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Patented Apr. 25, 1899.

A. H. KRAUSS.
VALVE OPERATING GEAR.

(Application filed Oct. 26, 1898.)

(No Model.)

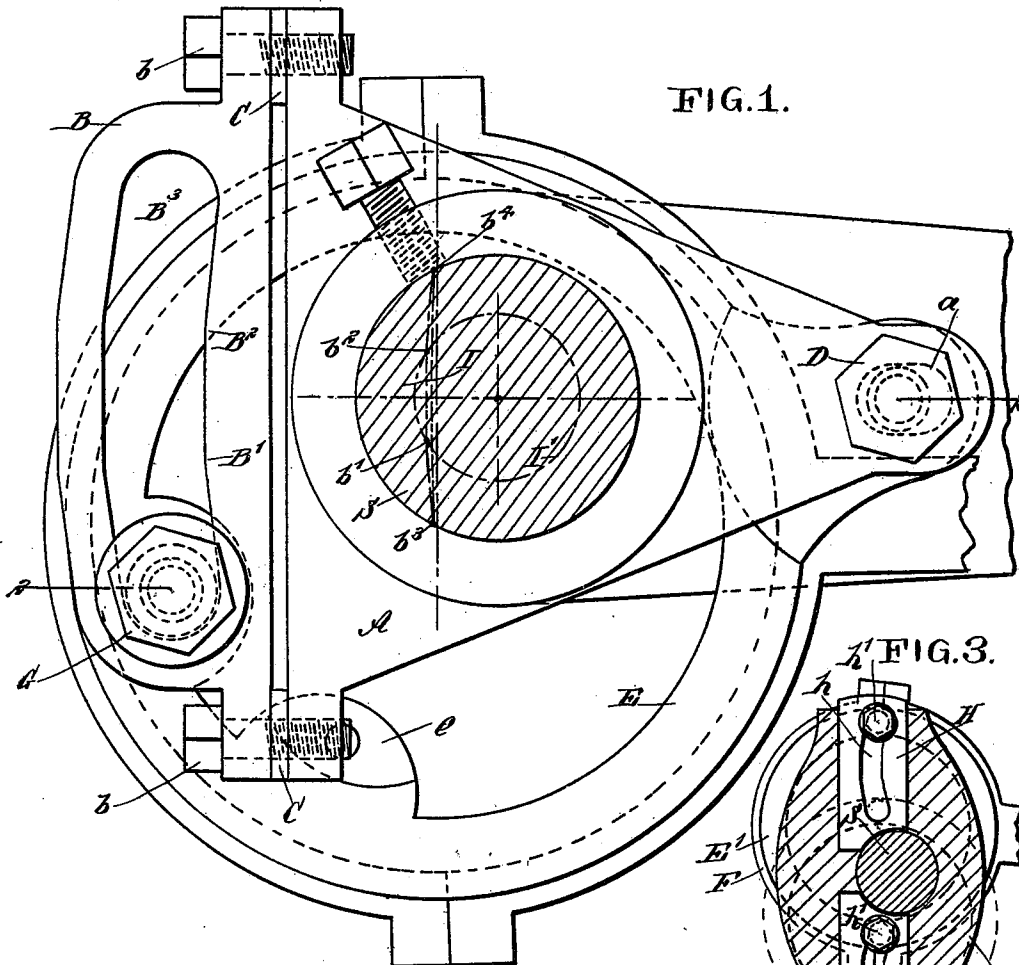
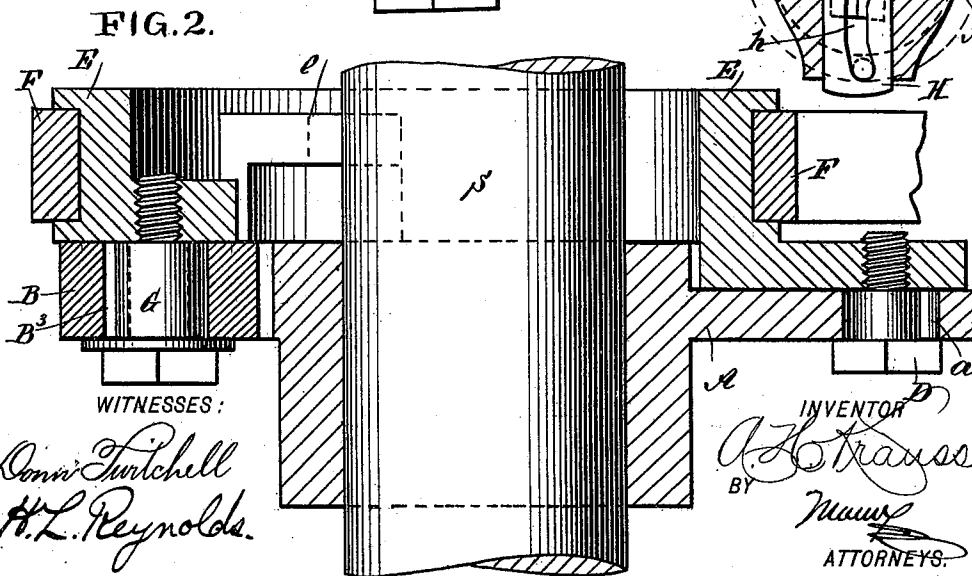


FIG. 1.



WITNESSES:

Donn Twitchell
H. L. Reynolds

INVENTOR
A. H. Krauss
BY *Mauw*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

AUSTIN H. KRAUSS, OF WYMORE, NEBRASKA.

VALVE-OPERATING GEAR.

SPECIFICATION forming part of Letters Patent No. 623,915, dated April 25, 1899.

Application filed October 26, 1898. Serial No. 694,641. (No model.)

To all whom it may concern:

Be it known that I, AUSTIN H. KRAUSS, of Wymore, in the county of Gage and State of Nebraska, have invented a new and Improved Valve-Operating Gear, of which the following is a full, clear, and exact description.

My invention relates to improvements in valve-operating gears of that class which include an eccentric mounted so that its position may be shifted laterally of the shaft to vary the cut-off and to reverse the engine.

My invention comprises the novel features hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my device, the engine-shaft being shown in section. Fig. 2 is a horizontal section on the line 2 2 in Fig. 1; and Fig. 3 is an elevation, partially in section, of a slightly-modified construction.

The object of my invention is to produce a valve-gear which shall vary the lead of the valve for the different cut-offs, giving the valve a greater lead for the earlier cut-offs.

Upon the engine-shaft S is fixedly secured a hub A, having flanges, one of which is provided with a slot *a*, extending in a diametrical direction. To the other two flanges is secured, by means of bolts *b*, a plate B, provided with a slot B³, which controls the position of the eccentric. The slot B³ is curved, but is substantially at right angles to the diameter upon which the slot *a* is located and is bisected by said diameter. Instead of being an arc of a circle the slot B³ is divided into three portions, the central portion, extending from B' to B², being substantially straight and at right angles to the diameter extending through the slot *a*. The end portions, extending from the points B' and B² to each end, are curved, being an arc of a circle; but the points B' and B² are nearer to the pivot-center in the slot *a* than the outer ends of the slot B³.

I lay broad claims on the above-named special features in that the center of eccentric in being shifted moves neither on a straight line continuously nor on an arc constructed by a radius the length of the distance from center of eccentric to the center of pivot-bolt.

The eccentric consists of a ring E, provided with a flange at one side carrying a pivot-bolt D, which passes through the slot *a*. This bolt fits in the slot with sufficient looseness so that it may be readily moved therein. The eccentric is provided with a suitable eccentric-strap F. The eccentric is further secured to the hub by means of a clamping-bolt G, which extends through the slot B³ and into the eccentric. By this means the eccentric may be adjusted in the slot at any point desired. When the bolt is at the end of the slot, the travel of the valve is the greatest and the cut-off is at the latest point. As the bolt is moved toward the center travel of the valve is decreased and the cut-off is made earlier. When the clamping-bolt G is shifted to the opposite side of the center, the motion of the valve will be changed, so that the rotation of the engine is reversed. This is according to the well-known manner of reversing an engine by shifting the eccentric.

The points B' and B² in the slot B³ being nearer to the pivot-point than the outer ends of the slot results in giving an increased lead to the valve when the eccentric is shifted so as to obtain an earlier cut-off. This results in an increased economy in the use of the steam.

For convenience in adjusting the parts the plate B, which contains the slot B³, is secured to the hub A, and washers or packing-strips C are inserted between the two. The proper adjustment of the two parts may thus be accurately secured.

At I in Fig. 1 is shown an arc of a circle corresponding to the movement of the eccentric-center in the ordinary form of pivoted and swinging eccentric. The lines passing through the points *b*³, *b*¹, *b*², and *b*⁴ show the relative position of such eccentric when mounted in accordance with my invention. The inner circle I' represents the earliest cut-off by which effectual work can be performed, and for that reason the points *b*¹ and *b*² are located at the intersections of the circle I' and the arc *b*³ *b*⁴. The points *b*¹ and *b*² can be placed as far from the arc *b*³ *b*⁴ as the lead is desired to be increased.

In Fig. 3 is shown a modified construction in which the pivot for the eccentric is omitted, and in lieu of the pivot the hub A' is pro-

vided with plates H, having slots *h* therein corresponding in their shape and construction with the slot in the plate B. One of these plates is placed upon each side of the shaft, and the eccentric E' is secured thereto by means of bolts *h'*, passing through the slots *h*. The eccentric is controlled by this means in exactly the same manner as by the means shown in Figs. 1 and 2. This change is simply the substitution of guides for the pivot as used in the other figures.

The flange *e* indicates a means by which the eccentric may be engaged by the controlling or shifting mechanism. Any of the usual forms of shifting mechanism may be employed. As this forms no part of my present invention, such mechanism has not been shown.

The principal feature of this invention lies in the use of the peculiar form of slot B³, in connection with the slot *a*, by which the eccentric may be adjusted to give the valve the desired amount of lead for any amount of valve travel. The eccentric may be connected with any suitable form of governor and be moved thereby to automatically control the valve in a manner corresponding to that of the ordinary swinging eccentric. In such case the bolt or pin D is left sufficiently loose in the slot *a*, so that it may slide therein as made necessary by the movement of the slotted plate B upon the bolt G. The governor may be a shaft-governor or any other convenient form. Where it is not desired to make the engine reversible, one-half of the slot B³ may be omitted.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A valve-operating mechanism, comprising a hub mounted to rotate with the engine-shaft, and having on one side of the center a slot extending in a diametrical direction and adapted to receive the pivot-bolt of an eccentric, and also having a second slot substan-

tially perpendicular to and bisected by the diameter passing through the first slot, and an eccentric having a pivot passing through the first slot, and a clamping-bolt passing through the second slot, said second slot having its central portion nearer to the pivot than the end portions, substantially as described.

2. A valve-operating gear, comprising a hub mounted upon the engine-shaft, and having on one side a diametrically-extending pivot-slot, and on the other side a curved slot adapted to receive a clamping-bolt, the center of said curved slot being straight and nearer to the pivot-slot than the ends, and an eccentric having pivot and clamping bolts adapted to enter their respective slots, the pivot-bolt fitting loosely in its slot, substantially as described.

3. A valve-operating gear, comprising a hub mounted upon the engine-shaft, and having on one side a diametrically-extending pivot-slot, and on the other an adjustable plate having a curved slot therein adapted to receive a clamping-bolt, the center of said curved slot being nearer to the pivot-slot than the ends, and an eccentric having pivot and clamping bolts adapted to enter their respective slots, substantially as described.

4. A valve-operating gear, comprising a hub mounted upon the engine-shaft, and having on one side a diametrically-extending pivot-slot, and on the other a curved slot extending substantially perpendicular to and bisected by the diameter passing through the pivot-slot, said slot being divided into two end portions and a straight central portion, the end portions having their inner ends nearer to the pivot-slot than their outer ends, and an eccentric having a pivot-bolt adapted to loosely enter the pivot-slot, and a clamping-bolt adapted to enter the curved slot and by which the eccentric is adjusted, substantially as described.

AUSTIN H. KRAUSS.

Witnesses:

FREDERICK W. MOHRBACHER,
HENRY GRAFF.