E. H. SHERBONDY.

VALVE OPERATING MECHANISM.

APPLICATION FILED APR. 9, 1920.

1,365,735.

Patented Jan. 18, 1921.

Fig. 2

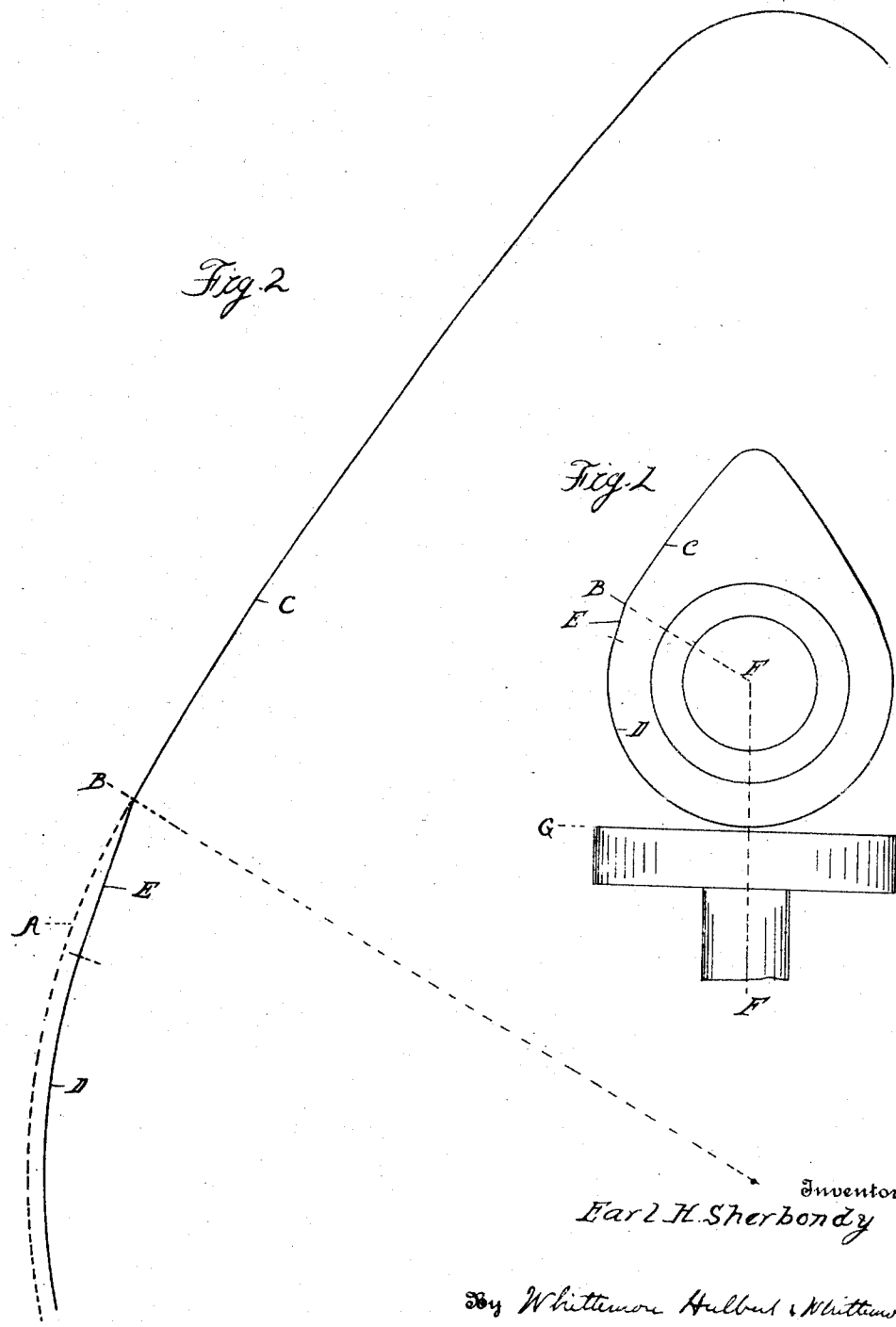


Fig. 1

Inventor

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EARL H. SHERBONDY, OF DETROIT, MICHIGAN, ASSIGNOR TO SIDNEY D. WALDRON, OF DETROIT, MICHIGAN.

VALVE-OPERATING MECHANISM.

1,365,735. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed April 9, 1920. Serial No. 372,642.

To all whom it may concern:

Be it known that I, EARL H. SHERBONDY, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Valve-Operating Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to valve operating mechanisms of that type in which the cam is in direct contact with a flat bearing on the stem of the valve and perpendicular to the axis thereof. It is the object of the invention to obtain a relatively noiseless construction together with sufficient clearance to avoid possibility of holding the valve from its seat. To this end the invention consists in the peculiar construction of the cam and its combination with the coöperating member, as hereinafter set forth.

In the drawings:

Figure 1 is an elevation of the cam and the coöperating valve stem; and

Fig. 2 is a diagram illustrating the construction of the cam.

In the designing of cams for valve operating mechanisms the lifting portion is initially tangent to a base circuit, so that in theoretical operation the contact with the coöperating member is formed at zero velocity. In practice, however, the clearance which is necessary to provide for expansion of the stem will cause the cam to contact with the coöperating member when moving at a considerable velocity. The greater the clearance, the higher the velocity, and consequently, the greater the noise made by contact. With my improved construction, instead of obtaining clearance by adjusting the coöperating member radially outward from the base circle, the cam is formed with its circular portion of a radius sufficiently less than that of the base circle to provide the necessary clearance. Also, there is arranged between this clearance portion and the initial point of the cam a flat face, which is tangent to the inner circle and passes through the initial point of the lifting portion of the cam.

As shown diagrammatically, the dotted circle A is the base circle used in the design of the cam, and the radial line B intersects this circle at the proper point in the angular movement of the cam for the initial lifting movement. C is the lifting portion of the cam, which starting tangent to the circle A is designed to produce the desired acceleration and lift in the proper angle of movement. D is a circle of lesser radius than the circle A, and E is a straight line drawn tangent to the circle D and passing through the common point in the lines B and C. The line F represents the axis of the valve stem, and the line G, which is perpendicular to the line F, is the face of a coöperating member on said valve stem with which the cam contacts.

With the construction as described, in initially setting the valve it may be given whatever clearance is deemed advantageous, which, however, is less than the radial distance between the circle D and the base circle A. If the clearance is small, the surface G of the valve will approach parallelism to the tangent line E when contact is first made, and consequently, (possibly due to the film of air therebetween) there will be but slight noise of contact. On the other hand, as the clearance increases during continued use, the line G will constantly approach the theoretical base circle A and when tangent to the latter, contact is effected at zero velocity.

It will be readily understood that with this construction the valve operating mechanism is not only noiseless when first set, but will continue to be noiseless as the clearance space increases. This is apparent from theoretical considerations, but it is also true in practice, and demonstration has shown, this form of valve operating mechanism to be unusually free from noise.

What I claim as my invention is:

1. In a valve operating mechanism, the combination with a movable member having a bearing face in a plane perpendicular to its direction of movement, of a cam having a lifting portion and a clearance portion with a straight line portion connecting the same and tangent to the clearance portion.

2. In a valve operating mechanism, the

combination with a movable member having a bearing face in a plane perpendicular to its direction of movement, of a cam having a lifting portion tangent to an imaginary base circle, a clearance portion which is of a radius less than that of said base circle, and a straight portion tangent to said clearance portion and passing through the point of tangency of said lifting portion with said base portion.

In testimony whereof I affix my signature.

EARL H. SHERBONDY.

Correction in Letters Patent No. 1,365,735.

It is hereby certified that the name of the assignee in Letters Patent No. 1,365,735, granted January 18, 1921, upon the application of Earl H. Sherbondy, of Detroit, Michigan, for an improvement in "Valve-Operating Mechanism," should have been written and printed as *Sidney D. Waldon* instead of "Sidney D. Waldron," as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 1st day of March, A. D., 1921.

[SEAL.]

L. B. MANN,

Acting Commissioner of Patents.

Cl. 74—1.