A. PAYNE.

HEADLIGHT TURNING MECHANISM.

APPLICATION FILED OCT. 23, 1919.

1,354,062.

Patented Sept. 28, 1920.

2 SHEETS—SHEET 1.

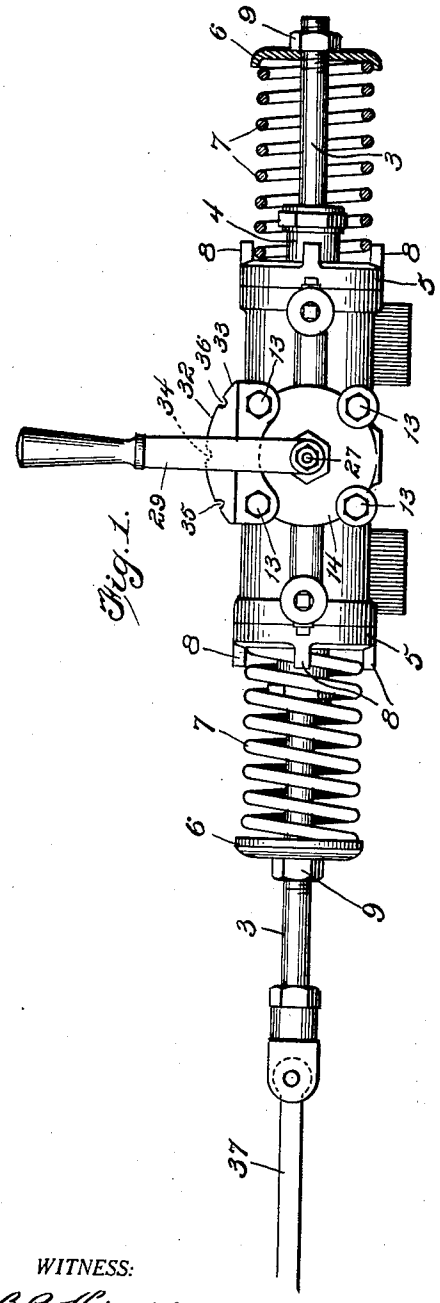


Fig. 1.

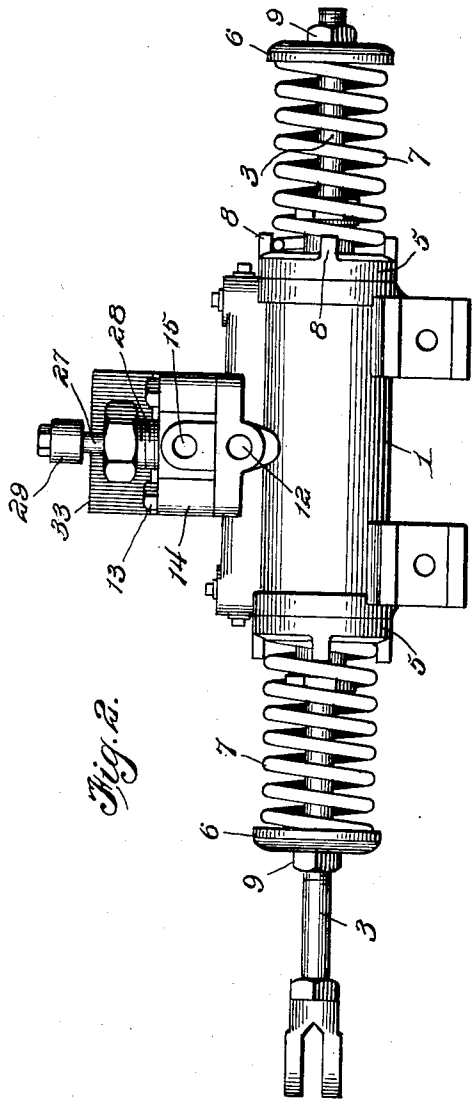


Fig. 2.

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Fig. 4.

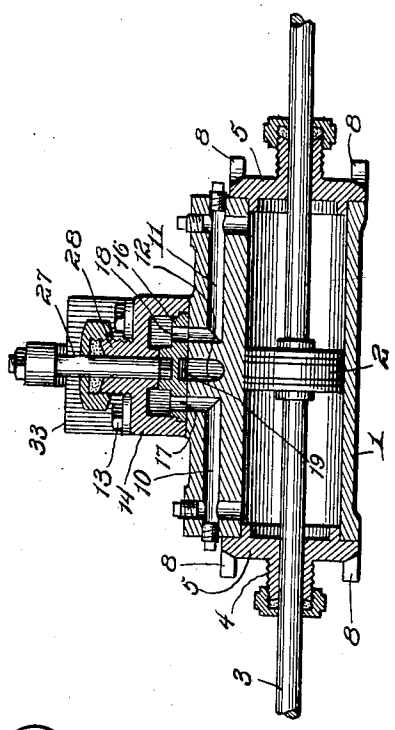


Fig. 7.

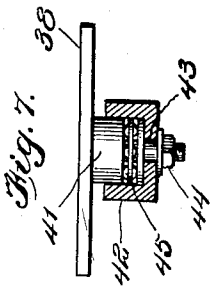


Fig. 5.

Fig. 3.

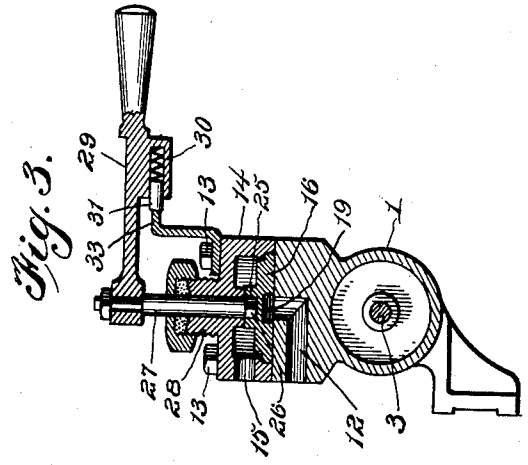
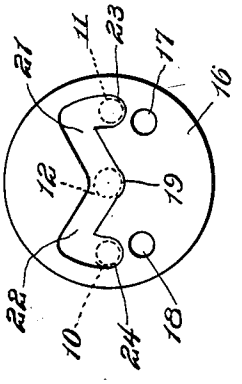


Fig. 6.



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UNITED STATES PATENT OFFICE.

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HEADLIGHT-TURNING MECHANISM.

1,354,062. Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed October 23, 1919. Serial No. 332,629.

To all whom it may concern:

Be it known that I, ALFRED PAYNE, a subject of the King of Great Britain, residing at Quebec, in the Province of Quebec, Dominion of Canada, have invented new and useful Improvements in Headlight-Turning Mechanism, of which the following is a specification.

This invention relates to a novel and improved headlight turning mechanism for use particularly on locomotives, interurban cars, etc., equipped with air brakes, the primary object of the invention being to provide a lamp turning mechanism which may be operated by air under pressure from the air brake mechanism.

A further object of the invention is to provide a simple, reliable and efficient construction of turning mechanism which may be operated to adjust the lamp in either direction to the exact degree required to cast the rays of light upon the track ahead.

A still further object of the invention is to provide a lamp turning mechanism which is not liable to get out of order and may be installed and maintained in working order at a comparatively low cost.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a top plan view of the cylinder and coöperating parts of the lamp turning mechanism.

Fig. 2 is a side elevation of the same.

Fig. 3 is a vertical transverse section through the cylinder and valve casing on the line of the exhaust port.

Fig. 4 is a vertical longitudinal section through the same.

Fig. 5 is a top plan view of the headlight and parts connected therewith.

Fig. 6 is a bottom plan view of the controlling valve.

Fig. 7 is a detail section showing the anti-friction bearing on which the headlight is mounted.

In carrying my invention into practice I provide a lamp turning mechanism comprising a cylinder 1 within which is arranged a piston 2 carried by a rod 3 extending longitudinally of and outwardly beyond both ends of the cylinder through suitable stuffing boxes 4 carried by heads 5 detachably secured to and closing the ends of the cylinder.

The outwardly projecting ends of the rod 3 on opposite sides of the cylinder are provided with abutment disks or heads 6, between which and the ends 5 of the cylinder are arranged coiled springs 7. The springs surround the rod 3 and the inner ends thereof bear against the heads 5 and are held in engagement therewith by lugs 8 carried by said heads, while the outer ends of the springs bear against the abutments 6, the springs being of like character and adapted to oppose counteracting resistances to the movement of the piston 2, whereby the piston is adapted to be normally maintained in a neutral position centrally of the cylinder 1, as shown in Fig. 4. The abutments 6 are loosely fitted on the rod 3, the ends of which are threaded to receive adjusting and confining nuts 9 by which said abutments are held from outward displacement and by means of which the abutments may be adjusted to regulate the tension of the springs. By this means any variations in the working pressures of the springs may at all times be compensated for to secure an accurate working action of said springs.

The cylinder is provided with ports and passages 10 and 11 respectively which open through the top of the cylinder immediately on opposite sides of the center thereof and communicate at their outer ends with the outer ends of the cylinder, and said cylinder is also provided with an exhaust passage 12 common to the passages 10 and 11 and opening through one side of the cylinder and also through the top thereof between the inner ends of the passages 10 and 11. Mounted upon the top of the cylinder and detachably secured thereto, as by suitable fastening screws 13, is a valve chest or casing 14 provided with an air inlet and feed port 15. Rotatably mounted within the chest or casing 14 and between the same and the top of the cylinder is a controlling valve 16. This valve consists of a circular disk provided with a pair of feed ports 17 and 18, an exhaust port 19, and grooves 21 and 22 communicating at their inner ends with said exhaust port 19 and terminating at their outer ends in pockets 23 and 24. The top of the valve disk is provided with an angular socket 25 to receive the angular end 26 of a stem 27. This stem 27 extends upwardly

through a stuffing box 28 and carries at its upper end a controlling lever 29. The lever 29 is provided with a socket 30 in which is slidably mounted a spring actuated detent 31. The outer end of this detent is adapted to ride in contact with the arcuate edge 32 of a locking segment 33 carried by the valve casing, said locking segment being provided with locking notches 34, 35 and 36 with which said detent is adapted to engage to hold the lever in central or neutral position and in reverse operative positions. The construction is, however, such that upon applying a certain degree of turning force to the lever the detent will slide out of engagement with any notch with which it is engaged and snap into engagement with another notch upon coming into registry therewith.

Coupled to one end of the piston rod 3 is a connecting rod 37 for transmitting motion to the headlight 38, said headlight being provided at one side with a crank arm 39 pivotally coupled to the connecting rod 37 by a link 40. When the rod 37 is moved longitudinally in one direction or the other by the movements of the piston 2 motion will be communicated through the link 40 and crank arm 39 to the headlight 38 to swing said headlight in one direction or the other and to a degree proportionate to the degree of longitudinal movement of the rod 37. The link 40 has its concaved side facing the headlight 38 and is bowed or curved so as to be offset out of the direct line of the rod 37 in such manner as to permit the adjacent corner edge of the headlight 30 in rear of the crank arm 39 to swing toward the link, in one of its directions of motion, without the link coming in contact with the headlight or interfering with its adjustment. The headlight is rotatably mounted, being provided for this purpose upon its base with a depending boss or stem 41 journaled in a socketed bearing member 42, said boss 41 having a stem 43 projecting downwardly through and rotatable in an opening in the base of said bearing member and being fitted with a retaining nut 44 whereby the boss is held in applied position. Antifriction bearings 45 are provided in the bearing socket 42 to permit the headlight 38 to have free and easy turning movements.

In practice the cylinder 1 is suitably secured within the cab of the locomotive or car and the feed port 15 is connected with the main air reservoir of the air brake mechanism or some other suitable source of compressed air supply, the controlling lever 29 being arranged within convenient reach of the engineer or motorman so that he may operate the valve 16 for the purpose of adjusting the headlight as occasion may require to keep the rays of light constantly ahead upon the track. When the headlight is in normal or neutral position, in which position it is adapted to project its rays straight ahead along a line of straight track on which the locomotive or car is running, the lever 29 is in the position shown in Figs. 1 to 4, inclusive, from which it will be seen that the detent 31 is in engagement with the central locking notch 34. In this position of the parts the pockets 23 and 24 of the valve communicate with the ports 10 and 11 of the cylinder, thus connecting both ends of the cylinder through said pockets 23 and 24, grooves 21 and 22 and port 19 in the valve with the cylinder exhaust port 12, while at the same time the ports 17 and 19 are arranged out of alinement with the ports 10 and 11 and hence in cut-off position. By however turning the lever 29 in one direction or the other from its central or neutral position into position to cause the detent 31 to engage either the notch 35 or the notch 36, the valve 16 will be adjusted to bring the port 17 into registry with the passage 10 or the port 18 into registry with the passage 11, thus supplying air through one or the other of said passages to one end of the cylinder to move the piston 2 in one direction. It will be observed that the ends of the grooves 21 and 22 communicating with the pockets 23 and 24 extend on arcs concentric with the center of motion of the valve and are so arranged that when the valve is adjusted to register the port 17 with the passage 10 the pocket 24 will be moved out of registry with the port 10, thus cutting off communication between said port and the exhaust port 12, while at the same time the port 23 will be maintained in registry with the passage 11 to allow the air to exhaust from the inactive end of the cylinder. the operation being the exact reverse when the valve is adjusted in the opposite direction, that is, to bring the port 18 into feed connection with the passage 11. The piston will thus be moved in one direction or the other in the cylinder against the resistance of one or the other of the springs 7, whereby the headlight 38 will be turned on its axis in one direction or the other, the construction being such also that when the lever is moved back to neutral position the previously compressed spring will adjust the piston back to neutral position against the pressure of the air previously admitted to one end of the cylinder, the valve at the same time being adjusted to connect such end of the cylinder with the exhaust port for the exhaust of air to the atmosphere. It will be obvious, from the foregoing description, that the valve handle and valve may be adjusted from neutral in opposite directions to the two extremes of movement described or may be adjusted to lesser degrees to vary the degree of register of the ports 17 and 18 with the passages 10 and 11 so that the amount of

air admitted to the ends of the cylinder may be graduated to adjust the headlight to any degree desired in either direction in its arc of motion. The operation being entirely under the control of the engineer or motorman it will also be apparent that the headlight may be accurately adjusted at all times to throw the light ahead either along a straight portion of the track or upon curved portions of different radii so that a clear view of the track ahead may always be obtained. The device is thus adapted to enable the headlight to be adjusted to overcome the objections to mechanically operated headlights which have no compensating adjustments for curves of the same radius but different pitch.

It will be evident that the invention provides a pneumatically operated headlight adjusting mechanism which is simple of construction and therefore may be manufactured and installed at a low cost, and which also by reason of its simplicity of construction may be economically maintained in prime working order. In installing the device it is simply necessary to connect up the headlight with the rod 37, mount the cylinder within the cab portion of the locomotive or car and suitably connect the feed port 15 with the main air reservoir or some other suitable portion of the air brake mechanism.

Having thus fully described my invention, I claim:—

1. In a lamp turning mechanism, the combination of a lamp pivoted to swing upon a vertical axis, a cylinder provided with end heads and having supply and exhaust ports communicating with the opposite ends thereof, a rod slidable through said end heads and movable longitudinally of the cylinder, a piston carried by said rod and operating within the cylinder, abutments upon the projecting ends of the rod, springs surrounding the opposite ends of the rod between the abutments and end heads of the cylinder for resisting movement of the piston in opposite directions and for normally maintaining said piston in a position centrally of the cylinder, connecting means between the rod and lamp, and valve mechanism controlling the supply and exhaust of fluid to and from the ends of the cylinder.

2. In a lamp turning mechanism, the combination of a lamp pivoted to swing upon a vertical axis, a cylinder having end heads provided with retaining lugs, a rod slidable through the end heads of the cylinder, a piston upon said rod and operating in the cylinder, abutments upon the projecting ends of the rod, springs disposed between said abutments and the end heads of the cylinder and retained in position by said lugs, means for adjusting the abutments to regulate the tension of the springs, connecting means between the rod and the lamp, and valve mechanism controlling the supply and exhaust of fluid pressure to and from the ends of the cylinder.

3. In a lamp turning mechanism, the combination of a lamp pivoted to swing upon a vertical axis, a cylinder having fluid supply and exhaust passages communicating with the opposite ends thereof, a rod slidable through the ends of the cylinder, connecting means between the rod and the lamp, a piston carried by said rod, springs acting upon the ends of the rod to resist sliding motion thereof in opposite directions and normally maintain the piston in a central position within the cylinder, a valve casing having feed and exhaust ports, a valve therein operative in reverse movements to alternately connect the supply and exhaust passages of the cylinder with the said supply and exhaust ports and to connect both of said passages with the exhaust port when the cylinder is in central position, and means for operating the valve.

4. In a lamp turning mechanism, the combination of a lamp pivoted to swing upon a vertical axis, a cylinder having supply and exhaust passages communicating with the opposite ends thereof, a rod slidable longitudinally through the cylinder, connecting means between the rod and the lamp, a piston operating in the cylinder and carried by said rod, springs operating upon the ends of the rod to resist reverse movements thereof and act thereon to normally maintain the piston in a central position within the cylinder, a valve casing having fluid supply and exhaust ports, a rotary valve having feed ports for connecting the supply and exhaust passages of the cylinder with said feed port and having an exhaust port with branches arranged for connecting the supply and exhaust passages of the cylinder with the exhaust port when the piston is in central position and for connecting one of said passages with the exhaust port and the other with the feed port when the valve is adjusted for movement of the piston in one direction or the other, and means for operating said valve.

In testimony whereof I affix my signature.

ALFRED PAYNE.