivot against resistance of the pull-out spring and thereby brought into engagement with a corresponding contact-groove, whereby an automatic distribution of current takes place. It also follows that the drop or drops in said cam will permit the pull-out spring to retract and thereby bring the switch-blade out of the contact-groove to shut off current, the latter operation being quickly performed. It will be observed that the groove-engaging portion of each switch-blade is at a consider-



ably greater distance from the pivot connection with the conductor-plate than the cam-opposing portion, and therefore a cam-rise will pass away from the latter portion of said blade before the former portion can clear the contact-groove. Consequently the electric arc must always take place between the aforesaid blade and groove, and this arc is quickly broken by the contraction of the pull-out spring. Hence it will be seen that I prevent damage to the sharp-angle corners of the rotative switch-closer.

Assuming that my machine is employed in connection with electric lighting, the number of the cams, their contours, and adjustment, together with the number, arrangement, and colors of lamps in circuit with each switch, determine the display of light, and this display may be indefinitely varied, while at the same time the machine requires a comparatively small expenditure of power and does not occupy any considerable area of space. It is also to be understood that rotation of the cam-shafts must be comparatively slow in order to obtain sufficient duration of the light in various designs formed by electric lamps in circuit with the various switches. Hence the employment of the speed-reducing gear above specified.

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

1. An electric-distribution machine comprising a series of automatic quick-break knife-switches, each of which is for incorpo-

ration as part of an electric circuit, a power-shaft, a counter-shaft in gear with the power-shaft, and a series of rotarily-adjustable switch-closing cams carried by the counter-shaft.

2. An electric-distribution machine comprising an automatic quick-break knife-switch for incorporation as part of an electric circuit, a power-shaft, a counter-shaft, a switch-closing cam on the counter-shaft, and a reducing-gear in train with the shafts.

3. An electric-distribution machine comprising a series of automatic quick-break knife-switches, each of the same being for incorporation as part of an electric circuit, a power-shaft, a counter-shaft, a series of switch-closing cams on the counter-shaft, and a reducing-gear in train with the shafts.

4. An electric-distribution machine comprising a series of automatic quick-break knife-switches, each of the same being for incorporation as part of an electric circuit, a power-shaft, a counter-shaft, a series of switch-closing cams rotarily adjustable on the counter-shaft, and a reducing-gear in train with the shafts.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WILLIAM E. SINCLAIR.

Witnesses:

N. E. OLIPHANT,  
HENRY DANKERT.