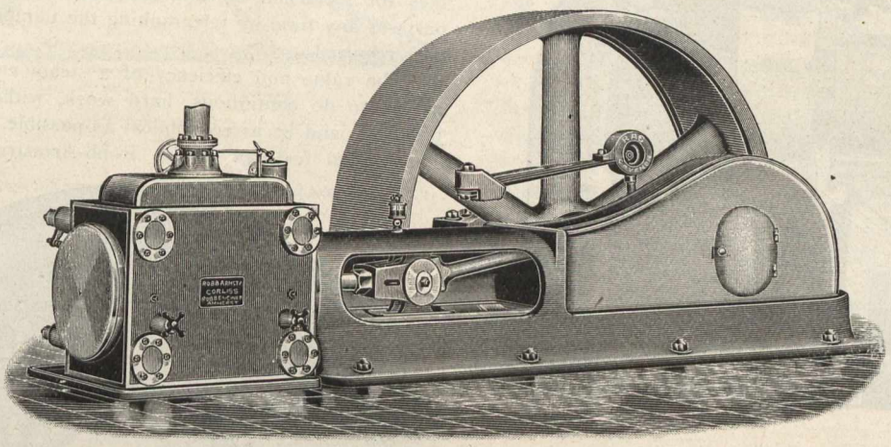
and as there are only about half as many pieces and wearing surfaces, and no latches or detachable parts, the gear runs very smoothly without noise or friction. The valves are of the usual Corliss rotative type, triple ported, of the latest design, giving very short travel and quick opening. The exhaust valves are driven from a wrist plate in the usual way.

The automatic cut-off is obtained by means of a shaft governor, located in the driving wheel of the engine, so arranged that the position of the eccentric is varied, changing the cut-off of the valves directly. This method of governing is much more positive, quicker in action and gives a closer regulation than the indirect method of governing used in connection with the releasing valve gear.

with various types of governors can properly appreciate the ease and certainty with which the necessary adjustments are made on this one, and the absolute integrity with which they are maintained. No other governor compares with it in these all essential qualities.

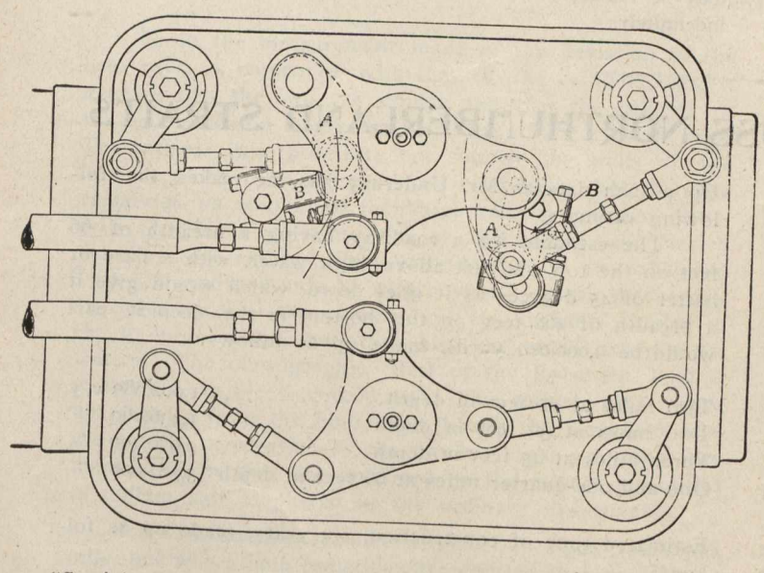
The crank shaft is made of the best quality of mild, forged steel and the crank disk of semi-steel or steel casting. The shaft is forced into the disk by hydraulic pressure, and as an extra precaution, a key is inserted between the shaft and disk. The crank pin is large in diameter in proportion to length, so that centre of thrust is as close as possible to the shaft bearing; hence, springing of the crank is minimized. The journals of the crank shaft and crank pin are carefully

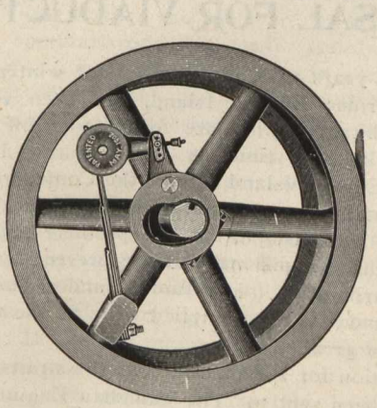


In the Robb-Armstrong-Sweet governor, the centrifugal weight is carried directly by the spring, so that the heavy strain, due to centrifugal force, is not brought on the suspension pin, which merely carries the eccentric, and is not subject to any strain or friction, except that due to the driving of the valve gear. The centrifugal weight may be very heavy without bringing undue strain on the spring, because a large part of its centrifugal force is carried by end pull on a flat lead spring, so that inertia of the weight will be sufficient to prevent disturbance by the reciprocating motion of the valve gear, and the weight is so placed that it gets the effect of inertia for quick regulation. The governor system is in gravity balance in all positions, because the eccentric is made to balance the centrifugal weight, the principle of balancing being the same as that invented by Professor John E. Sweet, and used in the

ground to gauge, and lapped to perfect surface. The crank pin is oiled continuously by the waste oil from the shaft bearing, and also from the sight feed valve on the main bearing cap, the oil being caught in an annular recess at the back of the crank disk and conveyed to the crank pin, by centrifugal force, through the oil hole shown in the sectional cut of the main bearing and crank.

The shaft bearings consist of interchangeable, removable shells lined with genuine babbitt, made of pure copper, tin and antimony compressed into the outer cast-iron shells and carefully bored and scraped to gauge. The shells are in halves, turned on the outside to fit seats in the frame of the engine, held to place and adjustable by wedges, as shown in the illustration. The adjustment is made by screws from the outside of the cap; by loosening the centre screws which hold the top wedge, and tightening the side screws, which lift the side wedges and close in the shell, or, vice versa. The adjustment of the shells may be made by hand while the engine is running, which enables the engineer to feel the tightness, and prevents



"Straight Line" governor. The result is an extremely simple and powerful governor, in which there is not enough friction to prevent it from changing position almost instantly to meet sudden changes of load, and there is no possibility of racing when properly adjusted. By means of a simple adjustment of the link connecting the eccentric and centrifugal weight, the governor weight may be adjusted to any degree of sensitiveness or close regulation. Only an engineer who has had experience

getting the bearing too tight. By this arrangement, the shell is closed in evenly all around, keeping the contact of the bearing surfaces even and equal as wear takes place, which is not the case in the ordinary four-part box. As the strain on the bearing is on the bottom and sides only, the top part of the shell is open and does not touch the shaft, which prevents heating, and allows the oil to be well distributed over bearing. The bearing shells are interchangeable, and may be replaced at any time without delay, restoring the alignment of the