

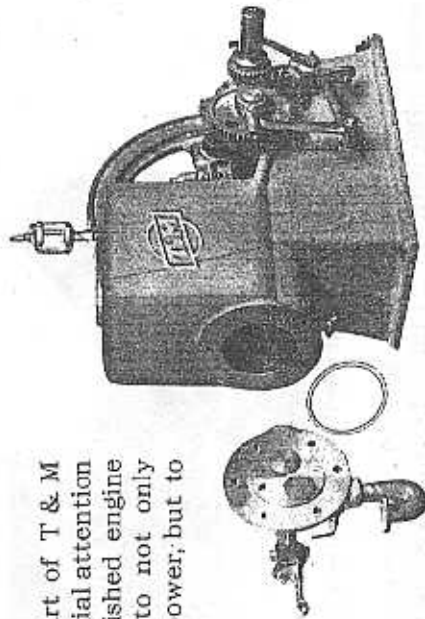
Every detailed part of T & M engines is given special attention in order that a finished engine may be produced to not only develop the rated power, but to operate along continuously without trouble of any kind whatever.

Note that the main bearings are set at an angle so that all of the piston thrust will be taken entirely by the heavy cast base, so that no pressure or force is exerted upon the cap. This is an important feature in the life of an engine.

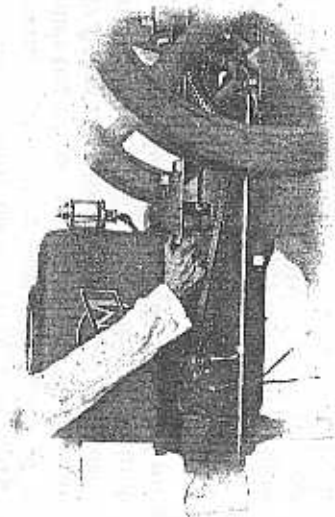
The governor being of the hit and miss type, the *governor hooks* must be very carefully made and adjusted. These are made of high grade special steel and properly hardened to prevent wear.

The matter of cylinder head packing has been carefully worked out by us, and as now constructed it is practically impossible for a cylinder head to leak. This saves an annoyance which is of frequent occurrence on most engines now in use. Our packing gasket is composed of a combination of copper ring and asbestos, the copper preventing the asbestos from being blown out, thereby preventing any "leaky heads."

The speed of T & M engines can be changed while running, to a limited degree. This makes it convenient for special classes of work where different speeds are necessary without shutting the engine down to change speed.



Note Copper Asbestos Gasket



Changing Speed while Running



Fig. 527

Connecting Rod of Small Engines

The crank shaft of the T & M engine is turned from solid, high grade carbon steel of the best quality, and ground to size by special machinery. Large wearing surfaces are provided, and liberal dimensions given the cranks to insure strength.

The connecting rods are well proportioned, to give lightness and strength, the smaller sizes being semi-steel and the large sizes cast steel. All are made interchangeable, same as other component parts.

Particular attention is given to balancing the flywheel to prevent vibration. Balance weights cast in the rim are fitted opposite the crank pin. Mathematical calculations, followed by experimental tests, as shown herewith, make sure the balance weights are properly proportioned.



Fig. 528

Connecting Rod of Large Engines

The pulley is fitted to the engine shaft by key and set screws, so it can be easily removed for changing to different sizes. All engines are shipped with straightface pulley for shifting belt unless otherwise specially ordered. Friction clutch pulleys of desired size can be attached to any of our engines at small extra cost if so ordered.

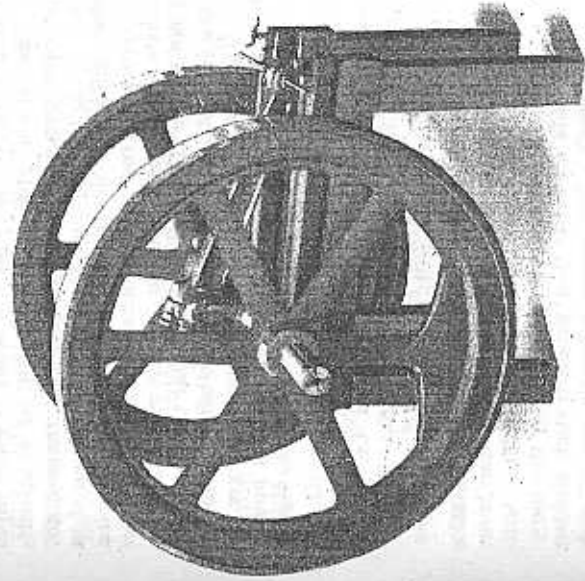


Fig. 529 Method of Balancing Flywheels

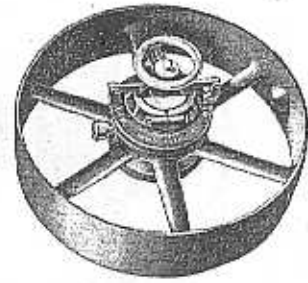


Fig. 530

Friction Clutch Pulley

T & M engines are equipped with jump spark ignition on engines up to and including 4 h. p. The 6 h. p. and above have the T & M make and break ignition. The jump spark is better for small engines, because of the higher speed; while the make and break is the best for the larger, slow speed engines. Besides this, the make and break spark plug, to be efficient, and obviate short circuit troubles, must be of such large dimensions as to be out of proportion for small cylinders. We have adopted this dual system after a long experience with both types of ignition; and it has given universal satisfaction.

Our original design of make and break ignition gives a much better spark than the ordinary type, because of the *genuine hammer break* effect resulting from the entire separation of the hammer lever and the movable electrode. It also has many novel features not found in other makes.

The contact points are made of special alloy to aid in producing a good spark. The most important feature which acts to give a hot spark is the velocity of the break at the points. We claim in this igniter that the break is more rapid than any other type of igniter. The cut herewith shows the method of operating: (c) is the movable electrode with contact lug (a) forming part thereof; (b) is the insulated stationary electrode; (d) the hammer lever, which is pivoted at (g). (h) is a spring for holding the hammer lever against the tappet (c), keeping contact points apart; (e) is a reciprocating rod which forces the hammer lever away from the tappet, this rod rests on an eccentric collar (j); this collar is movable on a stud (k) by means of the handle (f) by which the collar is thrown up or down as desired; a beveled trip (l) is attached to the rod (e) which raises the rod (c) when it strikes the collar (j), raising the rod above the hammer lever (d) allowing it to fly back and strike the tappet (c) separating the contact points. By movement of the lever (f) the spark is advanced or retarded at will.

NOTE THAT THE HAMMER LEVER IS INDEPENDENT OF THE MOVABLE ELECTRODE

This insures that no break can take place at the points until the hammer lever strikes the tappet (c). No igniter with the hammer lever mounted on the movable electrode can produce such sudden break. This means a hot "fat spark" with no ignition trouble.

This igniter is the outcome of years of experience with all types.

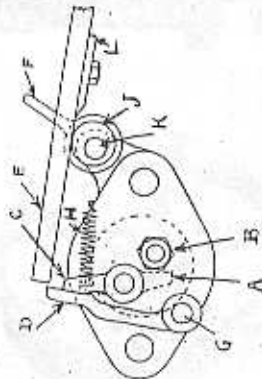


Fig. 532

Drawing Showing Action of T & M Igniter

The make and break igniter is so designed that when the governor "hooks up" and holds the exhaust valve open, the actuating lever *F* is lifted above the lever *D*, so no spark can occur until the valve operation again takes place. This saves batteries and wear of parts. The time of ignition can be changed while running, by lever *F*.



Fig. 533

Jump Spark Magneto

The jump spark igniter used on our smaller engines (because of high speed) is very simple. The spark plug is screwed into the cylinder head and can easily be removed for cleaning. Batteries and jump spark coil are furnished. The coil is different from the make and break coil. The jump spark coil has a vibrator, or "buzzer" attached, which causes the spark to jump across the plug points when the contact on the engine is made. The contact maker on the $2\frac{1}{2}$ and 4 h. p. sizes can be varied while the engine is running; on the 1 h. p. and $1\frac{1}{2}$ h. p. it is set permanently, as adjustment while running on these small sizes is not required.

Magnetos are supplied when desired, the make and break magneto being mounted on the engine frame and gear-driven while the jump spark magnetos are set on the skids or floor and the magneto driven by a friction governor pulley from the flywheel, the regular jump spark coil being used. The engine can be started on batteries, then switched on the magneto, which feeds the current through the the same jump spark coil.

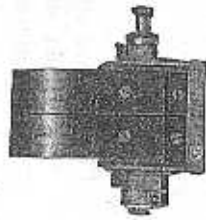


Fig. 534

Make and Break Magneto

I agree that the T & M is one of the smoothest running engines on the market. They are giving perfect satisfaction in every way.

B. ROSENDOM, Redkey, Cal.