G. D. ANGLE.

VARIABLE THROW CRANK SHAFT.

APPLICATION FILED FEB. 19, 1920.

1,385,768.

Patented July 26, 1921.

FIG. 1.

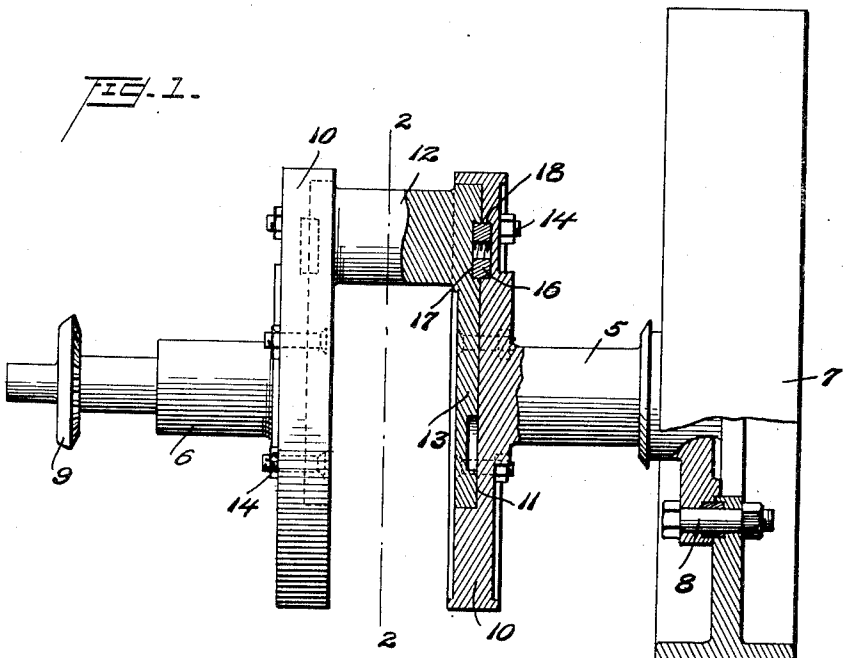


FIG. 2.

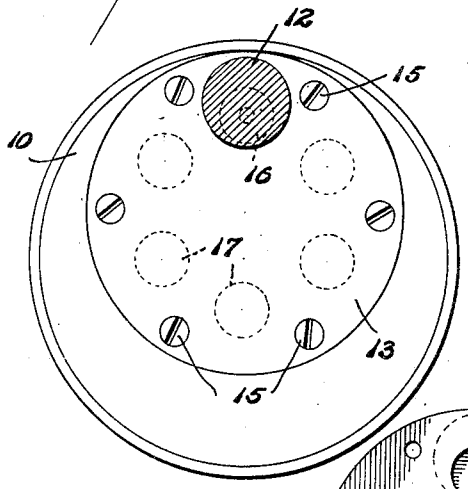
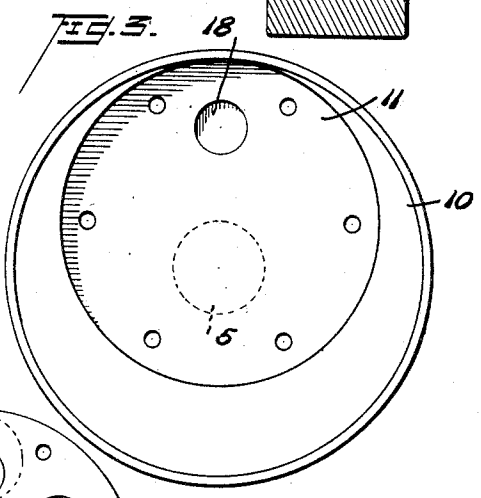


FIG. 3.



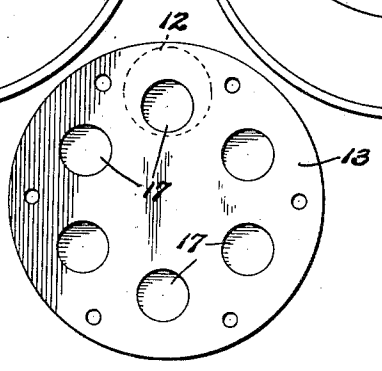


FIG. 4.

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UNITED STATES PATENT OFFICE.

GLENN D. ANGLE, OF DAYTON, OHIO.

VARIABLE-THROW CRANK-SHAFT.

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Application filed February 19, 1920. Serial No. 359,814.

To all whom it may concern:

Be it known that I, GLENN D. ANGLE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Variable-Throw Crank-Shafts, of which the following is a specification.

The present invention relates to crank-shafts for engines and consists in the combinations and arrangements of elements hereinafter described and particularly set forth in the accompanying claims.

The invention has for its purpose to provide an adjustable or variable crank-shaft for test engines whereby engine cylinders of various types and having different strokes may be operated for testing with a single crank-shaft thereby avoiding the necessity for having one size crank-shaft for each size of cylinder to be tested.

The invention has for its further purposes to produce a crank-shaft for use in connection with a universal one cylinder test engine which will eliminate the use of fittings or bearings otherwise required when different shafts are used; to permit of convenient and immediate change from one stroke to another when a different cylinder is to be tested; and wherein the use of the device will give an increased and beneficial fly-wheel action to a single cylinder engine.

The invention is shown by way of illustration in the accompanying drawings, wherein—

Figure 1 is a partial elevation and central sectional view thereof;

Fig. 2 a transverse section taken on the line 2—2 of Fig. 1;

Fig. 3 an elevational view of one of the shaft disk portions, and

Fig. 4 is a similar view of a crank pin disk portion.

Referring to the construction in further detail and wherein like reference characters designate corresponding parts in the different views shown, the structure consists of two coaxial shaft portions 5 and 6 provided respectively with an ordinary fly-wheel 7 detachably secured thereon by bolts 8, or other means, and having a gear wheel 9 for connection to be driven from the engine.

Each of the shaft sections 5 and 6 is provided with an integral disk portion 10 of suitable proportions and formed on one face with a recess or chamber 11 disposed eccentric with respect to the axis of the shaft, and said disk portions 10 are disposed to receive between them the intermediate or crank pin section, as shown.

The intermediate section comprises a crank pin 12 of the usual kind having formed thereon similar and integral disk portions 13 of the same dimensions as the recesses 11 and adapted to fit flush therein and have angular adjustment for varying the throw of said pin and thereby adapt the crank-shaft to the length of the engine cylinder to be tested.

The intermediate and end crank sections are connected together and the whole united into a unitary or single crank-shaft of the ordinary kind by the several bolts or screws 14 whose heads 15 are countersunk in the adjacent faces of the disk portion 13, thus giving a full clearance for the operation of the piston rod connection.

In the working of the crank-shaft the greatest strain to which the same is subjected would obviously be along the axis of the crank pin 12, and to withstand this there is provided a pair of dowels or blocks 16 located at either end of the crank pin 12 and fitting within corresponding recesses 17 and 18 formed in the disk portions 13 and 10 respectively of the crank-shaft sections. Each of the disk portions 13 is provided with a plurality of recesses 17 to receive the blocks 16 for the several angular adjustments of the crank-pin; and said blocks 16 are each apertured and screw threaded for the insertion therein of a suitably threaded tool to place and remove said blocks as will be understood.

It will, therefore, be seen from the foregoing that the crank-shaft may be universally used on a one cylinder test engine for testing the various strokes of different engine cylinders within standard limits, thereby avoiding the use of one crank-shaft for each type or size of cylinder as would otherwise be required; and it will be further noted that the coupled disk portions of the crank-shaft will operate to give an increased fly-wheel action in the working of the engine.

It is obvious that those skilled in the art may vary the details of construction and arrangement of parts without departing from the spirit of the invention, and it is therefore understood that the structure is not limited to such features except as may be required by the claims.

What I claim is:

1. In a variable throw crank shaft for engines, the combination of co-axial crank shaft sections having integral disk portions at their adjacent ends formed in their adjacent faces with eccentric recesses the diameter of which is greater than one-half the diameter of said disk portions, a crank pin having at its opposite ends eccentric disk portions of a size to fit flush into said eccentric recesses, the respective disk portions of the crank shaft sections and the crank pin having circular series of equally spaced bolt holes, and bolts insertible through said holes and the respective disk portions.

2. In a variable throw crank shaft for engines, the combination of co-axial crank shaft sections having integral disk portions at their adjacent ends formed in their adjacent faces with eccentric recesses the diameter of which is greater than one-half the diameter of said disk portions, a crank pin having at its opposite ends eccentric disk portions of a size to fit flush into said eccentric recesses, the respective disk portions of the crank shaft sections and the crank pin having circular series of equally spaced bolt holes and also having dowel cavities, dowels insertible in said cavities in line with the opposite ends of the crank pin, and bolts insertible through said holes and the respective disk portions.

In testimony whereof I have affixed my signature.

GLENN D. ANGLE.