L. R. SPENCER.

APPARATUS FOR GAGING ENGINE PISTONS.

APPLICATION FILED OCT. 14, 1919.

1,375,237. Patented Apr. 19, 1921.

2 SHEETS—SHEET 1.

Fig. 2.

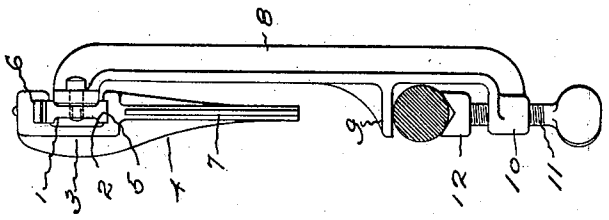
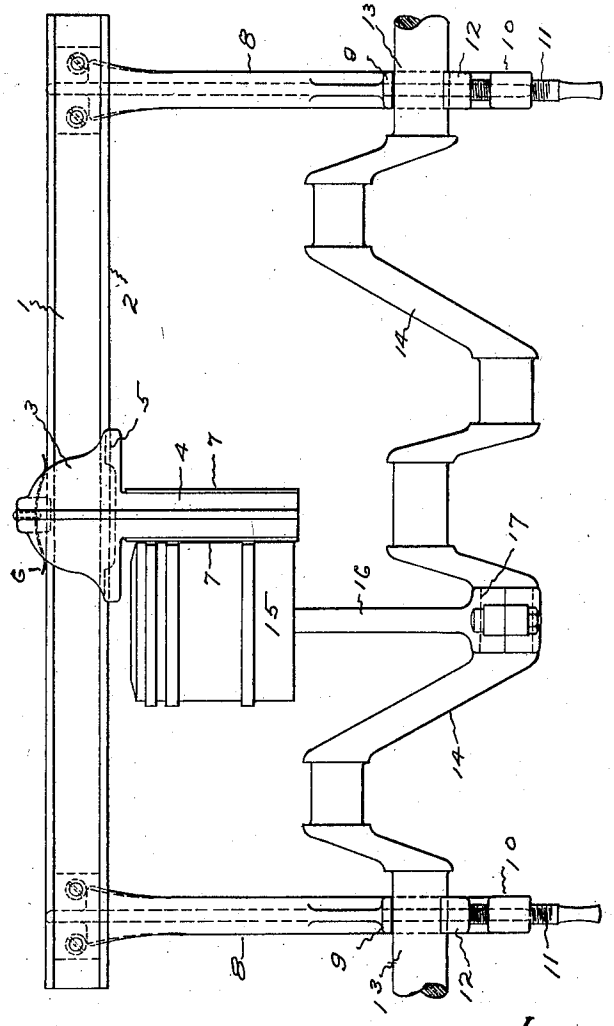


Fig. 1.



Inventor
Louis R. Spencer by
Harry R. Williams Atty.

L. R. SPENCER.

APPARATUS FOR GAGING ENGINE PISTONS.

APPLICATION FILED OCT. 14, 1919.

1,375,237.

Patented Apr. 19, 1921.

2 SHEETS—SHEET 2.

Fig. 4

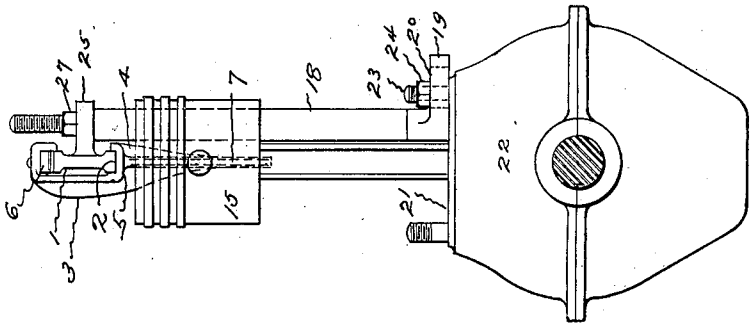
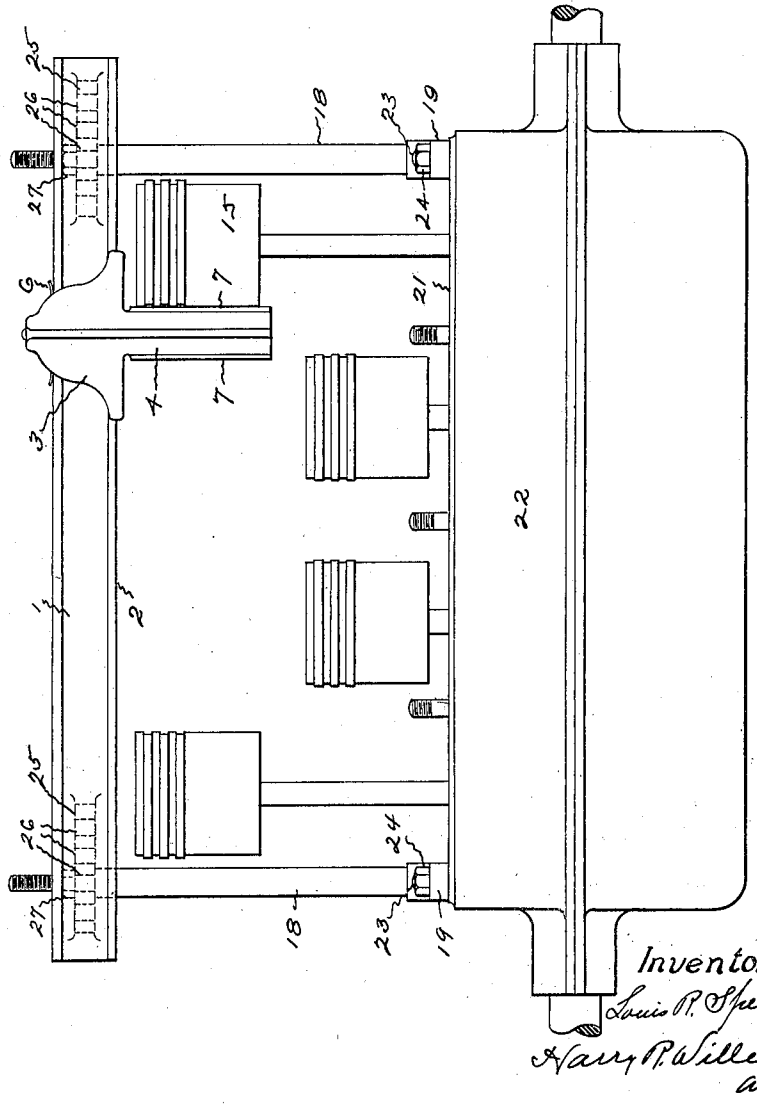


Fig. 3



Inventor
Louis R. Spencer
by
Harry P. Williams
atty.

UNITED STATES PATENT OFFICE.

LOUIS R. SPENCER, OF HARTFORD, CONNECTICUT.

APPARATUS FOR GAGING ENGINE-PISTONS.

1,375,237. Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed October 14, 1919. Serial No. 330,533.

To all whom it may concern:

Be it known that I, LOUIS R. SPENCER, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Apparatus for Gaging Engine-Pistons, of which the following is a specification.

The pistons of internal combustion engines are fitted closely to the bores of the cylinders in order to insure efficiency, consequently it is necessary that the axes of the pistons coincide with the axes of the cylinders. Frequently when setting up engines and particularly after they have been taken down for cleaning or repairs, it is found that the pistons do not aline perfectly with the cylinders, that is, the surfaces of the pistons are not parallel with the surfaces of the cylinders. This causes a binding of the pistons on one side at the top and on the opposite side at the bottom, which condition may result from uneven wear of the piston-rod bearings or from the springing of the piston-rods, and if not remedied produces excessive strains on the bearings, undue wear and scoring of the cylinder walls and piston surfaces and makes the engine run hard and with greatly reduced efficiency.

The object of this invention is to provide a simple apparatus by means of which the surface alinement of the piston set on the crank shaft of an internal combustion engine may be readily ascertained, so that if inaccurate the fault may be easily observed and quickly remedied by bending the piston-rods or scraping the bearings the necessary amount.

Figure 1 of the accompanying drawings shows a front elevation of a form of apparatus which embodies the invention illustrating its use in gaging a piston from the crank shaft on which it is set. In this form the gaging is accomplished from the shaft journals. Fig. 2 shows a side elevation of the same with the piston omitted. Fig. 3 shows a front elevation of a modified form of the apparatus illustrating its use when gaging pistons from the upper machined surface of the crank case. Fig. 4 shows a side elevation of the modified form in use.

The apparatus which forms the subject of this invention has a bar 1 with a straight edge 2. Movable back and forth on this bar is a head 3 with a depending gage arm 4. The head has a straight edge 5 which is held closely against the straight edge 2 on the bar by means of a spring 6 located in the top of the head and bearing on the top of the bar. The arm which depends from the head has two straight edges 7 which when the head is on the bar are at right angles to the straight edge 2.

Attached to the bar near each end is a leg 8. In the form first illustrated this leg near the bottom has a forwardly projecting bracket 9 and at the bottom has a forwardly extending foot 10. The foot has a threaded perforation turning in which is a thumb screw 11 with a block 12 swiveled on its upper end.

In using this form of the invention the brackets 9 are rested upon the upper side of the journals 13 of the crank shaft 14, and the blocks 12 are, by means of the thumb screws, set up against the under side of the crank shaft journals. When the apparatus is secured in this manner the straight edge on the bar is parallel with the axis of the shaft. The head is then moved along until one of the straight edges on the arm depending from the head comes into contact with the side of the piston 15. If the piston is out of true, as shown by the gage, the piston-rod 16 may be bent until the piston gages true, or the rod may be disconnected from the shaft and the bearings 17 scraped until the piston when remounted does gage true.

For gaging pistons already set in the crank case, as illustrated in Figs. 3 and 4, the bar, head and arm may have the same construction as already described. For use under these circumstances the legs 18 may be provided with outwardly extending feet 19 through which are slots 20. The under faces of these slotted feet are parallel with and equal distances from the straight edge of the bar and they are placed upon the top machined surface 21 of the crank case 22 over the crank case bolts 23, then nuts 24 are screwed upon the bolts to hold the structure rigid. If desired, ears 25 with several perforations 26 may be formed on the back of the bar for receiving the upper ends of the legs, and nuts 27 may be screwed on the upper threaded ends of the legs to secure the parts together. This permits the feet to be set over crank case bolts which are different distances apart.

When the apparatus is mounted in this manner the shaft is turned to elevate first

one piston and then the other, each piston being gaged and set when it is up.

This apparatus can be quickly attached to engine shafts or to crank cases and the alinement of pistons accurately insured so that they will fit into the cylinders without binding.

The invention claimed is:

1. An apparatus for gaging pistons comprising a bar with a straight edge, supporting legs depending from the bar, means at the ends of the legs for fixing them in position with the straight edge of the bar at right angles to the surface to be gaged, and a gaging arm with a straight edge extending at right angles to the straight edge on the bar, said arm being movable transversely back and forth toward and from said supporting legs along the entire length and off the ends of the bar without disturbing the bar or altering its position.

2. An apparatus for gaging pistons comprising a bar with a straight edge, supporting legs depending from the bar, means at the ends of the legs for fixing them in position with the straight edge of the bar at right angles to the surface to be gaged, a gaging arm with a straight edge extending at right angles to the straight edge on the bar, said arm being movable back and forth toward and from said supporting legs along the entire length and off the ends of the bar without removing the bar from the supporting legs, and a spring for retaining said arm with the straight edge on the arm at all times at right angles to the straight edge on the bar.

3. An apparatus for gaging pistons comprising a bar, supporting legs depending from the bar, clamping feet at the lower ends of the legs, and a gaging arm movable back and forth along the bar.

4. An apparatus for gaging pistons comprising a bar with a straight edge, supporting legs adjustably fixed to the back of the bar, means at the ends of the legs for fixing them in position with the straight edge of the bar at right angles to the surface to be gaged, and a gaging arm with a straight edge extending at right angles to the straight edge on the bar, said arm being movable transversely back and forth toward and from said supporting legs along the entire length and off the ends of the bar without interference by the supporting legs.

5. An apparatus for gaging pistons comprising a bar with a straight edge, supporting legs depending from the bar, means at the ends of the legs for securing them in position with the straight edge of the bar at right angles to the surface to be gaged, a head movable back and forth the entire length of the bar, and a gaging arm with straight edges on opposite sides extending at right angles to the straight edge on the bar, depending from the head.

6. An apparatus for gaging pistons comprising a bar, supporting legs depending from the bar, brackets extending forward from the legs near their lower ends, perforated feet extending forward from the legs at their lower ends, thumb screws turning through said feet, blocks swiveled on the upper ends of said thumb screws, and a gaging arm movable back and forth along the bar.

7. An apparatus for gaging pistons comprising a bar, supporting legs depending from the bar, clamps at the lower ends of the legs for securing them in position, a head embracing and adapted to move along said bar, a spring carried by said head and engaging the bar, and a gaging arm depending from said head at right angles to the bar.

LOUIS R. SPENCER.