350-429
E297A
SR
XR 1,271,929

E. A. NELSON.

FOCUSING DEVICE FOR MOVING PICTURE MACHINES.

APPLICATION FILED JAN. 8, 1918.

1,271,929.

Patented July 9, 1918.

3 SHEETS—SHEET 1.

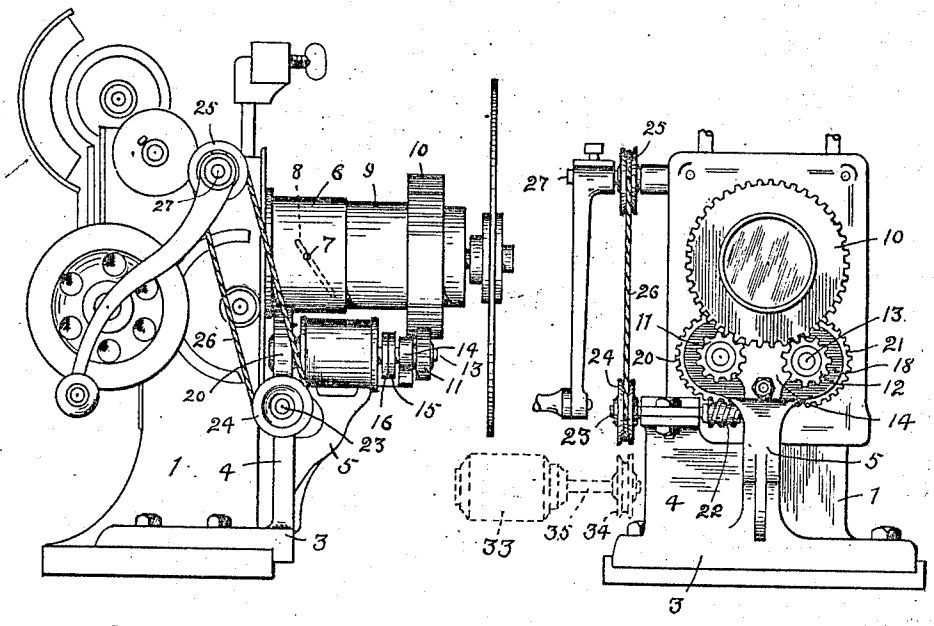


Fig. 1.

Fig. 2.

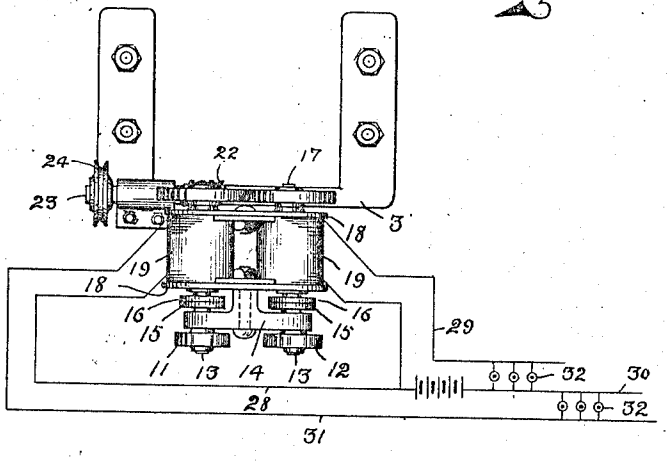


Fig. 3.

Inventor

Emil A. Nelson,

By Geo. Stevens.

Attorney

E. A. NELSON.

FOCUSING DEVICE FOR MOVING PICTURE MACHINES.

APPLICATION FILED JAN. 8, 1918.

1,271,929.

Patented July 9, 1918.

3 SHEETS—SHEET 2.

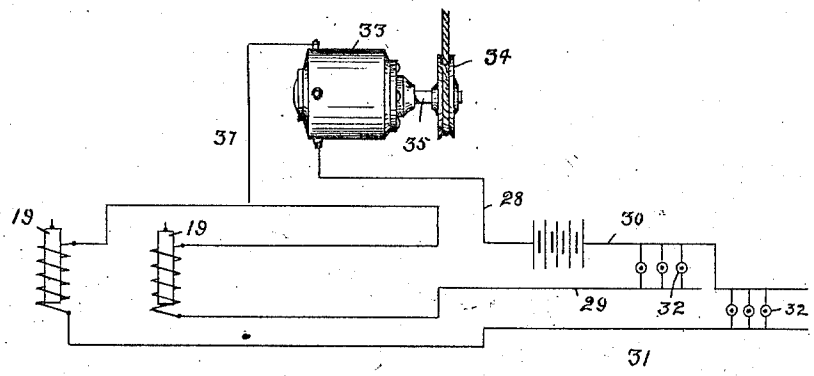
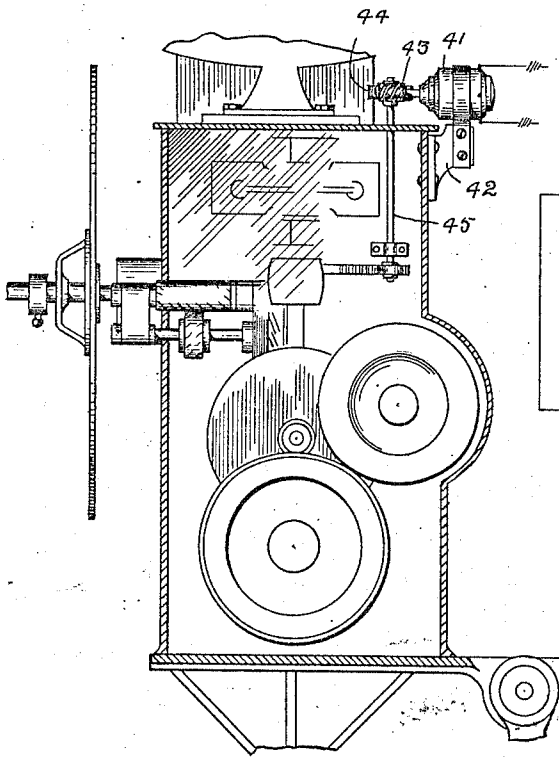


Fig. 4.



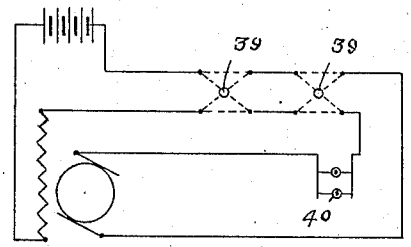


Fig. 5.

Fig. 6.

Inventor

Emil A. Nelson

By Geo. Stevens.

Attorney

E. A. NELSON.

FOCUSING DEVICE FOR MOVING PICTURE MACHINES.

APPLICATION FILED JAN. 8, 1918.

1,271,929.

Patented July 9, 1918.

3 SHEETS—SHEET 3.

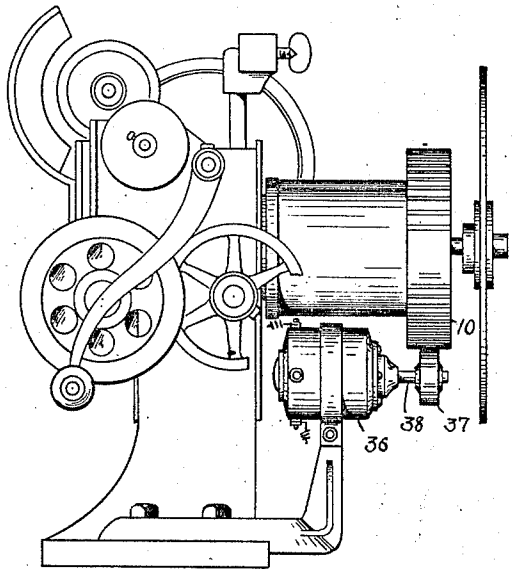


Fig. 7.

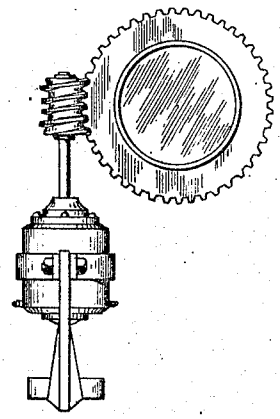


Fig. 8.

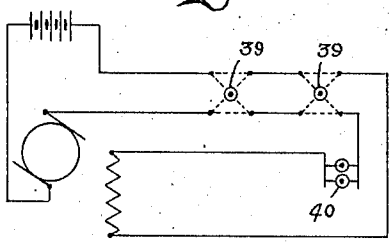


Fig. 9.

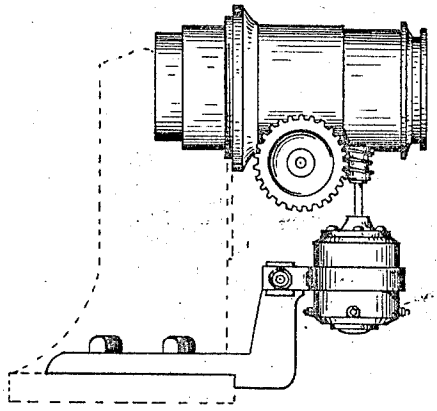


Fig. 10.

Inventor

Emil A. Nelson.

By Geo. Stevens.

Attorney

UNITED STATES PATENT OFFICE.

EMIL A. NELSON, OF DULUTH, MINNESOTA.

FOCUSING DEVICE FOR MOVING-PICTURE MACHINES.

1,271,929. Specification of Letters Patent. Patented July 9, 1918.

Application filed January 8, 1918. Serial No. 210,900.

To all whom it may concern:

Be it known that I, EMIL A. NELSON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Focusing Devices for Moving-Picture Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to focusing devices for motion picture machines, and has special reference to mechanical means directly connected with and operating the lens carrying tube or barrel and by which a picture projected from the machine is focused, said means being electrically controlled.

The principal object of the invention is to produce a simple and practical device of this character which may be readily applied to various makes of moving picture machines, such for example, as the Power's machine or the Simplex, which are illustrated in this application.

Referring to the accompanying drawing forming part of this application and in which like reference characters indicate like parts:

Figure 1 is a side elevation of a Power's head equipped with one form of my mechanically operating electrically controlled focusing devices,

Fig. 2 is a front elevation of same,

Fig. 3 is a top plan view of the mechanism detached from the picture machine,

Fig. 4 is a diagrammatic view of a wiring system for simultaneously controlling the motor and solenoids where the former is employed in the mechanism,

Fig. 5 is a diagrammatic view of one form of electric control and wiring system for the operating motor,

Fig. 6 is a side elevation of a Simplex moving picture head with a modified form of lens operating device.

Fig. 7 is a side elevation of a Power's head with a modified form of projecting lens and a still further modified form of operating device.

Fig. 8 is a front elevation of a projecting lens with a further modification of the operating mechanism,

Fig. 9 is a similar view to Fig. 5 of another form of control and wiring for the operating motor, and

Fig. 10 is a side elevation of a projecting lens equipped with a transverse shaft and wheel for adjusting the lens and to which I have shown attached an electric motor control similar to that shown in Figs. 6 and 8.

As the device and system of control illustrated in Figs. 1—2—3 and 4 are those specifically claimed in this application I will proceed to describe same.

1 represents a Power's moving picture machine head having a laterally projecting base portion 2 upon which is attached in any desired manner, a forwardly extending bracket 3. This bracket has upwardly projecting extensions 4 and 5 for supporting parts of the lens controlling mechanism.

The lens jacket or supporting tube is illustrated at 6, it having the usual screw 7, therein which extends into the diagonal slot illustrated at 8 in the lens carrying barrel 9, this construction being common in such projecting lenses.

10 represents a wide faced ring gear fixed in any desired manner to the rotatable lens barrel 9 and in this respect is similar to the construction shown in an application of even date herewith filed by me Jan. 8, 1918 and numbered 210,899.

Beneath the gear 10 and meshing therewith are two small horizontally spaced spur gears 11 and 12. These gears are supported upon and fixed to short shafts 13 loosely journaled in a suitable extension 14 of the bracket 5. The opposite ends of the shafts 13 have fixed thereto flat soft iron disks 15 which are at all times in close relation to similar disks 16 fixed to shafts 17 in direct axial alinement with the shafts 13. The shafts 17 are journaled within spaced extension 18—18 of the bracket extension 5 and between the extensions 18 and about each shaft is formed a magnetizing coil of wire 19, there preferably being a loose fitting sleeve, not shown, above each shaft and of suitable metal, upon which the coils are formed.

Thus the shafts 17 become the cores of the coils 19 and when the latter are electrically energized each coil and core constitute an electromagnet capable of attracting any susceptible object adjacent the core thereof. As before described, the disks 15 on the shafts 13 are each in close proximity to one of the disks 16 on its respective shaft

core 17 so that when either one of said cores is magnetized it will attract and hold fast, so long as the energizing influence continues, the disk 15 adjacent thereto. By this means each pair of alined shafts 13 and 17 may be electrically united or separated and their respective parts operated in unison or separately, the object of which will appear later.

Upon the inner end of each shaft 17 is fixed a driving spur gear, they being numbered 20 and 21. These gears are larger than the gears 11 and 12 and are of a diameter to properly intermesh at all times, the one 20 driving the one 21, though as is evident, they will revolve in opposite directions.

The gear 20 is driven by a suitable worm 22 fixed to the shaft 23 journaled in the extension 4 of the bracket 3 and the shaft 23 is illustrated as being driven by suitable sheaves 24 and 25 and belt 26, directly connected to the crank shaft 27 of the head 1.

By this arrangement, when the picture machine is operated, all of the rotatable apparatus is in motion except the two small gears 11 and 12 and their directly connected parts and when either one of the coils 19 is electrically energized the electromagnetic attractive force created in the respective shaft 17 will instantly hold in operative connection therewith the corresponding short shaft 13 and small gear meshing with the ring gear 10 thus imparting rotative motion to the lens carrying barrel so long as the electric circuit to said coil is closed. It is however understood that at no time is it necessary to keep either of the circuits closed except for but an instant as would ordinarily be accomplished by the pushing of a button and the direction of rotation of the lens barrel depends entirely upon which one of the coils 19 are energized.

As an electric connection to the coils 19 I have illustrated in Fig. 3 a three wire system comprising the neutral wire 28 leading from one pole of the battery and connected to one pole of each of the coils 19 while the opposite pole of one coil is connected with a wire 29 paralleling a second neutral wire 30 from the opposite pole to the battery and the other pole of the other coil 19 is connected with the wire 31 paralleling the neutral wire 30, and to which neutral wire the wires 29 and 31 are made electrically responsive by one or more suitable push buttons illustrated at 32.

It is obvious that the wires 29—30 and 31 may be led to any desired position or positions remote from the picture machine and from where the projecting lens may be instantly adjusted in either direction for properly focusing the picture.

In Fig. 2, I have illustrated in dotted line, at 33 an electric motor common to the trade and having a sheave 34 fixed to the protruding armature shaft 35. This sheave may be directly connected to the sheave 24 by a suitable belt and thus impart motion to the lens barrel operating device instead of deriving such motion from the crank shaft of the picture machine.

With this arrangement the mechanism would not be continuously operated and in some cases it may prove the more desirable form of operating power.

In Fig. 4, I have illustrated an operative wiring system for such a motor driven connection and which varies but slightly from that illustrated in Fig. 3 except that the motor 33 is installed within the electric circuit and operated simultaneously with the energizing of either one of the coils, the ultimate result being the same in both arrangements.

In Fig. 7, I have shown a motor 36 similar to the motor 33 directly connected with the ring gear 10 by means of a small spur gear 37 fixed to the armature shaft 38 of the motor and in which case the motor would have to be connected in such a manner as to be reversible. For this purpose I have diagrammatically illustrated in Fig. 9 one form of wiring system which will be readily understood by those skilled in the art.

Four-point switches 39 are shown in the electric circuit by which the direction of current in the field may be changed to reverse the motor. Push buttons are shown at 40, and as before related, any desired number of push buttons and switches may be installed, it being obvious that a switch and button would be available at each location from whence focusing is accomplished.

In Fig. 5, is shown a well understood modification of the wiring system and by which the current may be reversed in the armature instead of the field.

In Fig. 6, I have shown a motor operated focusing attachment upon a Simplex machine in which the focusing is accomplished by adjusting a thumb knob or wheel extending from the top of the machine housing. The motor 41 is supported upon any suitable form of bracket 42 and has fixed to the armature shaft a worm 43 which meshes with and drives the worm gear 44 fixed to the adjusting shaft 45 found upon such machines and to which the knob above referred to is customarily fixed.

In Fig. 8, is illustrated a slight modified form of motor and worm attachment operating a ring gear fixed directly to the lens barrel and which could be conveniently applied to the style of machine known to the trade as the Power's 6—B.

In Fig. 10, the upright motor with worm attached is shown as operating a projecting lens equipped with a transverse shaft under

the jacket which carries the lens barrel, said form of construction being common in the art.

I have illustrated the above various embodiments of my invention in order to more clearly show its adaptability to different machines and still other modifications and changes in details of construction within the scope of the invention may be resorted to without departing from the spirit thereof.

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

1. A device of the character described comprising in combination a motion picture machine having a reciprocable rotative projection lens extending therefrom; rotary power transmitting means journaled below the lens and in constant operative engagement with the barrel carrying the lens, means for furnishing power to the transmitting means, whereby the lens barrel may be rotated in either direction.

2. The combination with a motion picture machine having a rotatable projection lens carrying barrel and a spur gear, fixed to said barrel, of two smaller spur gears constantly in mesh with the larger gear, means for intermittently mechanically operating the smaller gears, electric means for controlling said intermissions and means remote from the machine for controlling said electric means.

3. The combination with a motion picture machine having a rotatable projection lens carrying barrel with a ring gear attached thereto for rotating same, of rotative mechanical means upon either side of the ring gear and below the center of same, means for imparting constant rotating motion to said mechanical means and electric means for alternately and intermittently engaging the ring gear with the rotating means, whereby the projection lens may be adjusted in either direction for focusing purposes.

4. The combination with a motion picture machine having a rotatable projection lens carrying barrel with a ring gear attached thereto, of two small short shafts in parallel axial alinement with the ring gear, small spur gears on the outer ends of said short shafts and in constant engagement with the ring gear, disks fixed to the inner ends of said shafts, two other longer shafts in axial alinement with the shorter shafts, disks close to the first mentioned disks and fixed to the ends of the longer shafts, magnetic spools of wire about the longer shafts and in which the latter are rotatable, large intermeshing spur gears fixed to the opposite ends of the longer shafts and by which the latter are rotated in opposite directions, means for imparting motion to the large gears, an electric circuit for energizing each magnetic coil separately for electromagnetizing the longer shafts thereby causing the one so energized to adhere tightly to the adjacent short shaft and cause it to rotate in unison therewith and means within the electric circuits for alternately and intermittently controlling said circuits substantially as and for the purpose described.

5. The combination with a motion picture machine having a rotatable lens carrying barrel for focusing purposes, of rotary driving means in constant engagement with the barrel and by which the latter may be rotated in either direction and means for electrically intermittently and alternately controlling the rotary means.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

EMIL A. NELSON.

Witnesses:
W. H. DENHAM,
S. GEO. STEVENS.