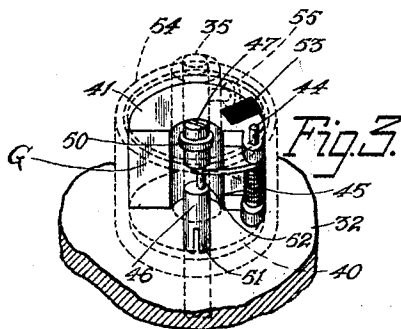
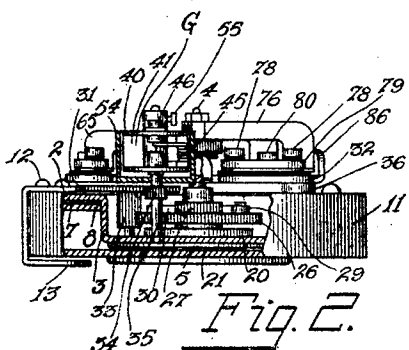
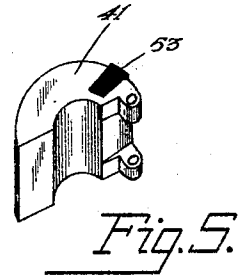
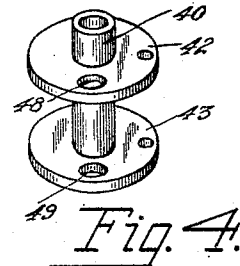
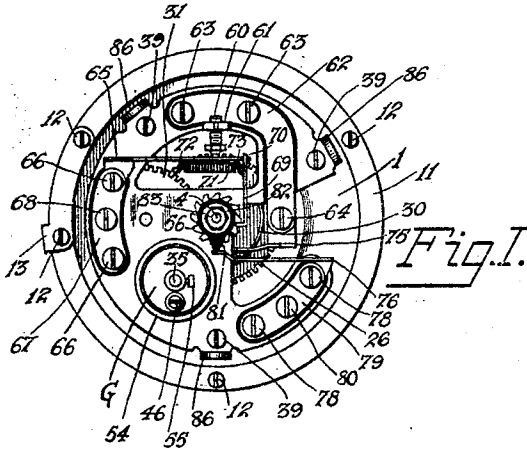


W. KAISLING.
CALLING DEVICE.

APPLICATION FILED JULY 13, 1916.

1,304,062.

Patented May 20, 1919.



Inventor:
William Kaisling
By Antisclaw
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM KAISLING, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CALLING DEVICE.

1,304,062.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM KAISLING, a citizen of the United States of America, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Calling Devices, of which the following is a specification.

My invention relates to calling devices, and has to do more particularly with calling devices such as are commonly used at telephone substations for controlling the automatic switches which are located at the central office by directive impulses to extend the connection from a calling substation to a called substation through the agency of the said switches. My invention is preferably adapted to operate in conjunction with the so-called metallic or two-wire type automatic circuits in which the circuit of the line is interrupted a number of times determined by the adjustment of the calling device. This application is a divisional application of my application for calling devices filed June 23, 1915, Serial Number 35,752.

One of the features of my invention is the provision of an improved governing device and the novel method in which the governor device is connected with the power driving mechanism of the calling device.

It has been found from practice that a calling device of simple construction and one that does not readily get out of order is most desirable, and to this end I further direct my invention by producing an improved device of the class described which will obviate the objectionable features heretofore found in calling devices and embody desirable features and advantages all in a simple, efficient and economical manner, and to the accomplishment of this object and such others as may hereinafter appear the invention consists in the novel details of construction, parts and combination of parts hereinafter described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings in which I illustrate the calling device in the different views, and in which views like reference characters indicate like parts, and in which—

Figure 1 is a rear view of the calling device; Fig. 2 is a bottom view of Fig. 1 with certain parts cut away; Fig. 3 is a skeleton

perspective view of the governor mechanism; Fig. 4 is a perspective view of the spool-shaped member which holds the parts of the governor; and Fig. 5 is a perspective view of the weighted member of the governor.

Referring now more in detail to my invention as illustrated, it comprises a main mounting plate 1, having a flanged portion 2 and a forwardly extending cup-shaped portion 3. A main shaft 4 extends concentrically through the bearing of the main mounting plate 1, and has a finger-hold actuating member 5 fastened to it in any suitable manner, it being preferably staked at its forward end to the said shaft 4. The finger-hold actuating member 5 is provided with a plurality of openings or finger-holds, preferably 10 in number. The number indicating disk 7 is placed with its indicating numerals below the actuating member 5 and rests upon the flange 2, the said numerals corresponding with the finger-holds. The indicating disk 7 has a protective disk 8 of transparent material such as glass placed in front of it so as to protect the said indicating disk.

The ten openings which form the finger-holds are numbered 1, 2, 3, etc., to 0. The calling device is adapted to transmit from one to ten impulses, the said numerals upon the indicating disk indicating the number of impulses its corresponding hold is adapted to send through the agency of the impulse springs. I also provide a casing 11 for inclosing the forward portion of the device, the said casing being fastened to the flanged portion 2 of the mounting plate 1 by means of the screws 12.

A stationary finger stop 13 is mounted upon the flanged portion of the casing 11 by means of the screws 12. When the actuating member 5 is advanced in a clock-wise direction the advancing finger of the operator engages the stop 13 and arrests the movement of the actuating member 5.

Referring now more particularly to the operating mechanism, the main shaft 4 extends through a spring barrel 20, which incloses a motor spring 21. The actuating member 5 which is staked to the shaft 4, fits closely against the barrel 20 forming a cover for the same.

Positioned next to the spring barrel 20

along the shaft 4 is the gear wheel 26 loosely mounted upon the said shaft. A ratchet wheel 27 is positioned next to the gear wheel 26, the said ratchet 27 being rigidly fastened to the shaft 4 in any suitable manner. The ratchet wheel 27 resists against the face of the gear 26 and a pawl 29 pivotally fastened to the gear wheel 26 is operatively associated with the ratchet wheel 27, the said pawl being held against the said ratchet by means of a spring 30 which is also positioned upon the gear wheel 26, and held in place in any suitable manner. A gear wheel 31 is rotatably secured at its opposite ends to the plate 1 and to a bridge plate 32, the said bridge plate being secured to the studs 36, by means of the screws 39. The said studs are staked to the plate 1 thus securely holding the plate 32 upon the main mounting plate 1. The gear 31 has a pinion 33 staked to it in any suitable manner, and this pinion 33 meshes with the gear 26. The gear wheel 31 meshes with a pinion 34 which is integral with the shaft 35 of the governor mechanism G, which is adapted to retard the return movement of the finger hold actuating member 5 to a predetermined speed.

The governor mechanism G comprises a main shaft 35 which is rotatably supported at its opposite ends in the plate 1 and the bridge plate 32. A pinion 34 is cut upon the shaft 35 and is shown in mesh with the gear 31. A spool-shaped member 40 holds the governor mechanism which controls the speed of the calling device in its return movement. The governor comprises a weighted member 41, semi-circular in shape, being pivotally mounted between the two spool heads 42 and 43 by means of a pivoted pin 44. A coiled spring 45 is positioned upon the pin 44, one of its free ends bearing against the weighted member 41, and the other free end of the spring bearing against an adjustment pin 46. This adjustment pin 46 in conjunction with the spring 45 regulates the speed at which the governor may be driven and therefore, of course, the speed at which the calling device transmits the impulses. The adjustment pin 46 has a slotted head 47 so that the pin may be turned and is inserted into the openings 48 and 49 of the spool heads of the member 40. The pin 46 also has a shoulder 50 which forms a bearing surface while the pin is being adjusted to regulate the speed of the governor. The end 51 of the pin 46 is slotted and spread so that when the pin is in place and in a certain adjustment, it will stay so adjusted due to the frictional engagement with the opening 49. A portion of the body of the pin is eccentrically disposed, forming the eccentric portion 52 and one end of the spring 45 rests upon this part of the pin. A piece of fiber 53, or other suitable material, is securely held in the weighted member 41 in close prox-

imity to the fulcrum of the weight. The member 40 and the several parts above described as a whole is slipped over the shaft 35 and into a cup-shaped member 54, which is rigidly secured to the bridge plate 32 in any suitable manner and forms a containing member for the said governor mechanism G. The member 40 is held in position with its several parts upon the shaft 35 by means of the set screw 55.

The governor mechanism G is operatively associated with the train of gearing comprising the gears 26 and 31, and pinions 33 and 34. Now when the member 5 is operated in a clock-wise direction to set the calling device to transmit a certain number of impulses, the gear 26 being loosely mounted upon the shaft permits the movement of the shaft and ratchet also in a clock-wise direction so that the pawl 29 rides over the teeth of the ratchet wheel 27. Upon the return movement of the member 5 with the shaft 4 and ratchet 27, the pawl 29 being fastened to the gear 26, engages one of the teeth of ratchet wheel 27, causing the gear to be carried with it, and this return motion is transmitted by the train of gearing to the governor mechanism G. The weighted member 41 being pivotally mounted by the pivot pin 44 in the spool member 40 which is being rotated due to being fastened to the shaft 35, causes the member 41 to be forced out by centrifugal force against the tension of the spring 45. The piece of fiber 53 upon the member 41 is forced against the inside periphery of the cup 54, and as the said fiber 53 is held in close proximity to the fulcrum of the weighted member 41, the weight of the member 41 is multiplied in assisting the fiber 53 to remain in frictional engagement with the inside periphery of the cup 54 against the tension of the spring 45, thus permitting the device in its return movement to restore at a predetermined speed. In practice, it has been found that a group of impulses, ten in number, may be sent in a space from three-fourths to one and one-half seconds of time, and to permit the calling device to operate within these limits, I provide adjustable means for the governor in the form previously described. Now should it be desired that the device run at a speed so as to transmit ten impulses in say one and one-half seconds, the adjustable pin is turned until the eccentric 52 is at its lowest point so that the end of the spring 45 rests upon this lowest point of the eccentric and in this position the spring 45 is under the least tension so that upon the return movement of the device the weighted member 41 is more easily acted upon by centrifugal force causing the fiber to be held firmly in frictional engagement against the inside of the periphery of the cup 54. Now when the device is to be speeded up, the ad-

justing screw may be turned causing the spring end of the spring 45 to ride upon the eccentric until the eccentric is at its highest point, and in this position of the eccentric causes the tension of the spring 45 to be increased. The resultant force acting upon the member 41 is decreased due to the increased tension of the spring 45, so that the frictional engagement of the fiber 53 and the inside periphery of the cup 54 is not as great as in the former case, thus permitting the speed of the return movement to be increased and also permit a much shorter period for each impulse.

In order to operate the impulse springs of the device, I preferably provide an actuating ratchet 56 insulatingly mounted upon the main shaft 4 and having a plurality of teeth, 12 in number.

Impulse contacts are provided which are interrupted according to the number of impulses to be transmitted, therefore I provide a pair of normally closed contacts. One of the contacts is in the form of an adjustable contact screw 60, which has screw-threaded engagement with a lug 61 which is integral with the L-shaped member 62, this member 62 being insulatingly mounted upon the plate 32 and held in place by the insulated screws 63. A screw 64 having screw-threaded engagement with the L-shaped member 62 forms a terminal for the adjustable contact 60. The other contact of the impulse springs is in the form of a spring 65 which is insulatingly mounted upon the bridge-plate 32 by means of the insulated screws 66 and the clamping plate 67. A screw 68 has screw-threaded engagement with the plate 67 and forms a terminal of the contact 65. I so arrange the impulse contacts that the duration of interruption and contact of the impulse contacts 60, 65, may be varied and to this end I provide the adjustable contact 60 which may be moved inwardly or outwardly in the lug 61. When the contact screw is turned so as to move the contact away from a spring 65 the duration of interruption will be increased and when moved toward the spring the duration of the interruption will be decreased. A pawl 69 and the spring 65 are operatively associated with each other and are connected so as to form a hinged point 70. A spiral spring 71 holds the pawl and spring in hinged relation, the said spring 71 having one end fastened to a hook 72 which is preferably integral with the spring 65; the other end of the spring 71 is fastened to a hook 73, which is integral with the pawl 69. The spring 71 holding the pawl 69 against the teeth of the ratchet 56 which is insulatingly mounted upon the shaft 4. Now if the actuating member 5 is rotated in a clock-wise direction, the pawl 69 rides over the teeth of the ratchet 56, but on the return movement, the nose of the

pawl engages a tooth of the ratchet and the spring 65 is drawn forward against its normal tension, thus opening the normal contacts 60, 65, and due to the restoring power of the motor spring 21, the nose of the pawl 69 is forced upon the tooth of the ratchet it was engaging against the tension of the spring 71, and when the nose of the pawl passes the teeth last engaged, due to the return movement of the shaft 4, the spring 71 draws the pawl into the next toothed depression of the ratchet to again close the contacts, the said contacts opening and closing according to the number of impulses that are being sent.

I also provide a pair of shunt springs 75 and 76 by which the subscribers' apparatus may be short-circuited while the impulses are being transmitted. The shunt spring 75 is insulatingly mounted upon the plate 32 by means of the insulated screws 63 and the clamping plate 62, the screw 64 forming the terminal for the shunt spring 75. The shunt spring 76 is insulatingly mounted upon the bridge plate 32 by means of the insulated screws 78 and the clamping plate 79, the screw 80 having screw-threaded engagement with the plate 78 forming a terminal for the spring 76. An operating stud 81 of insulating material is provided to operate the shunt springs and is positioned upon the shaft 4 next to the ratchet 56, the said stud 81 and the ratchet 56 being held in a position upon one end of the shaft 4, by means of a washer 82, and a nut 83, the said nut 83 having a screw-threaded engagement with the end of the shaft 4. The stud 81 is normally in engagement with the projecting portion of the shunt spring 76 whereby the said shunt spring contacts are held normally out of engagement, but when the shaft 4 and actuating member 5 are moved off normal, the stud 81 moving with the shaft 4 disengages the end of the spring 76 allowing the contacts 75, 76 to engage, the contacts remaining in engagement until the member 81 returns to normal. The lugs 86 upon the bridge plate 32 are provided to form means for fastening the dial to an instrument.

I will now describe briefly the operation of the device. Let us assume that the operator wishes to effect four operations of the impulse contacts 60, 65, that is to transmit four impulses, the finger of the operator will be inserted into the finger-hold above the number 4 (not illustrated but understood) and the member 5 is rotated in a clock-wise direction until the finger of the operator engages the stationary stop 13. The rotation of the member 5 also causes the rotation of the main shaft 4 and also the ratchet 27 and as the driving gear 26 is loose upon the shaft 4 and as pawl 29 is mounted upon the gear 26, the ratchet in its rotation allows the said pawl to pass over the teeth of the ratchet.

The pawl 69 which is operatively associated with the impulse spring 65 also passes over the teeth of the impulse ratchet 56 but not affecting the impulse springs at this time.

5 As the main shaft 4 leaves normal the stud 81 carried thereby disengages the projection of the shunt spring 76 allowing the said spring to engage the shunt spring 75 to close the said springs to short circuit the substation apparatus. The adjustment of member 10 5 also winds up the motor spring 21 so that when the finger of the operator is removed from the finger-hold of member 5, spring 21 restores shaft 4 and ratchet 27. The pawl 15 29 now engages a tooth in said ratchet and said ratchet carries the gear 26 with it and this motion is transmitted to the governor mechanism G through the agency of the train of gearing, thus allowing the restoration of the device at a predetermined speed. 20 Upon the return movement of the shaft, the ratchet 56 affects the pawl 69 as previously described to cause the contacts 60, 65 to be interrupted four times to transmit the 25 proper number of impulses. Upon this return to normal of the device the stud 81 again engages the projection of spring 76 again interrupting shunt springs 75, 76. The device is now at normal and is again 30 ready to be adjusted to effect the transmission of another set of impulses. For a more complete understanding of the calling device shown in this application, reference may be had to parent application, Serial Number 35 35,752, filed June 23, 1915.

In illustrating my invention, I have shown it operating with a certain form of substation, but I do not wish to be limited to this as the device of my invention is adapted for 40 other uses. I also do not wish to be limited to the exact structure as shown as many modifications and changes may readily suggest themselves, but I aim to cover all such changes as come within the spirit and scope 45 of the appended claims.

Having described my invention, what I claim as new and desire to secure by United States Letters Patent, is:

1. A governing device including a circular cup-shaped member, a spool positioned within said member carrying a semi-circular weighted member pivotally attached to the upper and lower plates of said spool, a coiled spring for holding said weighted member in its normal position, an engaging member for said weighted member secured near the fulcrumed extremity of said weighted member and extending out from the peripheral surface thereof, and driving means for rotating said spool whereby said engaging member frictionally contacts the inner peripheral surface of said circular cup-shaped member.

2. A governing device of the character described comprising a cylindrical casing, a

spool-shaped member adapted to fit within said casing, a weighted member pivotally secured to the said spool member and adapted to engage the inner surface of said cylindrical casing when the said spool member is revolved, a spring member for normally preventing such engagement, and a member provided with an eccentric pin for regulating the tension of said spring member upon said weighted member.

3. A device of the class described, including a cylindrical casing, a centrally positioned rotatable member within said casing, a weighted member secured at its one extremity to said rotatable member, a spring 80 for holding said weighted member in its normal position, a contact piece for said weighted member secured near the fulcrumed extremity of said weighted member and protruding out from the peripheral surface thereof, means for rotating said rotatable member whereby said contact piece engages the inner surface of said cylindrical casing, and means including a member provided with an eccentrically formed portion 90 for adjusting the tension of said spring.

4. A governing device for an impulse transmitter including a cylindrical casing, a rotatably secured member carrying a peripherally secured weighted member, a contact member attached to said weighted member for engaging the inner surface of said casing, a spring for yieldingly holding said weighted member out of engagement with said casing, a rotatable member provided 100 with an eccentrically formed portion for adjusting the tension of said spring, and a train of gearing for rotating said first member whereby said attached member frictionally engages the inner surface of said casing to govern the speed of rotation of said train of gearing.

5. A governing device for an impulse transmitter including a cylindrical casing, a rotatably secured member carrying a peripherally secured weighted member, a spring for yieldingly holding said weighted member normally out of engagement with said casing, a train of gearing for rotating said first member whereby said weighted member frictionally engages the inner surface of said casing to govern the speed of rotation of said train of gearing, and an adjustably mounted pin provided with an eccentric portion for regulating the tension of 120 said spring.

6. A governing device of the class described including a cylindrical cup, a rotatably secured spool mounted within said cup, a weighted member secured at its one end near the outer periphery of the plates of said spool, a coiled tensioning member for holding said weighted member in normal position, adjusting means for regulating the tension of said coiled tensioning member, and 130

a member carried by said weighted member adapted to engage the inner surface of said cup when said spool is rotated to govern the speed of rotation thereof.

5 7. A governing device including a suitable cylindrical shell, a spool provided with a pair of circular plates mounted within said shell, a semi-circular weighted member fulcrumed at its one end between said plates, 10 a coiled spring for normally holding said weighted member against the shaft of said spool, an engaging member for said weighted member secured near the fulcrumed extremity of said weighted member and extending out from the peripheral surface thereof, and driving means for rotating said spool whereby said engaging member frictionally contacts the inner peripheral surface of said shell and acts as a braking 15 means.

8. A governing device of the class described including a cylindrical casing, a hollow rotatable shaft provided with an attached upper and a lower circular plate, a 25 weighted member pivotally secured between said plates, a spring for holding said weighted member in its normal position, an adjustably mounted pin for regulating the tension of said spring, and a driving shaft extending through the hollow of said first shaft for rotating the same to cause said weighted member to frictionally engage the inner peripheral surface of said casing. 30

9. A governing device of the class described including a cylindrical casing, a hollow rotatable shaft provided with an attached upper and a lower circular plate, a weighted member pivotally secured between said plates, a surface engaging element attached to said weighted member, a spring 40 for holding said weighted member in its normal position, an adjustably mounted pin for regulating the tension of said spring, and a driving shaft extending through the hollow of said first shaft for rotating the 45

same to cause said engaging element to frictionally engage the inner peripheral surface of said casing.

10. A governing device of the class described including a cylindrical casing, a hollow rotatable shaft provided with attached upper and lower plates, a weighted member carried by said plates, and a driving shaft extending through the hollow of said first shaft for rotating the same to cause the 55 weighted member to frictionally engage the inner surface of said casing.

11. A governing device of the class described including a cylindrical casing, a rotatable member including an upper and a lower circular plate, a weighted member pivotally secured between said plates, a spring for holding said weighted member in its normal position, adjusting means for regulating the tension of said spring, and a driving 65 shaft connected to said rotatable member for rotating the same to cause said weighted member to frictionally engage the inner peripheral surface of said casing.

12. A governing device of the class described including a cylindrical casing, a rotatable member including an upper and a lower circular plate, a weighted member pivotally secured between said plates, a spring for holding said weighted member in its normal position, adjusting means for regulating the tension of said spring, a driving shaft connected to said rotatable member for rotating the same, and an engaging member carried by said weighted member for frictionally engaging the inner peripheral surface of said casing when said weighted member is rotated. 70 75 80

Signed by me at Chicago, county of Cook and State of Illinois, in the presence of two witnesses. 85

WILLIAM KAISLING.

Witnesses:

G. YENOWSKI,
WM. BERGHOLM.