

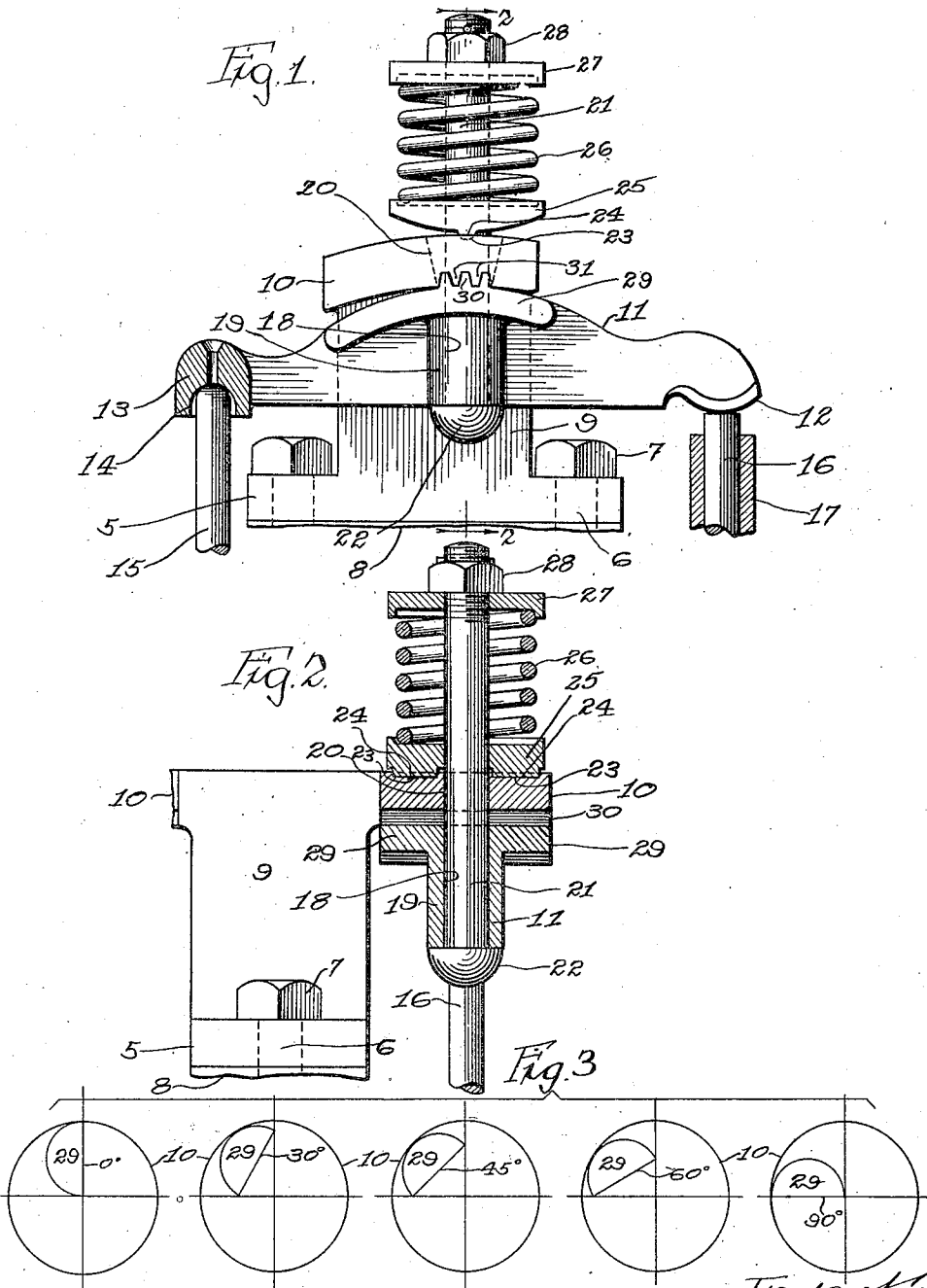
June 10, 1924.

1,497,451

J. F. KYTLICA

ROCKER ARM

Filed Aug. 29, 1923



Inventor
John F. Kytlica
By Chas. J. Illman
Attor.

UNITED STATES PATENT OFFICE.

JOHN F. KYTLICA, OF CHICAGO, ILLINOIS.

ROCKER ARM.

Application filed August 29, 1923. Serial No. 659,929.

To all whom it may concern:

Be it known that I, JOHN F. KYTLICA, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rocker Arms, of which the following is a specification.

This invention relates to improvements in rocker arms in general, but has particular relation to that type of such arms employed in the operating mechanism for the intake and exhaust valves of engines, which, while being shown in the accompanying drawing in connection with a portion of an engine (preferably of the internal combustion type), and valve operating mechanism thereof, and will be hereinafter so referred to, yet it is applicable for use for other valves and other purposes without departure from the spirit of the invention, and for this reason I wish it to be understood the invention is not limited in its application to any specific use or purpose, or to the exact location, construction and arrangement of its parts as shown and described, except, where so specified in the claims hereto appended.

The principal object of the invention is, the provision of a rocker arm of the above mentioned general character, which shall be simple and inexpensive in construction, strong, durable and highly efficient in operation, with its parts so made, arranged and co-operating with one another, as well as with the operating-rod of the valve to be actuated, in such a manner, that said operating-rod will be caused to be moved longitudinally or reciprocated in an absolutely straight, and usually vertical line, to the end, that any and all lateral or wobbling movement of said rod will be prevented, thereby obviating wear of the rod and its guide, incident to the movement of the said rod through its guide, which wear takes place in the old style or commonly used type of devices for operating valves and permits the passage of air through the guide for the rod controlling the intake valve, to commingle with and deleteriously affect the explosive mixture used in the engine.

Another object of the invention is the provision of means for yieldingly, automatically and accurately holding co-operating parts of the device in their proper operative positions and against accidental disarrangement.

Other objects and advantages of the in-

vention will become apparent from the following description and explanation, which will be more readily understood when read in conjunction with the accompanying drawing, in which an embodiment of which the invention is susceptible is illustrated, it being understood that changes and modifications may be resorted to without departing from the spirit of the invention, so long as they come within the scope of the appended claims forming a part hereof.

The invention consists in certain peculiarities of the construction, novel arrangement and combination of the parts thereof as will be hereinafter more fully set forth and specifically claimed.

Referring to the drawing,—

Fig. 1 is a side view partly in section of a rocker arm constructed according to my invention, showing it mounted on a fragment of the upper portion of an engine.

Fig. 2 is a view partly in elevation and partly in vertical section taken on line 2—2 of Fig. 1 looking in the direction indicated by the arrows, and

Fig. 3 is a diagrammatical view showing the principle of the operation of the device or various positions assumed by one of the bearing members with respect to the other bearing member in the operation of the device.

Corresponding numerals of reference refer to like parts throughout the different views of the drawing.

The reference numeral 5 designates the supporting base for the rocker arm, which as shown in Figs. 1 and 2 is secured by means of bolts 6 and nuts 7 to the upper portion of an engine 8, which engine may be of any well known type having the intake and exhaust valves thereof located on its opposite sides.

The supporting base 5 has an upright portion 9 from each side of the upper portion of which is horizontally extended a cross-sectionally curved or upwardly arched supporting member 10 on which one of the rocker arms 11 is mounted for oscillation. As the arms 11 and their supporting members are of the same construction, a description of one of each of them will be sufficient for a clear understanding of the device.

As shown in Figs. 1 and 2, the rocker arm 11 has at one of its ends an arcuate or downwardly curved shoe 12 and at its other end an enlargement 13 which is provided in its

lower surface with a socket 14 for the reception and operation of the upper end of one of the rods 15 of the valve operating mechanism, which rod extends upwardly from the cam shaft and is reciprocated thereby in the well known way. Impinging at its upper end against the arcuate or downwardly curved shoe 12 is an operating rod 16 for either the intake valve or exhaust valve of the engine, which rod is mounted for reciprocation in a tubular guide 17 communicating with the valve casing, not shown. The arm 11 is provided midway between its ends with a vertical opening 18 formed in a vertical enlargement 19 of said arm, which opening registers at its upper end with the lower end of a vertical and laterally enlarged opening 20, (see Figs. 1 and 2) extended through the arm supporting member 10, and is for the reception and retention of a rod 21 which has on its lower end a head 22 to contact with the lower edge of the arm 11 or rather with the lower end of the enlargement 19 of said arm. As shown, the rod 21 is extended a considerable distance above the upper surface of the member 10 and has its upper portion screw-threaded. The arm supporting member 10 has in its upper surface on opposite sides of the opening 20 in said member a longitudinally disposed recess 23, which recesses are by preference cross-sectionally segmental in shape and are for the reception and operation of downwardly extended projections 24 which are located on the lower surface of an apertured keeper 25 for the rocker arm, which keeper surrounds the rod 21 and as shown is mounted with its projections 24 in the recesses 23 in the upper surface of the member 10. The projections 24 of the keeper 25 are a little short of the length of said recesses, so that they may fit snugly in said recesses yet in such a way as to prevent movement of the keeper in the direction of the length of its projections. By this arrangement it is manifest that bearings for the keeper 25 having small area, will be provided. Surrounding the rod 21 and resting at one of its ends on the upper surface of the keeper 25 is a coil spring 26, the other end of which rests against the lower surface of a washer or collar 27 loosely mounted on the upper portion of said rod and adjustably held in place by means of a nut 28 employed for adjusting the tension of said spring. On each of its sides and at about the middle of the upper portion thereof, the arm 11 is provided with a laterally and horizontally disposed arcuate or upwardly arched bearing member 29, each of which has on its upper surface one or more upwardly extended gear teeth 30 to mesh with gear teeth 31 on the lower surface of the supporting member 10, for the purpose of holding said members in such a way that the members 29 may oscillate on

the lower surface of the member 10 without danger of slipping or becoming accidentally disarranged with respect to one another.

As shown in Fig. 1, and as above recited, each of the members 10 and 29, is preferably cross-sectionally curved or upwardly arched, but it will be understood that it is not essential that they shall be bodily so shaped, but it is important that their adjacent surfaces shall be so shaped or constructed, and it is also important that the upper surfaces of the members 29, shall each be in an arc of a circle one half of the circumference of which shall equal one fourth of the circumference of the circle comprising the arc of the lower surface of the member 10, or in other words, the diameter of the circle including the arc of the upper surface of the members 29, shall equal one half of the diameter of the circle comprising the arc of the lower surface of the member 10, as will be readily understood by reference to the diagrammatical view shown in Fig. 3 of the drawing, in which the principle of the operation of the device is illustrated in an enlarged scale.

From the foregoing and by reference to the drawing, it will be readily understood and clearly seen that by my improvements and when the parts of the mechanism are assembled as shown in Figs. 1 and 2, the rocker arm designated as a whole by the numeral 11, will be resiliently held through the instrumentality of the rod 21, keeper 25, spring 26, and washer 27, so that the upwardly arched bearing members 29 of the arm will be in constant contact with the upwardly arched supporting member 10 for said arm, and when the gear teeth 30 and 31 are employed against accidental disarrangement, yet in such a manner that the arm 11 may be oscillated with respect to the supporting member 10 and that by reason of the novel and peculiar construction of the adjacent surfaces of the members 10 and 29, movement in an absolutely straight line will be imparted to the rod 16, which may be used for operating an intake or exhaust valve of the engine or any other suitable valve or device.

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

1. In a device of the class described, the combination with a supporting member, of a rocker arm provided with a laterally extended bearing member for oscillatory co-operation with one of the surfaces of said supporting member, the adjacent surfaces of said members being arcuate in the same direction but of different degrees, and means co-operating with said members for holding them in contact with one another.

2. In a device of the class described, the combination with a horizontally disposed

supporting member, of a rocker arm provided with a laterally extended bearing member for oscillatory co-operation with one of the surfaces of said supporting member, the adjacent surfaces of said members being arcuate in the same direction but of different degrees, and resilient means co-operating with said members for holding them in contact with one another for oscillatory movement of said bearing member with respect to said supporting member.

3. In a device of the class described, the combination with a horizontally disposed supporting member, of a rocker arm provided with a laterally extended and horizontally disposed bearing member for oscillatory co-operation with one of the surfaces of said supporting member, the adjacent surfaces of said members being arcuate in the same direction but of different degrees, inter-engaging means on the adjacent surfaces of said members, and resilient means co-operating with said members for holding them in contact with one another for oscillatory movement of the bearing member with respect to the said supporting member.

4. In a device of the class described, the combination with a supporting member, of a rocker arm provided with a laterally extended bearing member for oscillatory co-operation with one of the surfaces of said supporting member, the adjacent surfaces of said members being arcuate in the same direction but the arcuation of the surface of the said supporting member adjacent said bearing member being greater than the arcuation of the surface of the bearing member adjacent the supporting member, and means co-operating with said members for holding them in contact with one another for the oscillatory movement of the said bearing member.

5. In a device of the class described, the combination with a supporting member, of a rocker arm provided with a laterally extended bearing member for oscillatory co-operation with one of the surfaces of the said supporting member, the adjacent surfaces of said members being arcuate in the same direction but the arcuation of the surface of the said supporting member adjacent said bearing member being greater than the arcuation of the surface of the bearing member adjacent the supporting member, inter-engaging means on the adjacent surfaces of said members, and means co-operating with said members for holding them in contact with one another for the oscillatory movement of said bearing member with respect to said supporting member.

6. In a device of the class described, the combination with a horizontally disposed

supporting member having an opening therethrough, of a rocker arm having an opening to co-incide with the opening of said supporting member and a laterally extended bearing member for oscillatory co-operation with one of the surfaces of said supporting member, the adjacent surfaces of said members being arcuate in the same direction but of different degrees, and a spring actuated rod extended through said openings for holding said members in contact with one another for oscillatory movement of said bearing member.

7. In a device of the class described, the combination with a supporting member having an opening therethrough and on each side of said opening a recess extended longitudinally with respect to said member, of a rocker arm having an opening to co-incide with the opening of said supporting member and provided with a laterally extended bearing member on each of its sides for oscillatory co-operation with one of the surfaces of said supporting member, the adjacent surfaces of said members being arcuate in the same direction but of different degrees, a rod extended through said opening and having a head on one of its ends to contact with the rocker arm, an apertured keeper mounted on the rod adjacent the recessed surface of said supporting member and having a downwardly extended projection on each side of its aperture to fit in said recesses, a spring surrounding the rod and resting at one of its ends against said keeper, a washer movably mounted on said rod, and means adjustably engaging the rod and adapted for co-action with the said washer for adjusting the tension of said spring.

8. In a device of the class described, the combination with a supporting member having an opening therethrough, of a rocker arm having an opening to co-incide with the opening of said supporting member and provided with a laterally extended bearing member for oscillatory co-operation with one of the surfaces of said supporting member, the adjacent surfaces of said members being arcuate in the same direction but of different degrees, a rod extended through said openings and having a head to rest against one of said members, a spring surrounding said rod and exerting pressure at one of its ends against the member opposite the head of said rod, a washer movable on said rod at the other end of said spring, and adjustable means engaging said rod and co-acting with said washer for adjusting the tension of said spring.

JOHN F. KYTLICA.