

METHOD FOR CONTROLLING LIFT OF ENGINE VALVES

IITM Technology Available for Licensing

PROBLEM STATEMENT

- Generally, it is noted that the changing the opening & closing times and lifts of the valves at various operating speeds can enhance the fuel efficiency & reduced emission.
- Based on prior arts discussion, several means of controlling the timing and lift of valves have been proposed, however the IC engines are very limited due to **difficulties in manufacturing, assembly, size constraints & cost.**
- Further, said prior art actuation mechanism are **limited to external or active means.**
- Hence there is a need to address above issues.

TECHNOLOGY CATEGORY/ MARKET

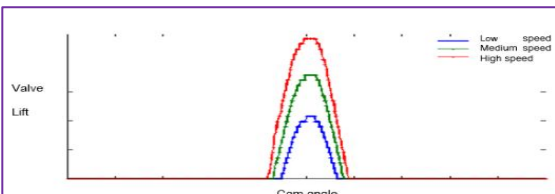
Technology: valve operating mechanism;

Industry: Automotive, **Applications:** Engines, Energy;

Market: The global control valves market is projected to grow at a **CAGR of 6.6%** during 2021 to **2027**;

TECHNOLOGY & EXPERIMENTAL IMAGE

- The present invention describes a **valve operating mechanism** for **varying the length** of a valve stem of the valve.
- The valve operating mechanism comprises:
 - a **valve**;
 - a **telescopically extendable valve stem**,
 - a **cam**,
 - a **camshaft** for rotating said cam about an axis,
 - a **centrifugal governor** fitted over the camshaft & actuated by angular velocity of the camshaft,
 - a **lever means** actuated by said centrifugal governor cam shaft speed,
 - a **link means** associated operably with lever means to correspondingly actuate the telescopically extendable valve stem.



Prototype's experiment data is shown in graph.

- Said mechanism characterized in the arrangement that the **extension length** of valve stem is a **function of cam shaft speed.** (Refer Fig.1)
- The **lever means** is connected to the **valve stem** with a **pin**, wherein the pin is mounted on a **rotatable collar**, thereby allowing relative rotation between the two telescoping parts of the valve.

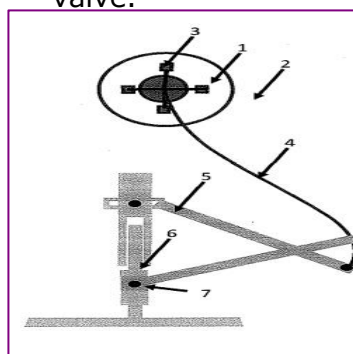


FIG.1a: Illustrates the claimed Valve operating mechanism.

- 1- camshaft,
- 2-centrifugal governor
- 4- link means
- 5- lever means
- 6- Valve stem
- 7- rotatable collar

KEY FEATURES / VALUE PROPOSITION

- ❖ **Technical Perspective:** Modification in the valve stem configures the valve operating mechanism **extensible** during operation, which facilitates **said product** to be **used** by the **auto company.**
- ❖ **Industrial Perspective:** Enhanced Fuel efficiency & emission norms have been **steadily narrowed**, which fulfils the industry demand.

INTELLECTUAL PROPERTY

IITM IDF Ref. 1285; Patent No: 349087

TRL (TECHNOLOGY READINESS LEVEL)

TRL- 3/4, Proof of Concept ready, validated

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