March 20, 1928.

1,663,144

A. D. SKINNER

ENGINE

Filed Aug. 4, 1921

3 Sheets-Sheet 1

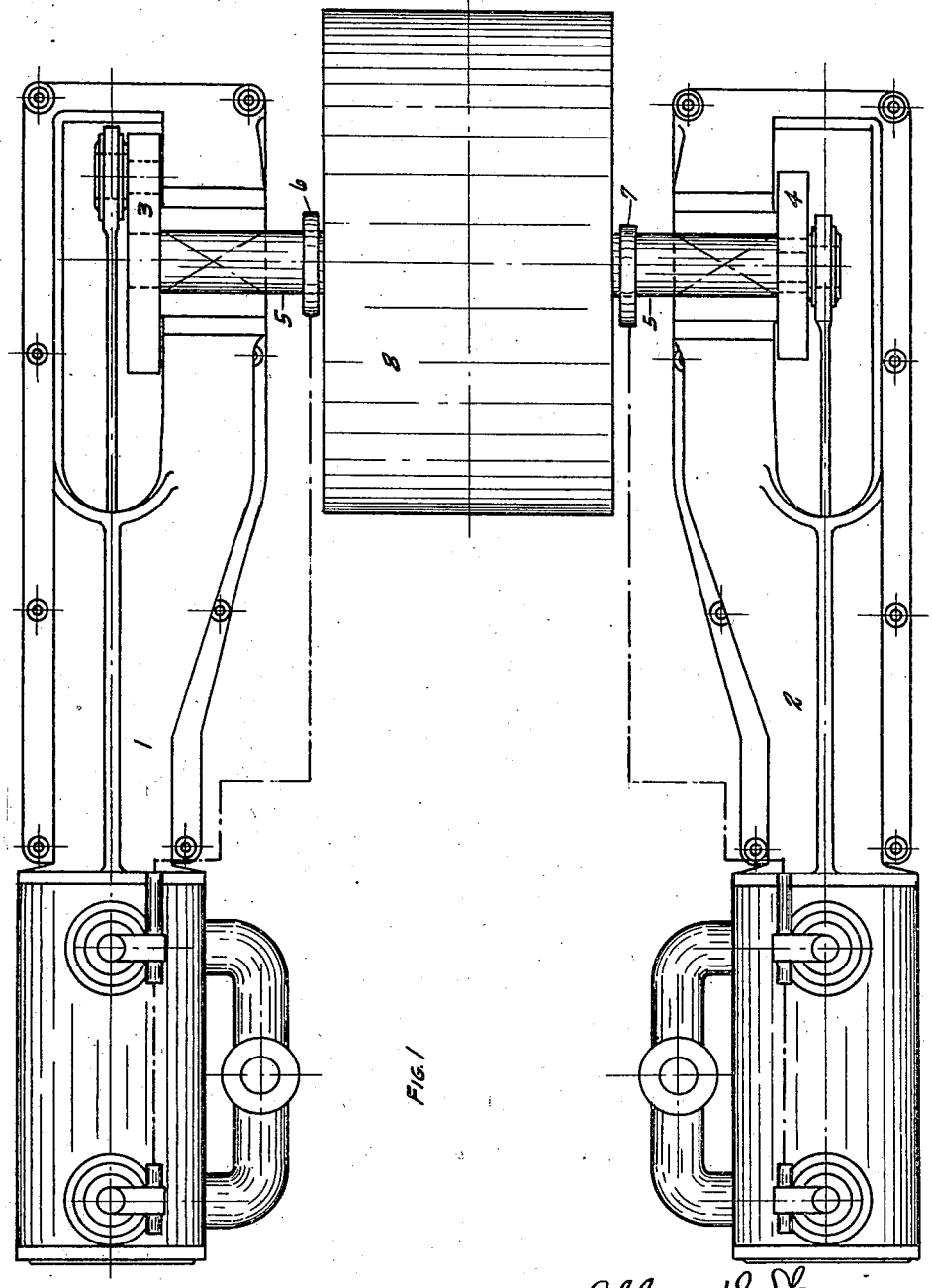

FIG. 1

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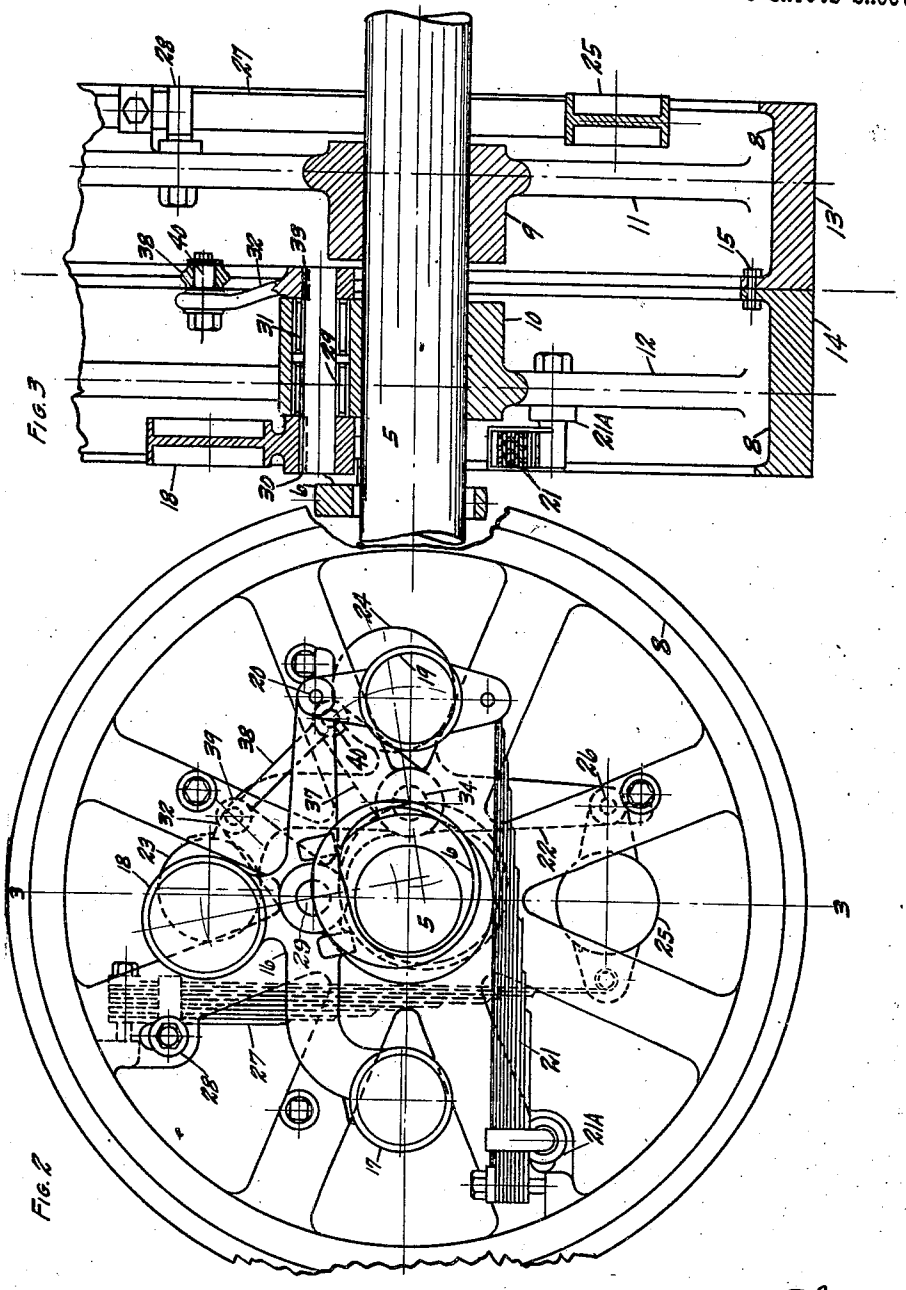

FIG. 3

FIG. 2

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March 20, 1928. 1,663,144

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ENGINE

Filed Aug. 4, 1921 3 Sheets-Sheet 3

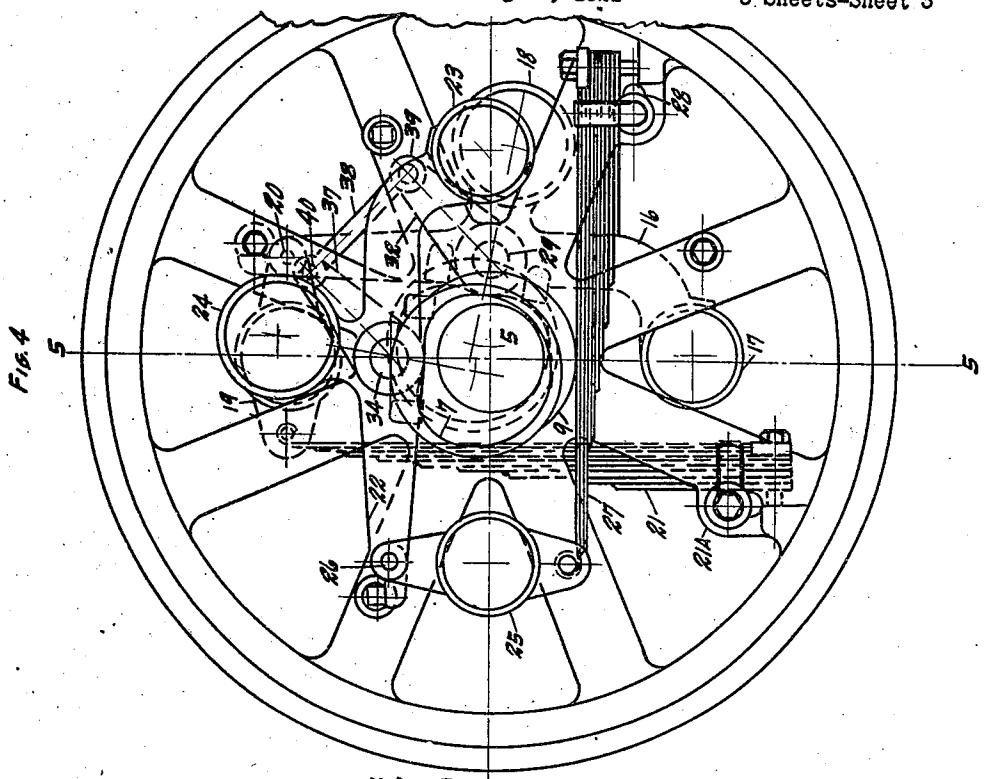

FIG. 4

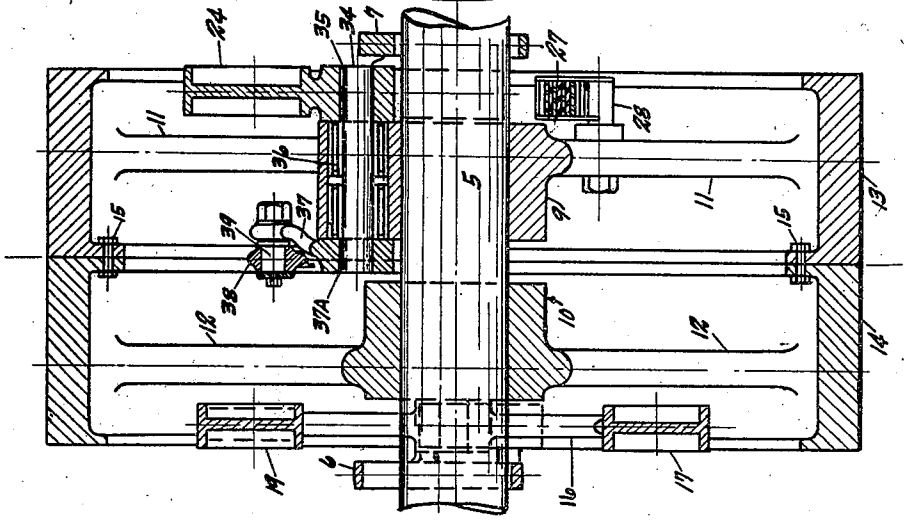

FIG. 5

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UNITED STATES PATENT OFFICE.

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ENGINE.

Application filed August 4, 1921. Serial No. 489,727.

This invention relates to a governor which will control a double engine so that both engines will deliver a uniform effort in the same crank shaft. In the present invention two governors are utilized each supplying the governing force for each engine and these governors are connected so that they are compelled to give uniform responses to the control valve gears and consequently uniform performance of the engine. The only added frictional disturbance to the two governors is the slight friction which may be incident to the lack of uniformity in the operation of the two governors. I prefer to provide governors which are interchangeable and which can be readily mounted on a carrier provided with double sets of spokes, the connecting mechanism being arranged between these spokes. Other details will appear from the specification and claims.

The invention is illustrated in the accompanying drawings as follows:—

Fig. 1 shows a plan view of an engine.

Fig. 2 a side elevation of one of the governors.

Fig. 3 a section on the line 3—3 in Fig. 2.

Fig. 4 a side elevation of the companion governor.

Fig. 5 a section on the line 5—5 in Fig. 4.

1 and 2 mark the engines operating upon cranks 3 and 4 respectively, these cranks being mounted upon a common shaft 5. The engines 1 and 2 are controlled from eccentrics 6 and 7 respectively mounted on a carrier 8 which in the ordinary practice is also the drive pulley of the engine. The carrier is formed in halves with the hubs 9 and 10 providing two lines of spokes 11 and 12 carrying the rim portions 13 and 14, the two halves being secured together by bolts 15. The eccentric 6 is rigidly mounted on a governor arm 16. The governor arm is provided with the weights 17 and 18 formed rigidly with the arm and the weight 19 pivotally secured to the arm at 20. A spring 21 resists the action of the weights, the spring being mounted on a fulcrum bracket 21^a on the carrier 8. The eccentric 7 is rigidly mounted on a governor arm 22, this arm being provided with the weights 23 and 24 fixed on the arm and the weight 25 pivotally connected at 26 with the arm. A spring 27 mounted on the bracket 28 resists the action of the weights, the bracket 28 being mounted on the carrier. These governors are of substantially the same construction as shown in the patent to Le Grand Skinner #628,591, July 11, 1899.

The arm 16 is mounted on a shaft 29 and is fixed against rotation thereon by a key 30. The shaft is mounted in the roller bearing 31 arranged in the hub of the carrier. A rock arm 32 is keyed to the inner end of the shaft by a key 33. The arm 22 is fixed on a shaft 34 by means of a key 35. The shaft 34 is mounted in a roller bearing 36 arranged in the hub of the carrier and a rock arm 37 is fixed on the inner end of the shaft by means of a key 37^a. A link 38 connects the rock arms 32 and 37, the rock arms being provided with the pins 39 and 40 for this purpose.

It will be noted that both governor structures are exactly the same, in fact, they are interchangeable, the only difference being that the side toward the carrier in each governor is reversed so that the governor arms may have the same relation to the direction of rotation. It will also be observed that if the governors are perfectly synchronized there will be no frictional loss through the connecting link whatever and that the only loss is what is necessary to compel uniform action. By mounting the governors on the carrier, particularly a carrier of the double spoke type which is common with this type of engine, the connecting mechanism may be arranged between the lines of spokes and is thus conveniently located. A connection of this sort where the carrier is divided is more satisfactory than a shaft connection through the two parts of the carrier as it is very difficult to get such alinement of such a connection through the parts as it is necessary to give the governor very slight clearance and still have a minimum of friction. The device is particularly applicable to governors operating on quarters and these governors may be swung to follow the crank arrangement without complicating the means of connection.

What I claim as new is:—

1. In an engine, the combination of a crank shaft; two cranks on the shaft; two eccentrics, one eccentric having operative relation with one crank and the other eccentric having operative relation with the other crank; a carrier for the eccentrics; two governors, one for each eccentric, each governor comprising a weighted arm on which an ec-

centric is rigidly mounted, a shaft on which the arm is fixed, and bearings for the shafts in the carrier; and connections between the shafts compelling equal responses by the eccentrics, said connections being at the opposite sides of the bearings from the governor arms.

2. In an engine, the combination of a crank shaft; two cranks on the shaft; two eccentrics, one eccentric having operative relation with one crank and the other eccentric having operative relation with the other crank; a carrier for the eccentrics; two governors, one for each eccentric, each governor comprising a weighted arm on which an eccentric is rigidly mounted, a shaft on which the arm is fixed, and bearings for the shafts in the carrier; and connections between the shafts compelling equal responses by the eccentrics, said connections being at the opposite sides of the bearings from the governor arms and comprising rock arms on said shafts; and a link between the rock arms.

3. In an engine, the combination of a crank shaft; two cranks on the shaft; two eccentrics, one eccentric having operative relation with one crank and the other eccentric having operative relation with the other crank; a carrier for the eccentrics mounted on the crank shaft and having two lines of spokes, said eccentrics being mounted on the outer sides of said spokes; governor mechanisms mounted on the carrier actuating the eccentrics, shafts carrying said eccentrics and extending to a position between the lines of spokes; and a connection arranged between the lines of spokes connecting the shafts.

4. In an engine, the combination of a crank shaft; two cranks on the shaft; two eccentrics, one eccentric having operative relation with one crank and the other eccentric having operative relation with the other crank; a carrier for the eccentrics mounted on the crank shaft and having two lines of spokes, said eccentrics being mounted on the outer sides of said spokes; shafts carrying said eccentrics and extending to a position between the lines of spokes; a connection arranged between the lines of spokes connecting the shafts; and a governor controlling said eccentrics.

5. In an engine, the combination of a crank shaft; two cranks on the shaft; two eccentrics, one eccentric having operative relation with one crank and the other eccentric having operative relation with the other crank; a carrier for the eccentrics mounted on the crank shaft and having two lines of spokes, said eccentrics being mounted on the outer sides of said spokes; shafts carrying said eccentrics and extending to a position between the lines of spokes; a connection arranged between the lines of spokes between the shafts; and a governor controlling said eccentrics, said governor being in dual form, one element being at each side of the carrier and each element carrying an eccentric.

In testimony whereof I have hereunto set my hand.

A. D. SKINNER.