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FLYWHEEL ROTATION DEVICE

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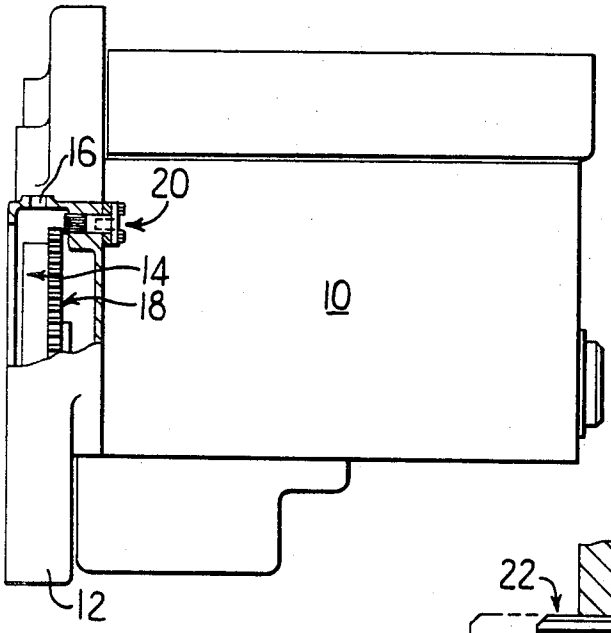


FIG. 1.

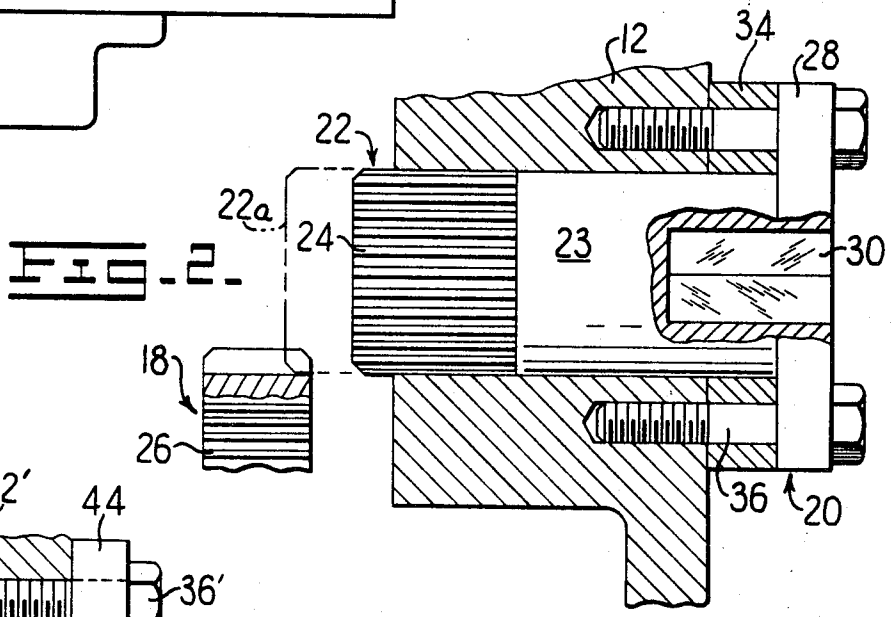


FIG. 2.

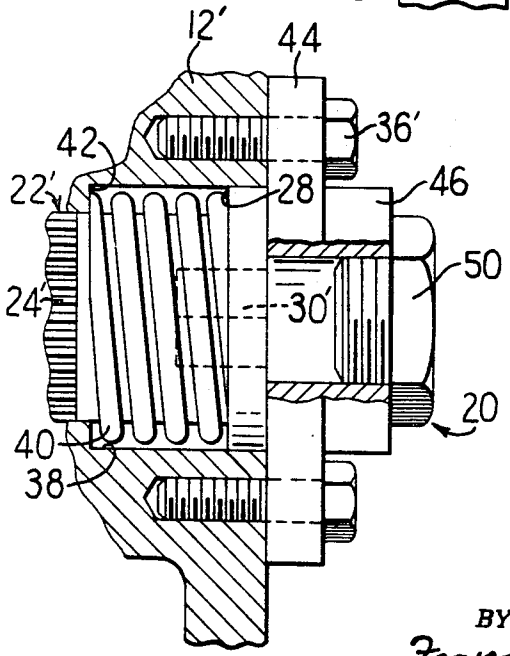


FIG. 3.

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FLYWHEEL ROTATION DEVICE

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ABSTRACT OF THE DISCLOSURE

A flywheel rotation device having a pinion movable into engagement with a ring gear associated with an engine flywheel, the pinion being manually rotatable to produce rotation of the flywheel for engine timing purposes.

The present invention relates to a device for the rotation of an engine flywheel for timing purposes.

As is well known in the art, it is often necessary to time the components of an engine for the proper functioning thereof. The timing operation is usually carried out following the repair or replacement of an engine component such as, e.g., a gear, fuel pump, piston or balancer. In order to time the engine, it has been the practice in the prior art to manually rotate the engine flywheel. However, such practice has presented serious disadvantages. Also it has often been difficult to gain access to the engine to be timed because of space limitations.

Another disadvantage is that it has been difficult to produce the desired rotation, because of the high compression pressures and weight of the engine components which must be turned. To facilitate the rotation of the flywheel, it has been a common practice to employ a pry bar for engaging the teeth of the ring gear usually associated with the flywheel. However, the use of such a pry bar permits movement through the space of only a few gear teeth at a time. In addition, the pry bar which is usually inserted through an opening in the flywheel housing, often causes damage to the latter.

The force required for manual flywheel rotation has, in the prior art, often been reduced by use of a compression release mechanism such as will reduce the piston compression pressures by maintaining the respectively associated exhaust valves in open position. The use of such a compression release mechanism, however, represents an added element of cost for the engine timing operation. As a further element of cost, it has often been necessary to employ two men for such timing operation. Thus, one man may rotate the flywheel while the other man may observe the usual timing marks on the flywheel or manipulate the timing pin often used.

The present invention provides a flywheel rotation device which overcomes the above-discussed problems of the prior art. The advantages of the present invention will become apparent to one skilled in the art, from the following description when read in conjunction with the accompanying drawings in which:

FIG. 1 is a schematic side elevational view being partly in cross section of an engine housing equipped with the flywheel rotation device of the invention;

FIG. 2 is an enlarged medial cross sectional view of the rotation device of FIG. 1; and

FIG. 3 is a view similar to FIG. 2 illustrating a modified form of the invention.

In FIG. 1, there is shown an internal combustion engine **10** of conventional type. A housing **12** for a flywheel **14** is provided with a conventional timing hole **16**. Mounted for rotation with the flywheel **14** is a ring gear **18** of conventional design.

Mounted in association with the housing **12** is a flywheel rotation device **20** constructed in accordance with the invention. The device **20** (see also FIG. 2) provides a pinion **22**. The pinion **22** is formed as a part of a shaft **23** and its teeth **24** are engageable with teeth **26** of the ring gear **18**.

The pinion has a flange **28** at its rearward end and a socket **30** for reception of a tool by means of which it may be rotated.

The pinion is mounted for rotation and reciprocation in the wall of housing **12**. A spacer **34** is disposed between the flange **28** and the housing and all are secured in place as by capscrews **36**.

When it is desired to rotate the flywheel **14** for engine timing purposes, the capscrews **36** are removed and the pinion is withdrawn for removal of the spacer **34**. The pinion is then reinserted into the position indicated at **22***a* to mesh with the ring gear. A suitable tool (into shown) is then inserted in the socket **30** to rotate the pinion. Rotation of the ring gear and flywheel is thus effected. The timing hole **16** is then employed for observation of conventional timing marks which appear on the flywheel. The timing hole **16**, may, alternatively, be used for the insertion of a conventional timing pin into a suitable bore provided in the flywheel. The invention provides a comparatively easy means for rotation of the flywheel for timing purposes. The invention assures ready access to the flywheel even where there is a serious space limitation.

The invention enables more rapid rotation of the flywheel than has been possible in the prior art. At the same time, the necessity of the use of a pry bar is eliminated.

It also serves to provide a mechanical advantage despite serious space limitations which also serves to eliminate the necessity of employing a compression release mechanism.

The invention is of comparatively low cost and its use permits the conducting of a timing operation by a single man.

In FIG. 3, there is shown a modified form of the invention. Here a flywheel rotation device is shown which is associated with a flywheel housing **12'**. A pinion **22'** has teeth **24'** and a flange **28'**. A counterbore **38** in the housing receives the flange **28'**. Encircling the pinion **22'** is a spring **40** which at its outer end bears against the flange **28'** and at its inner end against a shoulder **42** of the counterbore **38**. With this construction, the spring **40** tends to retain the pinion in its retracted or inoperative position. A plate **44**, retained in place by capscrews **36'**, holds the parts in the position illustrated. The plate **44** has an extension **46** of a diameter which will fit within the counterbore **38** and also has a central opening with a closure stud **50**. In order to cause engagement of the pinion with the ring gear capscrews **36'** are removed, the stud **50** is removed and the plate **44** is reversed so that the extension **46** engages the shoulder **28'** moving it inwardly against the force of spring **40** and thus also moving the pinion **24'** inwardly and into engagement with the ring gear. With the ring gear thus engaged, a suitable tool may be inserted in a socket shown at **30'** for timing the engine.

We claim:

1. A device for rotating an engine flywheel, comprising:

(a) a pinion adapted to engaged a ring gear mounted on said flywheel, said pinion being adapted for manual rotation when in engagement with said gear; and

(b) means mounting said pinion for movement between an operative position of engagement with said gear and an inoperative position of disengagement from said gear.

2. A device in accordance with claim 1, in which said pinion is of elongate, cylindrical shape.

3. A device in accordance with claim 2, in which said pinion is provided with a socket adapted to receive a tool for the purposes of said manual rotation.

4. A device in accordance with claim 1, in which said mounting means provide a bore adapted to receive said pinion for said movement between operative and inoperative positions.

5. A device in accordance with claim 4, in which said bore is formed in a housing for said flywheel.

6. A device in accordance with claim 1, in which said mounting means are adapted to maintain said pinion normally in said inoperative position.

7. A device in accordance with claim 6, in which said pinion is formed with a shoulder, said mounting means being adapted to engage said shoulder for maintaining said pinion in said inoperative position.

8. A device in accordance with claim 7, in which said mounting means include a spacer member for engaging said shoulder.

9. A device in accordance with claim 7, in which said mounting means include a spring for engaging said shoulder.

10. A device in accordance with claim 9, in which said mounting means include a retaining member having a flat side and a side with a projection, said retaining member being adapted for positioning with said flat side in engagement with said shoulder when said pinion is in said inoperative position, said retaining member being adapted for positioning of said projection in engagement with said shoulder, for movement of said pinion into said operative position.

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