F. L. UNGER.

CAM GEAR.

APPLICATION FILED AUG. 26, 1914.

1,228,265.

Patented May 29, 1917.

2 SHEETS—SHEET 1.

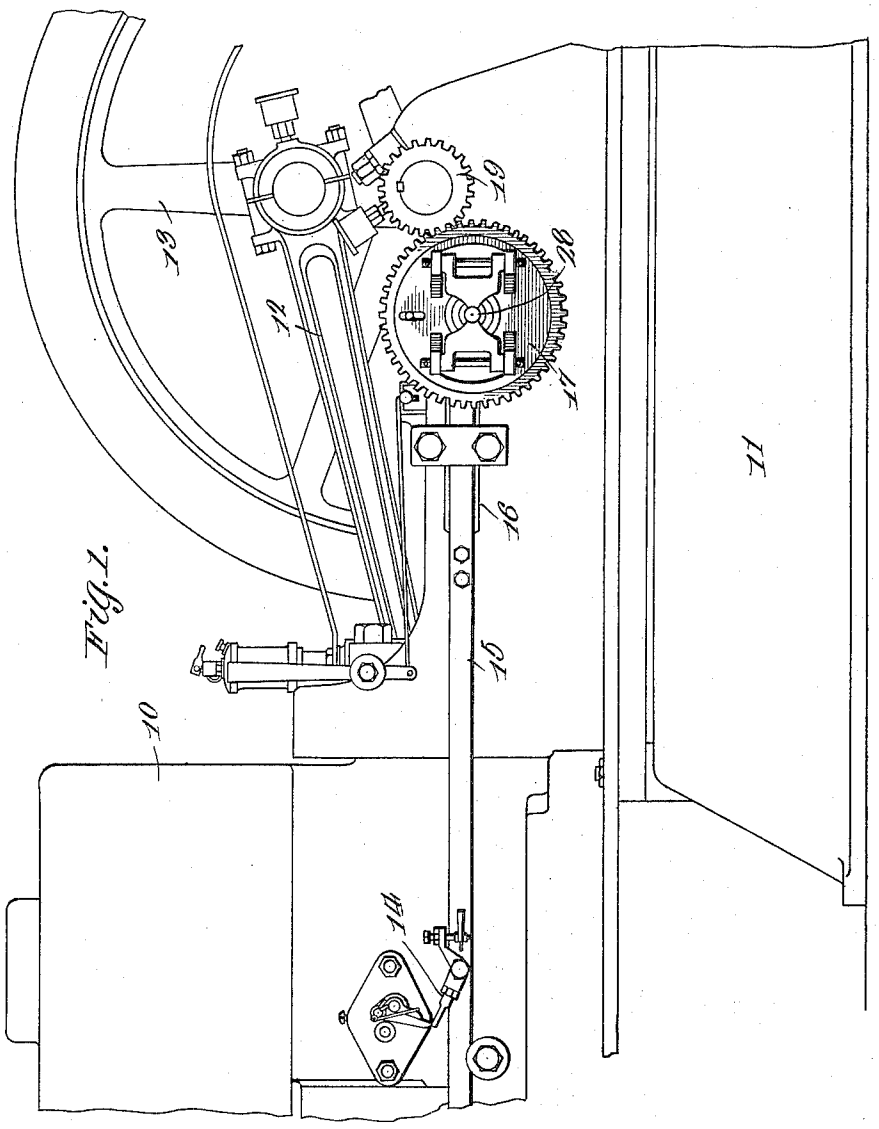


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

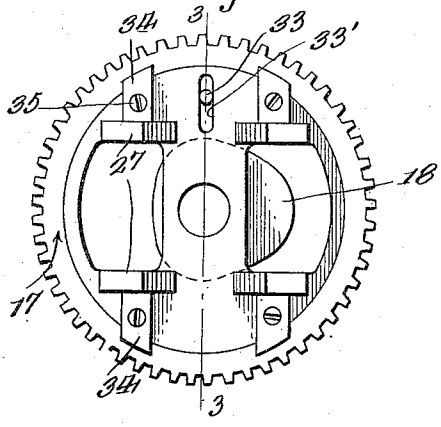


Fig. 4.

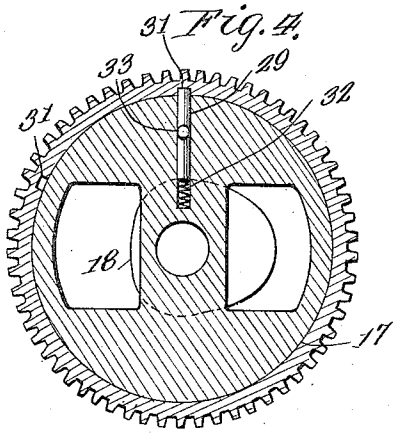


Fig. 3.

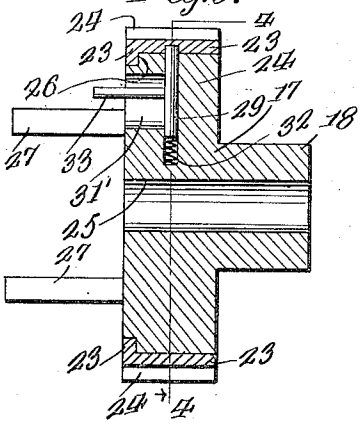


Fig. 5.

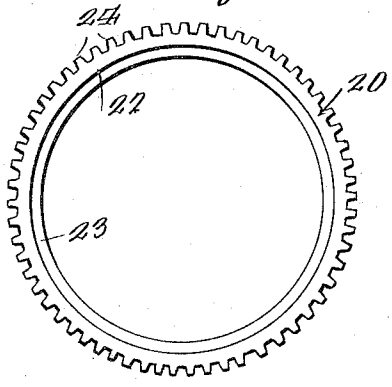
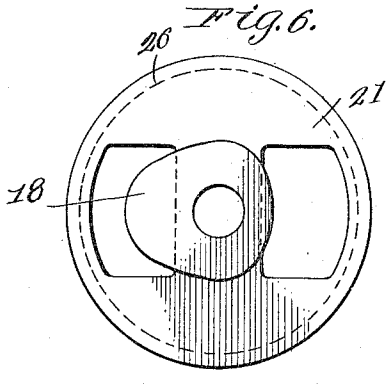


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CAM-GEAR.

1,228,265. Specification of Letters Patent. Patented May 29, 1917.

Application filed August 26, 1914. Serial No. 858,723.

To all whom it may concern:

Be it known that I, FRANK L. UNGER, citizen of the United States, residing at New Prague, in the county of Scott and State of Minnesota, have invented certain new and useful Improvements in Cam-Gears, of which the following is a specification.

This invention relates to replaceable gears, and more particularly relates to means permitting ready replacement of such gears as are operated upon gasolene or other engines to actuate the spark controlling cam shaft.

As a principal object, this invention contemplates the provision of a two-part gear wheel, one of which parts is formed with gear teeth of any usual construction and the other of said parts being provided with an integral cam, said parts being removably and adjustably connected.

A further object is the provision of replaceable cam gear which is so constructed as to permit a shifting of the cam with relation to the gear teeth so that the sparking point will be accordingly manipulated to reverse the engine.

An object of equal importance with the foregoing is to so construct a two-part cam gear, each of which parts may be separately replaceable and to provide relative cam shifting means with such a gear by using the minimum number of parts and so constructing the latter that they shall be cheaply manufactured and durable and efficient in operation.

The above and additional objects are accomplished by such means as are illustrated in the accompanying drawings, described in the following specification and then more particularly pointed out in the claims which are appended hereto and form a part of this application.

With reference to the drawings, wherein I have illustrated the preferred embodiment of my invention, as it is reduced to practice, and throughout the several views of which like characters of reference designate similar parts,

Figure 1 is a side elevation of a stationary gasolene engine provided with a cam gear of the type comprehended by this invention,

Fig. 2 is an enlarged elevation of the gear itself removed from its engine emplacement,

Fig. 3 is a vertical section taken upon the planes indicated by the lines 3—3 of Fig. 2,

Fig. 4 is a sectional view taken at right angles to Fig. 3, on the line 4—4 of that figure,

Fig. 5 is a detail elevation of one of the component parts of this invention as it would appear when being replaced, and

Fig. 6 is a similar view of the other component part under corresponding circumstances.

There is illustrated in Fig. 1, an improved type of gasolene engine of the stationary variety such as is generally adapted for the performance of heavy work upon a farm. Before proceeding further with the description of the manner in which the invention herein to be disclosed is adapted for use with such an engine, it may be well to emphasize the fact that although this present cam gear has been designed with particular reference to the needs of such stationary engines, has been illustrated and will hereinafter be described in that connection, that it is, nevertheless, equally applicable to any type of prime mover in which a transmission gear is also desired to actuate a cam shaft.

In Fig. 1, the numeral 10 designates a gasolene engine mounted upon a foundation plate 11 and equipped as is customary with a pitman 12 operatively connected to the fly wheel 13, and the sparking point attachment 14, which latter is mounted upon a cam rod 15 provided with a cam strap 16. The cam gear 17 as provided by this invention, is adapted to be positioned as shown in this figure, with the strap 16 connected to the cam 18 carried by this gear, the gear itself being adapted to be driven by a second gear 19 mounted upon the axle of the fly wheel so that rotation of this gear 17 will obviously cause oscillation of the cam rod 15 and consequently result in a break and make contact with the sparking mechanism 14. The gear is illustrated as an entirety in Figs. 2, 3 and 4 and may be seen to be composed of the parts further illustrated separately in Figs. 5 and 6, such component parts including the toothed member 20, and a cam bearing member 21.

The member 20 comprises mainly an an-

nular rim 22 and is formed upon one side with the peripheral flange 23 and is further formed with a suitable number of ordinary gear teeth 24 upon its outer circumference while the member 21 is bored as at 25 to accommodate a supporting shaft and is annularly grooved as indicated at 26 to receive the flange 23 of the member 20 when the two parts are united to form the gear 17. An integral cam extension 18 previously referred to is formed upon the member 21 at the medial portion of its inner face as particularly illustrated in Figs. 3 and 6. Suitable stirrups 27 are also carried by the portion 21 in order to replaceably support said member at the extremity of its supporting shaft 28.

As a means for preventing circumferential displacement of the member 20 upon the member 21 within the former when rotated by means of its connecting gear 19, there has been provided the yieldable plunger 29 working in a suitable recess 30 formed in the member 21 and designed to coact with spaced recesses 31 provided in the abutting portion of the rim 23. A suitable expansible coiled spring 32 is interposed between the plunger and the inner wall of the recess 30 in order to normally and resiliently hold the plunger 29 in either of the recesses 31 as may be determined by the user of the machine. Manually operable means 33 are provided for controlling the movement of the spring-pressed plunger and consists mainly of a stem fixed to the plunger 29 and extending laterally through a slot 33′ connected with the plunger recess 30 so that it may be grasped exteriorly by the person desiring to operate the same. Removable straps 34 may be also secured as at 35 by any desirable and quickly removable means to the body of the member 21, such straps extending beyond the circumference of the cam member and abutting the peripheral flange 23 of the toothed member so as to prevent lateral displacement of the members relative to each other.

The operation of the described construction of cam gears in order to attain the previously presented objects is as follows:

The gear is properly positioned upon its shaft 28 in operative connection with the actuating gear 19 and with the cam shaft straps 16 and ordinarily acts in the manner already set forth. Should however the gear teeth become damaged such as is often done by the eccentric strain furnished by the rapidly moving cam shaft, it is possible by merely removing the straps 34 and depressing the manually controllable plunger 29 to entirely remove the part 20 without affecting the position of the member 21 so that a new toothed member 20 may be substituted for the broken or damaged piece. It may be here stated that it is also contemplated and is adjudged to be within the province of this invention to provide in addition to the already described connection of a cam gear, means for forming the toothed member 20 from two separable rim sections so that should the lateral displacement of this member upon the member 21 be impossible, the separable rim sections will still permit of the removal of the toothed member.

When it is desired to reverse the action of the engine, all that becomes necessary is to depress the plunger 29 and rotate the inner cam member until the plunger is received by the other recess 31 formed in the inner member of the toothed member 20 which is held fixed during this movement by its connection with the gear 19. Such rotation of course, changes the position of the cam and consequently sets forward the next action of the spark so that the explosion in the next combustion chamber will not take place after the dead center of the piston is reached but immediately before, the effect being of course to reverse the action of the piston. It will accordingly be seen that a cam gear as constructed and as set forth in the foregoing, will be readily capable of attaining the previously presented objects and that accordingly this invention may be claimed as possessing the advantages and desirability to be found in such objects.

While in the foregoing however, there has thus been illustrated in the drawings and described in the specification such combination and arrangement of elements as constitute the preferred embodiment of this invention, it is desired to emphasize the fact that such minor changes in the matters of proportion and degree may be made in later adaptations of this device, as shall not alter the spirit of the invention as defined in the appended claims.

What is claimed, is:

1. A cam gear comprising a circular hub portion having a circumferential groove in its peripheral edge, and a cam formed centrally on one side thereof, a rim having notches therein adapted to embrace said grooved portion and provided with peripheral gear teeth, said rim having an inwardly directed flange thereon engaging said groove, and manually operable means slidable in said hub portion and engaging one of said notches in the rim portion to maintain said rim portion in position and permit a designed displacement thereof.

2. A cam gear comprising a circular hub portion having a circumferential groove in its peripheral edge, and a cam formed centrally on the side of said grooved portion, an annular rim adapted to embrace said grooved portion, and an inwardly directed flange thereon engaging said groove, remov-

able means for preventing the lateral displacement of the two portions, and a slide lock between the two portions to permit shifting of the cam relatively to the rim without disturbing said first-named means.

3. A cam gear comprising a circular hub portion having a peripheral groove at one side and an integral cam portion formed centrally of said hub portion and on one face of the same, an annular rim adapted to surround said hub portion provided with peripheral gear teeth and an inwardly projecting flange on one side thereof to enter said peripheral groove, and manually operated sliding connection carried by said hub portion to hold said rim normally against movement and permit a designed displacement thereof in rotative direction.

4. A cam gear comprising a circular hub portion having a peripheral groove at one side and an integral cam portion formed centrally thereof and on one face of the same, an annular rim having a plurality of notches therein adapted to surround said hub portion provided with peripheral gear teeth and an inwardly projecting flange on one side thereof to engage said peripheral groove, removable straps fastened on the hub portion and projecting over the rim portion to prevent lateral displacement of the rim in one direction, and a sliding spring pin carried by the hub portion engageable in one of a plurality of notches in the rim portion to lock the two portions in fixed relation and also to permit a determined rotatable adjustment between the two parts.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK L. UNGER.

Witnesses:
JOSEPH B. MAERTZ,
NORBERT H. SCHREINER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."