P. M. VAN BOSCH.

PISTON ROD CONNECTION.

APPLICATION FILED DEC. 16, 1909.

974,935. **Patented Nov. 8, 1910.**

FIG. 1

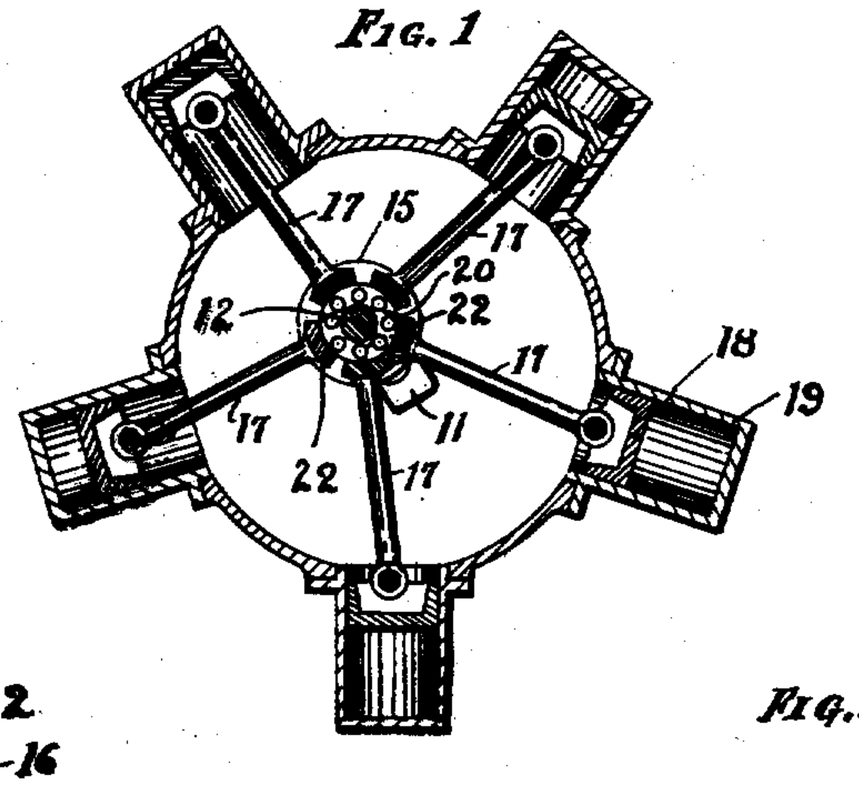


FIG. 2

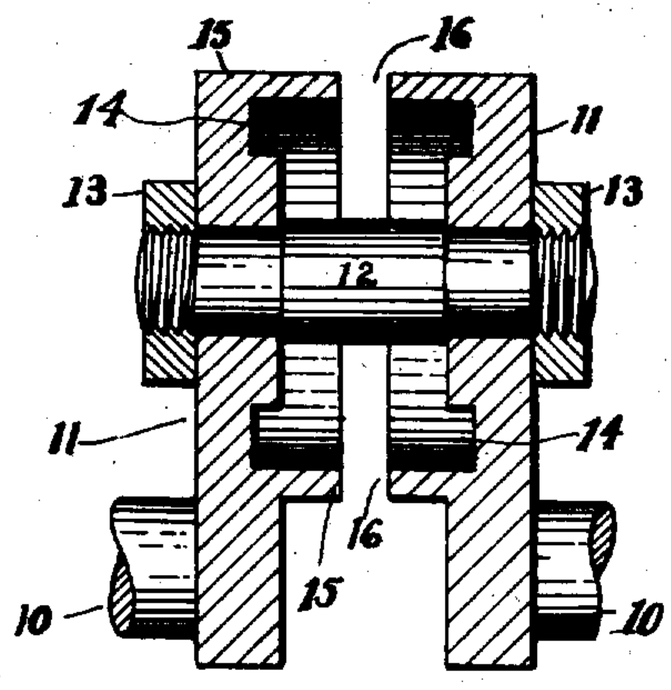
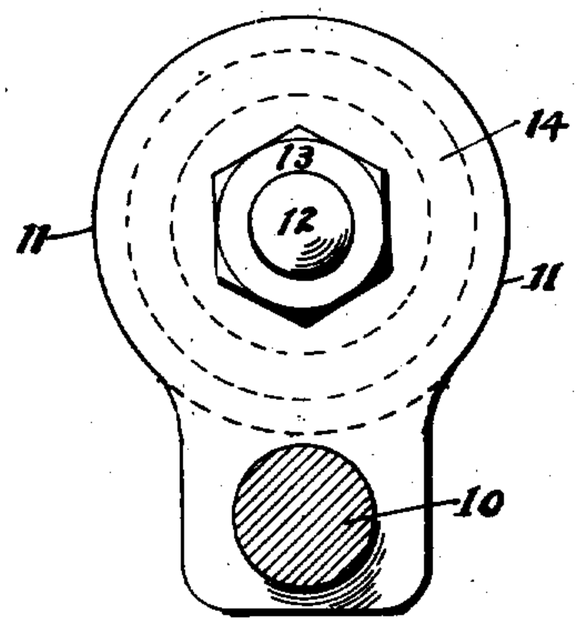


FIG. 3



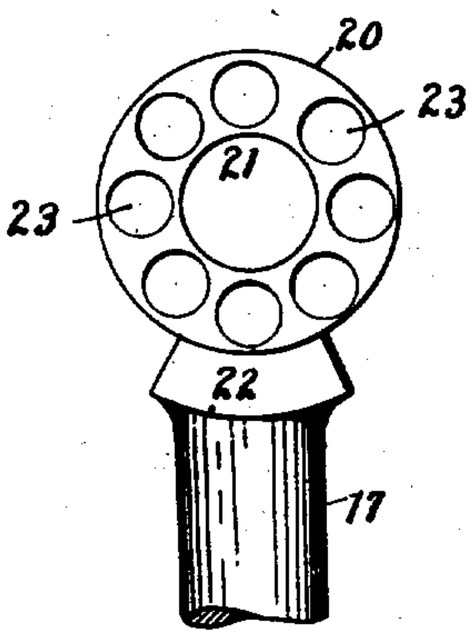


FIG. 4

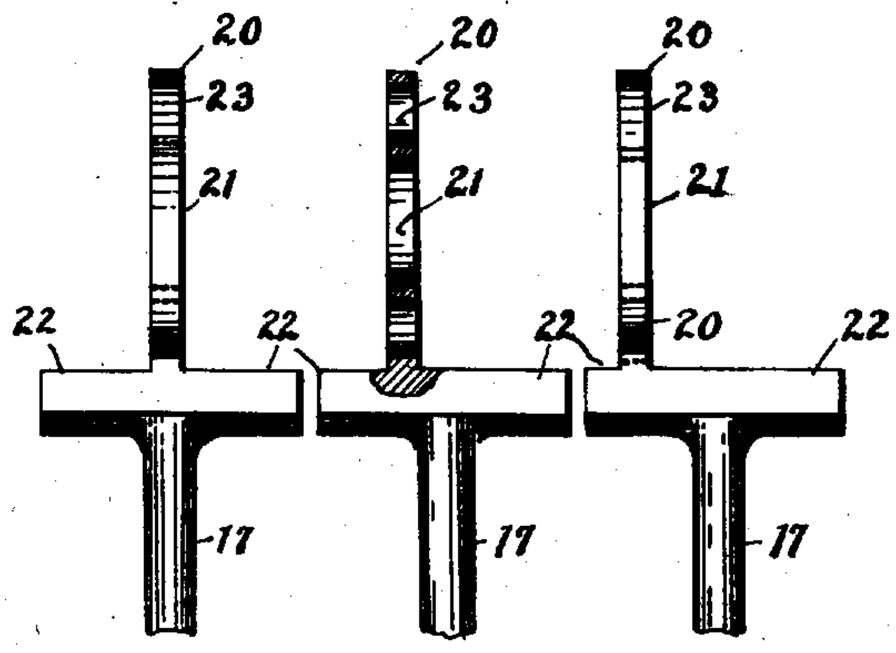


FIG. 5 FIG. 6 FIG. 7

Witnesses

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UNITED STATES PATENT OFFICE.

PETER M. VAN BOSCH, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO E. C. ECKER AND ONE-THIRD TO W. KABITZKE, OF CHICAGO, ILLINOIS.

PISTON-ROD CONNECTION.

974,935. Specification of Letters Patent. Patented Nov. 8, 1910.

Application filed December 16, 1909. Serial No. 533,321.

To all whom it may concern:

Be it known that I, PETER M. VAN BOSCH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Piston-Rod Connections, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to piston rod connections, and, particularly, to means for connecting piston rods to the crank shaft of engines, and consists substantially in the constructions and relative arrangements of parts, all as fully hereinafter set forth, and finally pointed out in the claims.

In the drawings, which illustrate practical embodiments of the various features of my invention, Figure 1 is a cross-sectional view of a five cylinder motor showing the application of my invention; Fig. 2 is a cross-sectional view through the crank-shaft, cranks, and crank-pin; Fig. 3 is a sectional view on the line 3—3 of Fig. 2; Fig. 4 is a side view of the lower portion of one of the connecting rods; Fig. 5 is an edge view of the lower portion of the central connecting rod; Fig. 6 is a similar view of the lower portion of one of the right or left inner connecting rods, and Fig. 7 is a similar view of the lower portion of one of the right or left outer connecting rods.

The parts or halves 10 of the crank-shaft, the cranks 11, and crank-pin or stub-bolt 12 are formed in substantially the manner shown, the crank-pin being removable in order to assemble the connecting-rods thereon and being held in place by any suitable means such as the set-nuts 13. The cranks 11 are provided on their inner faces with circular channels or grooves 14 concentric with the crank-pin 12, and the outer peripheries of these channels are extended toward each other as shown at 15 to form a central peripheral opening or space 16 in which the connecting rods are guided and travel.

Upon the pin 12 the connecting rods 17 are assembled. These rods are suitably connected to the pistons 18 of steam, fluid, or explosive motors, of either two or four cycle types, it being understood that the cylinders 19 thereof may be stationary or may revolve about the shaft. Each rod is preferably rectangular in cross-section and fits within the circumferential opening 16, and is provided at its inner end with a circular bearing-disk 20 revolubly fitting within the chamber of the cranks 11 and provided with an opening 21 to receive the crank-pin 12; each disk also has lateral wings or shoulders 22 adapted to travel in the channels 14. Each bearing-disk is also preferably provided with a plurality of small holes 23 acting as lubricant containers.

The central connecting rod illustrated in Fig. 5 has its disk 20 in the same vertical plane, while the disks of the other rods are offset as shown in Figs. 6 and 7, the disk shown in Fig. 6 being the inner one adapted to lie between the other two, and that shown in Fig. 7 being the outer disk; each of the parts shown in Figs. 6 and 7 may be reversed, by merely turning it over, so that it will act on either the right or left of the central disk. In using a five cylinder motor for example, such as indicated in Fig. 1, the central disk of Fig. 5 is used and two of each of the other disks of Figs. 6 and 7 are used, arranged in pairs, one pair on the right of the disk of Fig. 5 and one pair on its left; the crank-shaft is disassembled and the connecting rods are assembled thereon as follows; a left hand outer disk (Fig. 7) is fitted upon the left hand crank 11 with its left hand shoulder in the channel 14, a left hand inner disk (Fig. 6) is fitted against the outer disk with its left hand shoulder fitting in the channel 14, the central disk (Fig. 5) is fitted against the inner left hand disk with its shoulder in the channel 14, a right hand inner disk (Fig. 6 reversed or turned over) is fitted against the central disk with its left hand shoulder in the channel 14, a right hand outer disk (Fig. 7 reversed or turned over) is fitted against the right hand inner disk with its left hand shoulder in the channel, and the right hand half of the crank is then fitted on the last disk with the right hand shoulders of all the disks in its channel 14, the stud or pin 12 is inserted through the openings 21, and the halves of the crank are then bolted together by tightening the nuts 13 on the stud

12. This provides five connecting rods radiating at suitable distances apart to the cylinders, with the rods 17, by reason of the offsets of the disks, in the same line or plane; it is of course understood that the number of rods and associated disks may be varied and that by changing the proportions of the parts any number of cylinders from two up may be placed in the same plane and have their connecting rods in the same plane and in a direct line from the center of their pistons to the crank-pin. The shoulders of each disk bear on the channels 14 of the cranks and also on the rims or outer circumferences of all the other disks; this enables each connecting rod to have a bearing on the pin substantially equal to its entire working portion between the cranks and places stress of all the rods upon a uniform area.

Many changes on the relative sizes and arrangements of the disks and in other details of construction and arrangement may be made within the scope of my invention and without departing from it, and I do not wish therefore to be limited to the details or specific parts shown and described. Also, the mode of assembling the connecting rods and their bearing-disks on the crank-pin may be varied.

I claim:

1. A crank shaft and cranks having circular channels and a crank pin, a central disk on the pin having a connecting rod in the plane thereof, and lateral disks on the pin having offset connecting rods in the plane of the first rod, and shoulders on each disk bearing in the channels and upon the outer rims of the other disks.

2. A crank chamber having a circumferential passage and opposite channels, a crank-pin in the chamber, a central disk on the pin with its connecting rod passing through the said passage, a pair of complemental inner disks and a pair of complemental outer disks on the pin and having their connecting rods offset to pass through said passage, and shoulders on each disk bearing in the channels of the chamber and upon the outer rims of the other disks.

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

P. M. VAN BOSCH.

Witnesses:

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E. C. ECKER.