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RECIPROCATING MECHANISMS

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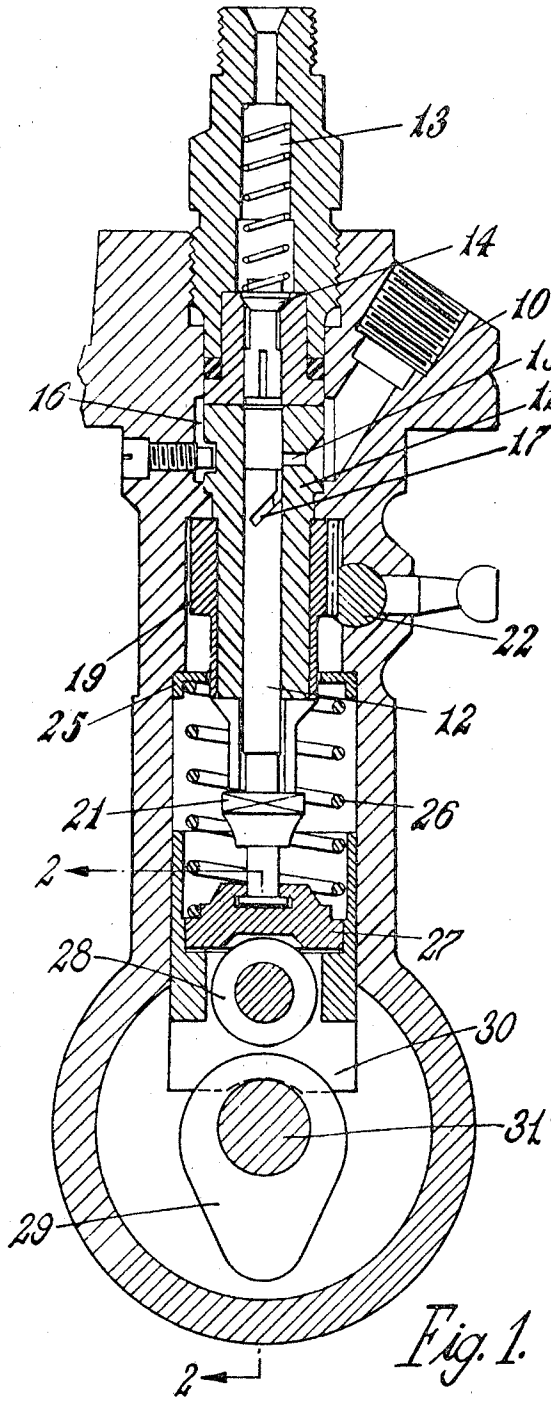


Fig. 1.

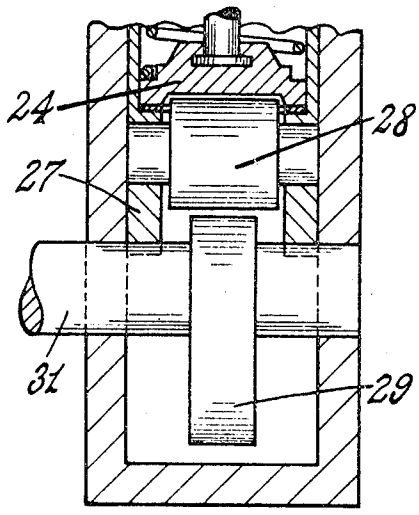


Fig. 2.

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RECIPROCATING MECHANISMS

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ABSTRACT OF THE DISCLOSURE

A reciprocating mechanism including a tappet which carries a roller, a cam for imparting movement to the tappet and the tappet being provided with flank portions which extend adjacent the side faces of the cam thereby to prevent angular movement of the tappet.

This invention relates to reciprocating mechanisms of the kind comprising in combination, a tappet and a rotary cam for imparting movement to the tappet, the tappet incorporating a roller which bears upon the surface of the cam.

The object of the invention is to provide such a mechanism in a simple and convenient form.

According to the invention in a mechanism of the kind specified the tappet is provided with flank portions disposed on opposite sides thereof and which can bear against the opposite side surfaces respectively of the cam to prevent angular movement of the tappet.

In the accompanying drawings:

FIG. 1 is a sectional side elevation of one example of a fuel injection pump incorporating the invention,

FIG. 2 is a section on the line 2—2 of FIG. 1.

One example of a reciprocating mechanism in accordance with the invention will now be described as applied to a tappet and cam combination such as is found in a fuel injection pump for supplying fuel to an internal combustion engine.

At the inner end of the bore is an outlet **13** incorporating a spring loaded non return delivery valve **14** and adapted for connection to an injection nozzle associated with an engine cylinder. Moreover, intermediate the ends of the bore is an inlet port **15** in communication with an annular recess **16** in the body part and to which fuel is fed by a feed pump or other convenient means. The inlet port **15** is so positioned in the bore that it will be uncovered by the inner end of the plunger **12** when the latter is at the outward limit of its travel thus allowing fuel to enter the pumping chamber from the annular recess **16**. During the inward movement of the plunger the inlet port **15** will be covered and fuel will be delivered to the outlet **13** and hence to the engine cylinder by way of the delivery valve **14**. In the periphery of the plunger and extending from its inner end is a helical groove **17** which as the plunger is moved inwardly, and after the inlet port **15** has been covered by the end of the plunger, reopens the port to spill any fuel remaining in the pumping chamber to the annular recess **16** at the same time terminating the delivery of fuel to the engine cylinder. The angular setting of the plunger **12** relative to

the barrel **11** thus determines the point during the inward movement of the plunger when fuel is spilled.

Surrounding the portion of the barrel remote from the outlet is a hollow sleeve **19** having a pair of longitudinal slots **20** extending inwardly from the outer end and engaging with radial lugs **21** on the plunger. The arrangement is such that longitudinal movement imparted to the plunger will not be transmitted to the sleeve whereas angular movement of the latter will be imparted to the plunger.

Formed on the outer periphery of the sleeve **19** are teeth which engage with a toothed fuel control rod **22** mounted for axial movement transversely relative to the plunger axis, in the body part.

On the outer end of the plunger is a spring abutment collar **24** between which and a washer **25** bearing on an internal shoulder in the body part is a coiled compression spring **26** which urges the plunger outwardly. The collar **24** is located within a cam follower **27** having a roller **28** adapted to coact with a cam **29** rotatable by the engine with which the pump is associated.

With this construction it is essential that the tappet or cam follower **27** should not move angularly within the body part **10** and it has been the practice to provide a groove in the peripheral surface of the follower and to provide a peg or similar member in the body part which co-operates with the groove to prevent angular movement of the tappet. Such an arrangement has however a number of disadvantages which the arrangement to be described overcomes.

The peg and the associated groove are omitted and the follower **27** is provided with flank portions **30** which extends downwardly beyond the roller **28** on opposite sides of the cam **29**. Moreover, the ffank portions extend circumferentially about the shaft **31** supporting the cam on opposite sides of the centre line as defined by the axis of the plunger **12**. Moreover, the radius of the shaft **31** is smaller than the minimum radius of the cam **29** so that the latter has continuous side surfaces. The aforesaid flank portions **30** of the follower co-operate with the side surfaces of the cam to prevent angular movement of the follower.

Conveniently and as shown, the minimum radius of the cam **29** is so chosen that the end faces of the aforesaid flank portions **30** bear upon the shaft **31** when the plunger is at its outermost position. In this manner the roller is removed from the cam surface and more efficient lubrication of the co-operating surfaces of the cam and roller and the co-operating surfaces of the roller and follower can be effected.

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

1. A reciprocating mechanism comprising in combination, a hollow body part, a cylindrical bore mounted in the body part, a cylindrical tappet slidable within said bore, a rotary shaft mounted within the body part, a roller mounted on the tappet, a cam mounted upon the shaft and having side surfaces and a cam surface with which the roller co-operates to effect movement of the tappet, flank portions disposed on opposite sides of the tappet and which bear against the opposite side surfaces respectively of the cam to prevent angular movement of the tappet.

2. A mechanism as claimed in claim 1 in which said flank portions bear upon said shaft to remove said roller from the cam surface during the dwell period of the cam thereby to facilitate lubrication of the co-operating surfaces of the cam and roller and the roller and tappet.

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