March 4, 1952 J. A. BRAZUKAS 2,587,962

FLEXIBLE JOINT

Filed June 2, 1950

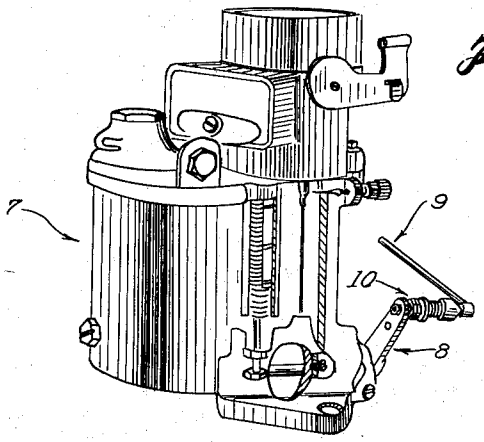

Fig. 1

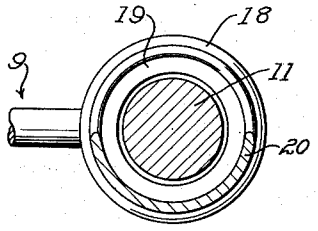

Fig. 4

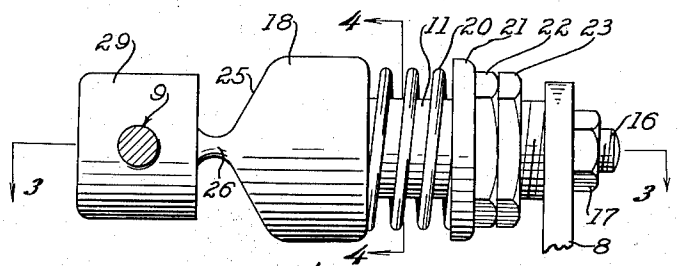

Fig. 2

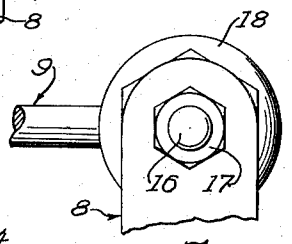

Fig. 5

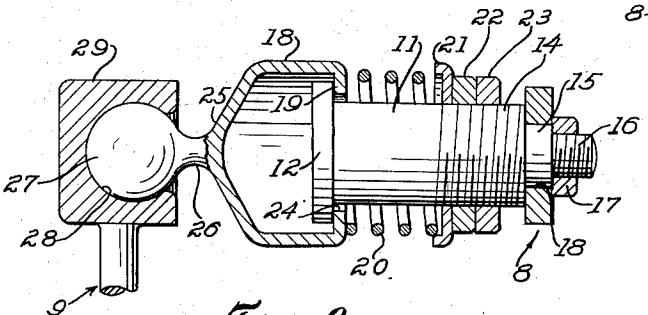

Fig. 3

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FLEXIBLE JOINT

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1 Claim. (Cl. 287—91)

1

This invention relates to an improved flexible joint of the ball-and-socket type, and more particularly to such a joint for effecting a flexible connection between the throttle lever of an internal combustion engine carburetor and the throttle, or the accelerator pedal linkage, in the case of an automobile engine, the primary object of the invention being to provide means whereby, upon sudden opening or closing actuation of the throttle or accelerator pedal, transmission to the carburetor throttle lever of the action of the linkage will be cushioned and graduated rather than direct and jerky, whereby the engine is desirably accelerated or decelerated more gradually and more smoothly, and gasoline consumption of the engine is reduced as well as wear and tear upon the carburetor mechanism.

Another important object of the invention is the provision of an arrangement of the character indicated above which substantially eliminates sudden and jerky operation of automobiles and the wear and tear upon the clutches, transmissions, springs, and rear ends thereof otherwise occurring, as well as substantially reducing the fatigue of the driver and passengers in automobiles.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, merely for purposes of illustration, a specific form of the invention is set forth in detail.

In the drawings, wherein like numerals designate like parts throughout the several views:

Figure 1 is a perspective view of a carburetor equipped in accordance with the present invention;

Figure 2 is an enlarged fragmentary side elevation of the joint;

Figure 3 is a transverse longitudinal section taken on the line 3—3 of Figure 2.

Figure 4 is a transverse vertical section taken on the line 4—4 of Figure 2;

Figure 5 is a fragmentary right-hand end elevation of Figure 2.

Referring in detail to the drawings, the numeral 7 generally designates a conventional form of automobile engine carburetor having a throttle lever 8 operating on a horizontal axis, and arranged to be moved in opposite directions to open and closed positions by a rod or link 9 which is part of a conventional throttle or accelerator pedal-operated linkage (not shown).

Instead of the usual direct and relatively inflexible connection between the outer end of the

2

carburetor throttle lever 8 and the control rod or link 9, I provide the novel flexible joint 10.

The joint 10 comprises a smooth, cylindrical shank 11 having an annular, laterally projecting head or shoulder 12 on one end and being threaded, as indicated at 14, at its other end.

A smooth, cylindrical boss 15 of reduced diameter projects axially outwardly from the end 14 of the shank 11 and from the boss 15 an axial threaded stud 16, smaller in diameter than the boss 15, projects and carries a nut 17. The boss 15 is adapted to rotatably engage in the hole 18 usually present in the outer end of the throttle lever 8, and the nut 8 is adapted to be tightened on the stud 16 to assemble the lever 8 and shank 11 for relative rotation without substantially endwise or sidewise relative movement therebetween.

Loosely circumposed on the headed end of the shank 11 is the longitudinally extending, hollow, cylindrical cup 18 having the internal flange 19 on its inward end which closely surrounds the shank 11 inwardly of the head 12. A helical expanding spring 20 is circumposed on the shank 11 and is compressed between the cup flange 19 and a retainer ring 21 circumposed on the shank, the spring being held under adjusted compression by an adjusting nut 22, backed up by a lock nut 23, both nuts being threaded on the portion 14 of the shank 11. The annular edge 24 of the cup flange 19 surrounds the shank 11 with sufficient looseness to permit some tilting of the cup 18, as well as longitudinal movement of the cup 18 relative to the shank 11.

The outward end of the cup 18 is outwardly tapered or conical, as indicated at 25, and provided at the apex with an axial, outwardly projecting shank portion 26 having a ball 27 on the outward end. The ball 27 turns freely in all directions in a ball socket 28 formed in the inward end of a cylindrical block 29. The control rod 9 is rigidly connected to project radially from the block 29.

When endwise movement is imparted to the control rod 9 in either direction crosswise of the shank, the resultant endwise stress imposed on the cup 18 through the ball 27 and shank portion 26 causes gradually increasing sidewise tilting of the cup 18 relative to the shank 11, and correspondingly increasing resistance of the spring 20. When compression of the spring 20 has progressed to a certain degree, further tilting of the cup 18 relative to the shank 11 is relinquished in favor of sidewise movement of the cup 18 and shank 11 together and the transmission of this concerted movement to the carburetor throttle lever 8,

whereby the throttle lever is swung toward an open or a closed position, depending upon the direction of endwise movement of the control rod 9. In this action, the spring 20 cushions and graduates the actuation of the throttle lever and causes the cup 18 and the shank 11 to gradually resume their normal axial relationship as the control rod movement is halted.

I claim:

In a flexible joint, a cylindrical shank having a lateral annular shoulder on one end thereof, a cylindrical cup having a closed end and an open end, said one end of the shank and its shoulder entering the open end of the cup and being positioned within the cup in relatively greatly axially spaced relation to the closed end of the cup whereby substantial endwise movement of the shank within the cup is provided for, an internal annular flange on the open end of the cup with whose axially inward side said annular shoulder is engageable whereby axially outward movement of the shank from the cup is prevented, the annular shoulder on the shank being sufficiently

smaller in diameter than the interior of the cup to permit lateral swinging of the shank relative to the cup and its internal flange, a helical spring circumposed on said shank axially outwardly of the open end of the cup, retaining means on said shank spaced axially outwardly from the closed end of the cup and serving to compress said spring between itself and the open end of the cup whereby the annular shoulder on the shank is normally yieldably engaged with the internal flange on the open end of the cup with the shank in axial alignment with the cup.

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