

O. D. ZIEGLER:
SIGN FLASHER.

APPLICATION FILED OCT. 13, 1910.

992,468.

Patented May 16, 1911.

2 SHEETS—SHEET 1.

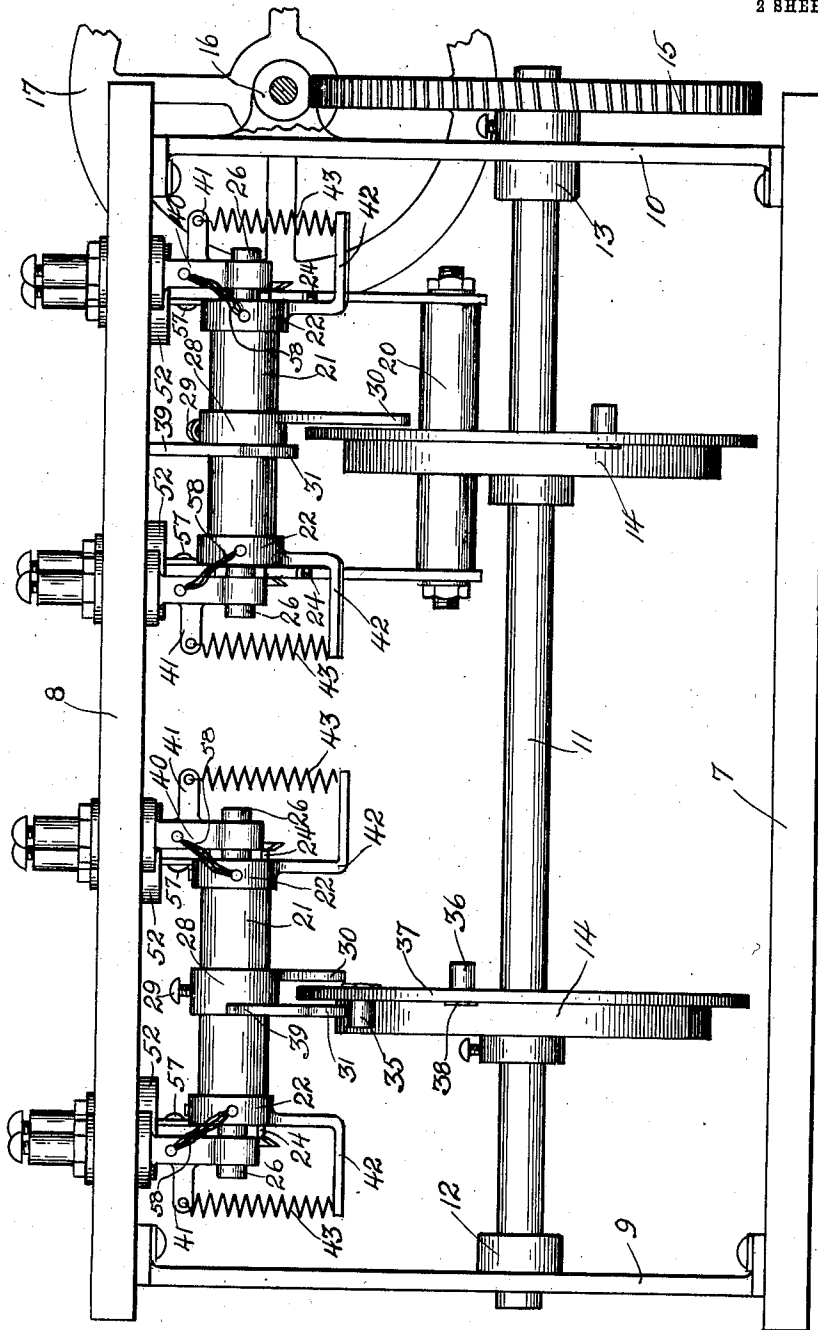


Fig. 1.

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2 SHEETS—SHEET 2.

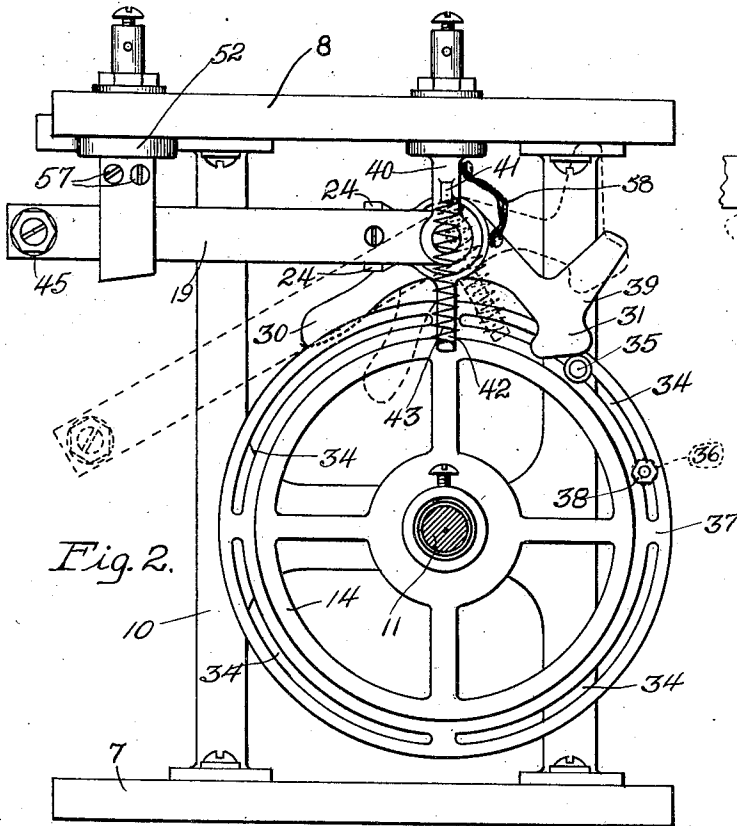


Fig. 2.

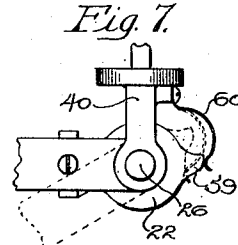


Fig. 7.

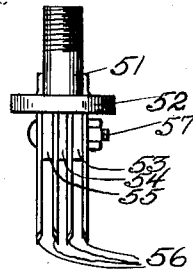


Fig. 5.

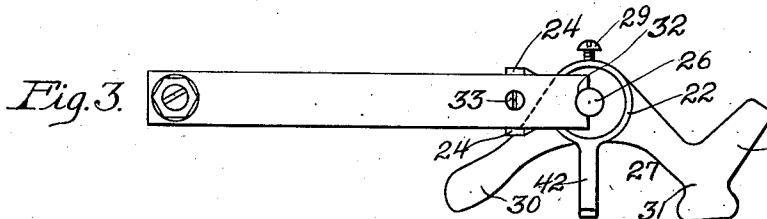


Fig. 3.

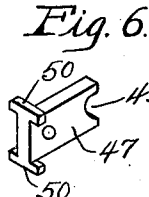


Fig. 6.

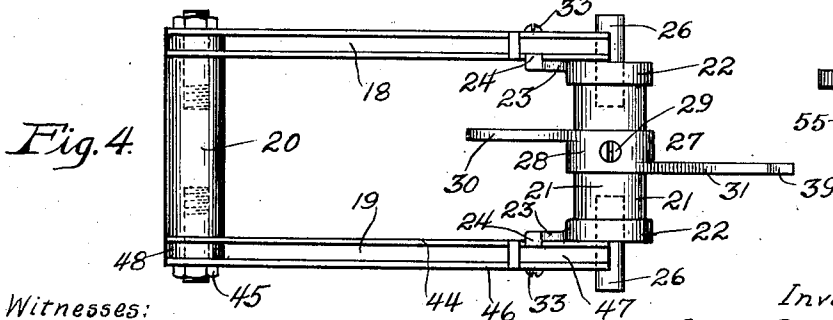


Fig. 4.

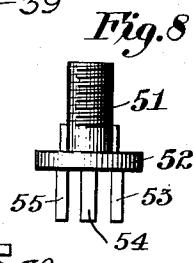


Fig. 8.

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SIGN-FLASHER.

992,468.

Specification of Letters Patent. Patented May 16, 1911.

Application filed October 13, 1910. Serial No. 586,897.

To all whom it may concern:

Be it known that I, OLIVER D. ZIEGLER, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Sign-Flashers, of which the following is a specification.

At the present time large flashing electric signs are being constructed in which large numbers of electric lamps must be lighted and extinguished simultaneously thus making it necessary to open and close electric circuits carrying high power many times an hour during the operation of the signs and under conditions and circumstances where it is impossible to give the best of attention to the flashing devices. In order to satisfactorily operate under such circumstances the flasher must be of very rigid and durable construction and be simply built and given such a small number of moving parts that it cannot become easily disarranged or injured in service.

In order to manufacture sign flashers cheaply in small quantities they must be so designed and built as to be largely interchangeable and standard parts must be used as much as possible. It is desirable to be able to assemble a flasher for the given conditions quickly and easily from parts carried in stock.

Objects of my invention are to provide a simple sign flasher intended particularly for handling large amounts of current: to provide a flasher of such design and arrangement that the same frame work may be used for supporting the moving parts for one circuit or for a number of circuits as the case may be: to provide a sign flasher switch of which the current carrying capacity may be easily and quickly increased or decreased in accordance with the requirements of the circuit which it is to handle: to provide mechanism for quickly opening and closing the circuits so as to reduce the burning of the blade contacts as much as possible: to make the movements of the switches positive thus insuring their more perfect action: to arrange the parts in such way that the various circuits may be properly insulated from each other while at the same time producing a strong mechanical construction: and in other ways and manners to generally improve the construction of electric sign flashers intended for heavy service.

Other objects and uses will appear from

a detailed description of the invention which consists in the features of construction and combination of parts hereinafter described and claimed.

Referring to the drawings: Figure 1 shows a front elevation of a flasher which includes two switches both operated from the same shaft, one of the switches being in closed position and the other one in open position; Fig. 2 shows a cross sectional view of my improved flasher showing the switch in closed position by means of full lines and in open position by dotted lines; Fig. 3 shows a side detail of my improved switch and lever mechanism; Fig. 4 is a plan view similar to Fig. 3, showing a gang switch having two blades on each pole; Fig. 5 is a detail view of the jaws for the gang switch of Fig. 4, showing how a number of jaws may be attached to the same base; Fig. 6 is a detail view of a spacer block for spacing the blades of the switch of Fig. 4; Fig. 7 shows a detail of a modified form of switch bearing; and Fig. 8 shows in detail the base block of one of my multiple contact switches.

In an embodiment of my invention I provide a frame-work carrying one circuit switch for each circuit and I provide means for opening and closing these switches in a predetermined manner according to the way the lamps of the various circuits are to be flashed. Each switch is preferably a knife switch of a quick break type. In general the operating mechanism comprises an operating wheel for each switch, said wheels carrying one or more pins. The corresponding switch is then provided with a form of escapement for engaging the pins so that as the wheel rotates the pins will engage the escapement mechanism one at a time first throwing the switch into closed position and then opening it. The preferred arrangement is one in which all of the circuit switches are placed side by side, the operating wheels being mounted on a common shaft properly located with respect to the switches to operate them and driven by any suitable mechanism.

Referring now to the drawings the general arrangement of parts is well shown in Fig. 1. As here illustrated the frame comprises a base 7 and a switch block 8 carried above the base and supported on a pair of standards 9 and 10. In the machine of Fig. 1, I show two switches and the mechanism necessary to operate them although it is

evident that only one switch may be used or a greater number than two as desired. All of the switches are preferably mounted on the common block 8 which may be of slate or other suitable material. A shaft 11 is journaled at 12 and 13 in the standards 9 and 10 and carries an operating wheel 14 for each switch. The preferred form of drive comprises a gear 15 mounted on the shaft 11 and a worm 16 suitably arranged to engage the gear 15. A pulley 17 connected to the worm 16 may be driven in any suitable way preferably at uniform speed. Referring also to Figs. 2, 3, and 4 I show more in detail one of the switches and the manner in which it is operated by means of the corresponding operating wheel. The type of switch illustrated is a double pole switch. Its two poles 18 and 19 are rigidly connected together, at one end by means of an insulating bar 20 and at the other end by means of an insulating block 21. This insulating block carries at each end a tight fitting sleeve 22 which is firmly attached to the block to prevent rotation and is provided with an arm 23 which has at its end a pair of ears 24 for engaging one of the blades of the corresponding pole of the switch. The block 21 is provided at each end with a shaft 26, these two end shafts being insulated from each other by means of the block. The block 21 carries near its center portion a form of escapement device 27 which includes a sleeve 28 rigidly attached to the block as by means of a screw 29, and levers 30 and 31. Each blade of the switch is provided at its end with a groove 32 adapted to engage the corresponding shaft 26 so that the latter in conjunction with the arm 23 and ears 24 may serve to provide a solid support for the blade which is secured to the arm as by means of a screw 33. Referring again to the operating wheel it is provided near its periphery with one or more segmental slots 34 in which may be attached pins 35 and 36 for operating the escapement mechanism of the corresponding switch.

Referring to Figs. 1 and 4 it will be seen that the arms 30 and 31 are off set from each other to such an extent that they may straddle the thin outer periphery 37 of the wheel in its portion which carries the pins 35 and 36. The pin 35 projects out from the wheel on the same side as the arm 31 and the pin 36 projects out on the opposite side to engage the arm 30. The lower portions of these arms are so formed that when the pin 35 strikes the lower portion of arm 31 the switch will be thrown open into the dotted line position of Fig. 2 and so that when the pin 36 afterward strikes the lower portion of the arm 30 which is in depressed position it will throw the same over in a manner to close the switch; thus the switch is suc-

sively opened and closed by means of the pins of the wheel 14. Evidently the switch may be opened and closed a number of times during one rotation of the wheel by placing thereon a sufficient number of pins; also the times of opening and closing the switch may be exactly regulated and varied by moving the pins 35 and 36 to the proper locations in the slots. The preferred form of pin is one which is provided with a nut 38 so that it can be easily clamped in any desired position.

In order to limit the opening movement of the switch its arm 31 may be provided with a stop 39 which strikes the lower face of the block 8. Each switch is pivoted to the block 8 by means of a pair of brackets 40 which serve also to carry the electric current. In order to insure a quick break in opening the switch the following arrangement may be used: Each bracket 40 is provided with a pin 41 and each sleeve 22 is provided with an arm 42 so placed that when the switch is in closed position the arm 42 will be practically in line with the pin 41 and the pivot center on which the switch rotates. A spring 43 connects the arm to the pin. These parts are so related that when the operating wheel starts to open the switch the spring will be practically inactive because the pin and arm are in line with the center of switch rotation. However as soon as the switch has been forced open a little ways sufficient to disengage it from the jaws, and thus relieve it of the large friction which it has with the jaws, the arm 42 will have rotated out sufficiently so that it is no longer in line with the pin 41 and the center of rotation and thereupon the spring will become active. Therefore by the time that the switch has been disengaged from the friction of the jaws the spring will have become sufficiently active to aid the force of gravity in opening the switch so quickly as to prevent any burning. On the other hand in closing the switch the spring will be under its greatest tension when the arm and pivot are in line with the center of rotation and this is the time when the spring is least active to cause rotation. This is also the time when the switch blades must be forced into frictional engagement with the jaws. Therefore, the switch can be closed with greatest facility and at the same time the springs will be most effective for securing a quick break when the parts are arranged substantially as illustrated and described. In order to increase the current carrying capacity of a switch of this type the area of contact between the blades and jaws must be increased. I prefer to do this by adding blades and jaws to each pole of the switch thus making it into a multiple contact switch. One construction is as illustrated in Fig. 4. When using the switch

for small current capacity only the blade 44 would be used, the nut 45 and screw 33 clamping it securely in position. When it is desired to add a blade 46 to the switch
 5 a spacing block 47 would be used to hold the blades apart at one end and a washer 48 would be used to hold them apart at the other end. Evidently by the use of spacing blocks and washers the number of blades
 10 may be increased indefinitely. The preferred form of spacing block is substantially as illustrated, being provided at one end with a groove 49 for engaging the pin 26 and at the other end with lugs 50 for en-
 15 gaging the upper and lower edges of the blades.

The preferred form of jaws and base is illustrated in Fig. 5. The base comprises a stem 51, collar 52 and lugs 53, 54 and 55.
 20 These lugs are so placed on the base that when jaws 56 are placed between them and against their outer faces they will be properly spaced in pairs to engage the blades 44 and 46 of the switch. A bolt 57 is used for
 25 holding the jaws rigidly between the lugs and to the base. Evidently when only one blade is to be used two of the jaws may be dispensed with. The number of jaws, however, can be increased by the use of
 30 washers or spacing blocks for holding them in correct positions. It is preferred also that two bolts 57 be used as illustrated in Fig. 2 in order to secure greater stiffness of parts. In order to increase the conductivity
 35 of the switches and to prevent burning of the shafts 26 and the bearings, and in order to insure that the springs 43 shall not carry such an amount of current as might injure them by heating them and thus removing
 40 their temper, I provide a flexible connection or pigtail 58 to connect each hub 22 directly with the corresponding bracket 40.

In Fig. 7 I illustrate a modified form of switch bearing and mechanism for insuring
 45 a quick opening of the switch. The modification consists in the provision of a cam 59 on each hub 22 and in the provision of a stiff spring 60 on the corresponding bracket 40 of proper shape and size to engage the
 50 cam 59. The cam and spring are so related that when the switch blade is in closed position, as shown by the full lines, the spring will be under the maximum stress and will tend to force the hub 22 sidewise
 55 thus bringing the shaft 26 into very firm contact with the corresponding bearing. This will reduce the resistance through the bearing to a very small value and at the same time will prevent arcing and burning
 60 at this point by reason of poor contact. Furthermore, it is not necessary to make use of a pigtail with this construction, and, therefore, the switch is simpler and cheaper to manufacture. The cam and spring are
 65 also so related that when the blade starts to

open toward the dotted line position the spring will immediately act on the cam surface to increase the opening effect, thus insuring a quick break at the instant when the blade leaves the jaws. For these reasons, 70 the construction shown in Fig. 7 is a desirable one, since it virtually combines in one construction the quick break feature with high conductivity.

I claim:

1. In a sign flasher the combination of a frame work, a pair of jaws secured thereto, a knife switch blade rotatably mounted thereon, an escapement mechanism connected to the knife switch for rotating it to open
 80 and close the same into and out of engagement with the jaws, a spring, a support for one end thereof connected to the frame work, a support for the other end thereof connected to the escapement mechanism substantially in line with the frame work support and the center of rotation of the switch when the switch is in closed position, an operating wheel and a plurality of pins thereon for engaging the escapement mechanism to throw the switch into and out of engagement with the jaws, substantially as described. 85

2. In a sign flasher the combination of a rotatable shaft, a wheel thereon, a knife switch mounted adjacent the wheel, a forwardly extending arm secured to the movable member of the knife switch and located to one side of the wheel, a rearwardly extending arm secured to the movable member
 95 of the knife switch and located to the other side of the wheel, a pin on the wheel laterally projecting in position to engage the first mentioned arm, and another pin on the wheel laterally projecting in the other direction to engage the other arm, to oscillate the movable member of the knife switch for opening and closing same, substantially as described. 100

3. In a sign flasher the combination of a rotatable shaft, an operating wheel thereon, a knife switch located adjacent the operating wheel, an escapement member secured to the movable member of the knife switch and provided with a pair of arms straddling the operating wheel, and each arm being
 110 provided with a suitably formed contacting surface, a pin on the operating wheel laterally projecting therefrom in position to engage the contacting surface of one arm, and another pin on the operating wheel laterally projecting therefrom in position to engage the contacting surface of the other arm, said pins being suitably located on the operating wheel with respect to each other
 115 in position to engage the arms of the escapement mechanism to oscillate the same for opening and closing the switch, substantially as described. 120

4. In a sign flasher the combination of a rotatable shaft, an operating wheel thereon, 130

an oscillatably mounted knife switch adjacent the operating wheel, an escapement mechanism secured to the movable member of the knife switch and provided with a pair of downwardly extending arms straddling the operating wheel, each arm being provided with a contacting surface, a pin on the operating wheel laterally projecting therefrom in position to engage the contacting surface of one arm, and another pin on the operating wheel laterally projecting therefrom in position to engage the contacting surface of the other arm, substantially as described.

5 5. In a sign flasher the combination of a rotatable shaft, an operating wheel thereon, an oscillatable knife switch suitably mounted adjacent the same, an escapement mechanism secured to the oscillatable member of the knife switch, and provided with a pair of arms straddling the operating wheel and each provided with a suitably formed contacting surface, a pin on the operating wheel laterally projecting therefrom in position to engage the contacting surface of one arm, a pin on the operating wheel laterally projecting therefrom in position to engage the contacting surface of the other arm, and a stop on the oscillatable member adapted to engage the stationary portion of the mechanism when the switch is in open position for limiting the amount of opening movement of the same, substantially as described.

10 6. In a sign flasher the combination of a rotatable shaft, an operating wheel on the same, an oscillatable knife switch suitably mounted adjacent the operating wheel, an escapement mechanism secured to the oscillatable member and provided with a pair of suitably formed arms straddling the operating wheel, and each provided with a suitably formed contacting surface, a pin laterally projecting from the operating wheel in one direction in position to engage the contacting surface of one arm, another pin laterally projecting from the operating wheel in position to engage the contacting surface of the other arm, and a stop on the

oscillatable member adapted to contact a stationary portion of the mechanism for limiting the amount of opening movement of the knife switch said arms and contacting surfaces being suitably formed with respect to the pins of the operating wheel so that the oscillatable member of the knife switch will be actuated to open and close the switch, substantially as described.

7. In a sign flasher the combination of a rotatable shaft, an operating wheel mounted on the same, a knife switch suitably mounted adjacent the operating wheel, an insulating hub secured to the oscillatable member of the knife switch, an escapement mechanism on the hub and provided with a pair of downwardly extending arms straddling the operating wheel, and each provided with a suitably formed contacting surface, a member laterally projecting from the operating wheel in position to engage the contacting surface of one arm, and another member laterally projecting from the operating wheel in position to engage the contacting surface of the other arm, substantially as described.

8. In a sign flasher the combination of a rotatable shaft, an operating wheel on the same, a double pole knife switch suitably mounted adjacent the operating wheel, an insulating hub rigidly secured to the oscillatable member of the knife switch between the blades thereof, an escapement mechanism on the insulating hub and provided with a pair of downwardly extending arms in position to straddle the operating wheel, a suitably formed contacting surface on each arm, a laterally projecting member on the operating wheel in suitable position for engaging the contacting surface of one arm, and another laterally projecting member on the operating wheel in suitable position for engaging the contacting surface of the other arm, substantially as described.

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