

Aug. 27, 1929.

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TAPPET

Filed Oct. 13, 1928

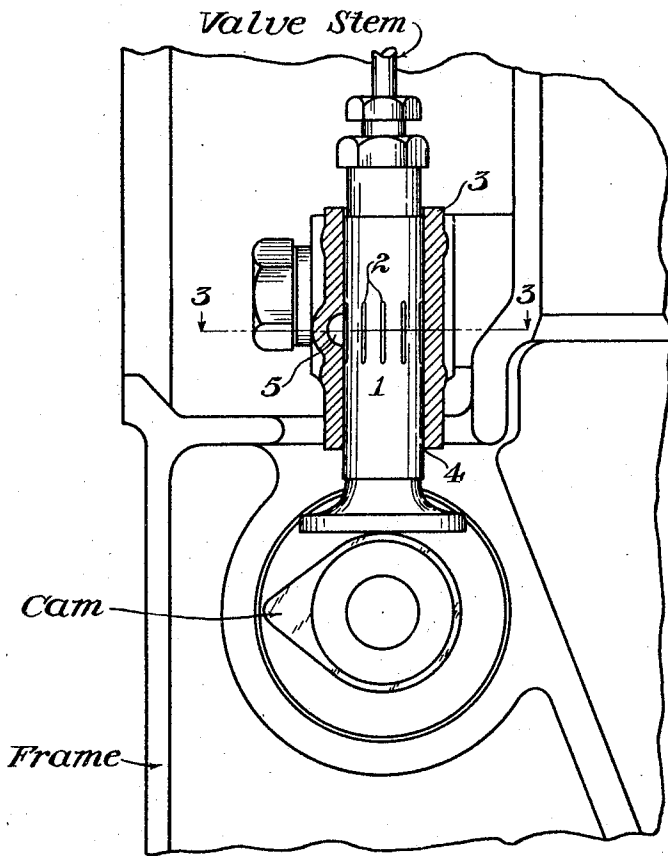


Fig. 1.

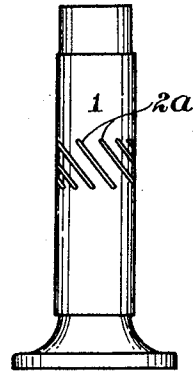


Fig. 2.

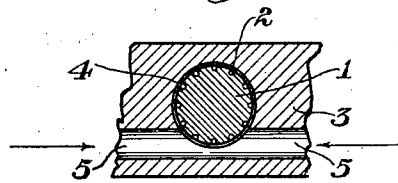


Fig. 3.

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UNITED STATES PATENT OFFICE.

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TAPPET.

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This invention is an improvement in reciprocatory tappets such as are commonly employed in internal combustion engines for translating the rotary movement of the engine cam into opening and closing movements of the poppet valves.

The object of the invention is to provide a simple and effective means for rotating the tappet during the normal reciprocatory movement thereof. The purpose of such rotation is to prevent uneven wear on the face of the tappet head caused by the rapid impingements of the cam against it and to prevent uneven wear in the bore of the housing that constitutes the bearing in which the stem of the tappet is slidably received.

A still further object of the invention is to so arrange the rotating means that in addition to the force exerted to turn the tappet a certain amount of lifting effort will also be exerted to urge the tappet toward the top of its travel and thereby tend to keep the tappet in closer contact with the end of the valve stem, thereby reducing the tendency to chatter under high speeds and minimizing valve spring vibration.

With the foregoing and certain other objects in view which will appear later in the specification my invention comprises the devices described and claimed and the equivalents thereof.

In the drawings Fig. 1 is a part sectional side elevation showing the preferred form of tappet installed on the frame of an engine.

Fig. 2 is a side view of a modified form of tappet embodying the invention.

Fig. 3 is a horizontal section on the line 3-3 of Fig. 1.

As is clearly shown in the drawings, the tappet is mounted in the usual way so as to be actuated up and down in a housing carried in the engine frame, its normal reciprocatory movement being derived from the engine cam.

The tappet is of ordinary construction, except that its stem 1 is formed with circumferentially spaced recesses 2 and 2^a. The stem is slidably received in the housing 3 which is formed with a bore 4 for that purpose. A channel 5, also formed in the housing, communicates tangentially, as shown in Fig. 3, with the bore 4. The purpose of the channel is to direct a stream of fluid under pressure, moving, say, in the di-

rection of the arrows in Fig. 3, against the walls of the recesses 2, whereby to rotate the tappet during its normal reciprocatory movement.

The stream of fluid under pressure is preferably lubricating oil and as it passes through the channel 5 its forward momentum causes a slight impingement in an approximately tangential direction against the walls of the recesses 2, resulting in a slight tendency to rotate the tappet about its longitudinal axis. Although the rotating tendency is slight it is effective because the lubricated surface of the tappet stem, on account of its normal reciprocatory movement, is practically in a frictionless floating condition.

The recesses 2 are preferably elongated and extend longitudinally so as to remain in communication with channel 5, regardless of the lengthwise movement of the tappet. The longitudinally extended recesses may be parallel with the axis of the tappet, as shown in Fig. 1, or if desired they may be at an angle thereto, as shown in Fig. 2. In this latter case a component of the tangential force caused by the impact of the stream of lubrication against the walls of the recess is delivered lengthwise the tappet and has the effect of tending to exert a continuous lifting force. The effect of this force is to tend to lift the tappet and consequently urge it toward the end of the valve stem.

The stream of oil under pressure appears to act in conjunction with the recessed walls of the tappet somewhat after the manner of rack and pinion and although the rotating force exerted on the tappet stem is slight it is ample for the purpose required.

The elongated grooves or channels 2 and 2^a also perform the further function of oil grooves to distribute the oil from the channel 5 over the interior walls of the bore of the housing.

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

1. In combination, a tappet the peripheral face of whose stem is formed with circumferentially spaced recesses, a housing formed with a bore to slidably receive the stem and having a channel communicating tangentially with said bore for directing a stream of fluid under pressure against the walls of said recess whereby to rotate the tappet

during the normal reciprocatory movement thereof.

2. In combination, a tappet the peripheral face of whose stem is formed with longitudinally extending circumferentially spaced recesses, a housing formed with a bore slidably receiving the stem and formed also with a channel that communicates with said bore whereby a stream of fluid impelled through said channel under pressure is directed against the walls of said recesses to effect rotation of the tappet during the normal reciprocatory movement thereof.

3. In combination, a tappet, a housing formed with a bore to slidably receive the stem of the tappet and fluid-actuated means associated with the housing for rotating the tappet during the normal reciprocatory movement thereof.

4. A tappet whose stem is adapted to be rotated, during its normal reciprocatory movement, by impingement tangentially thereagainst of a stream of fluid in motion.

5. A tappet whose stem is adapted to be rotated, during its normal reciprocatory movement, by impingement thereagainst of a stream of fluid under pressure.

6. A tappet whose stem is adapted to be rotated, during its normal reciprocatory movement, by the contact and pressure thereagainst of a moving stream of lubricant.

7. A tappet stem formed with circumferentially spaced recesses in its peripheral wall, for the purposes set forth.

In testimony whereof, I affix my signature.

ROBERT H. DAISLEY.