E. A. WILLIAMS & A. W. PRICE.

ENGINE.

APPLICATION FILED MAY 6, 1907.

906,344.

Patented Dec. 8, 1908.

2 SHEETS—SHEET 1.

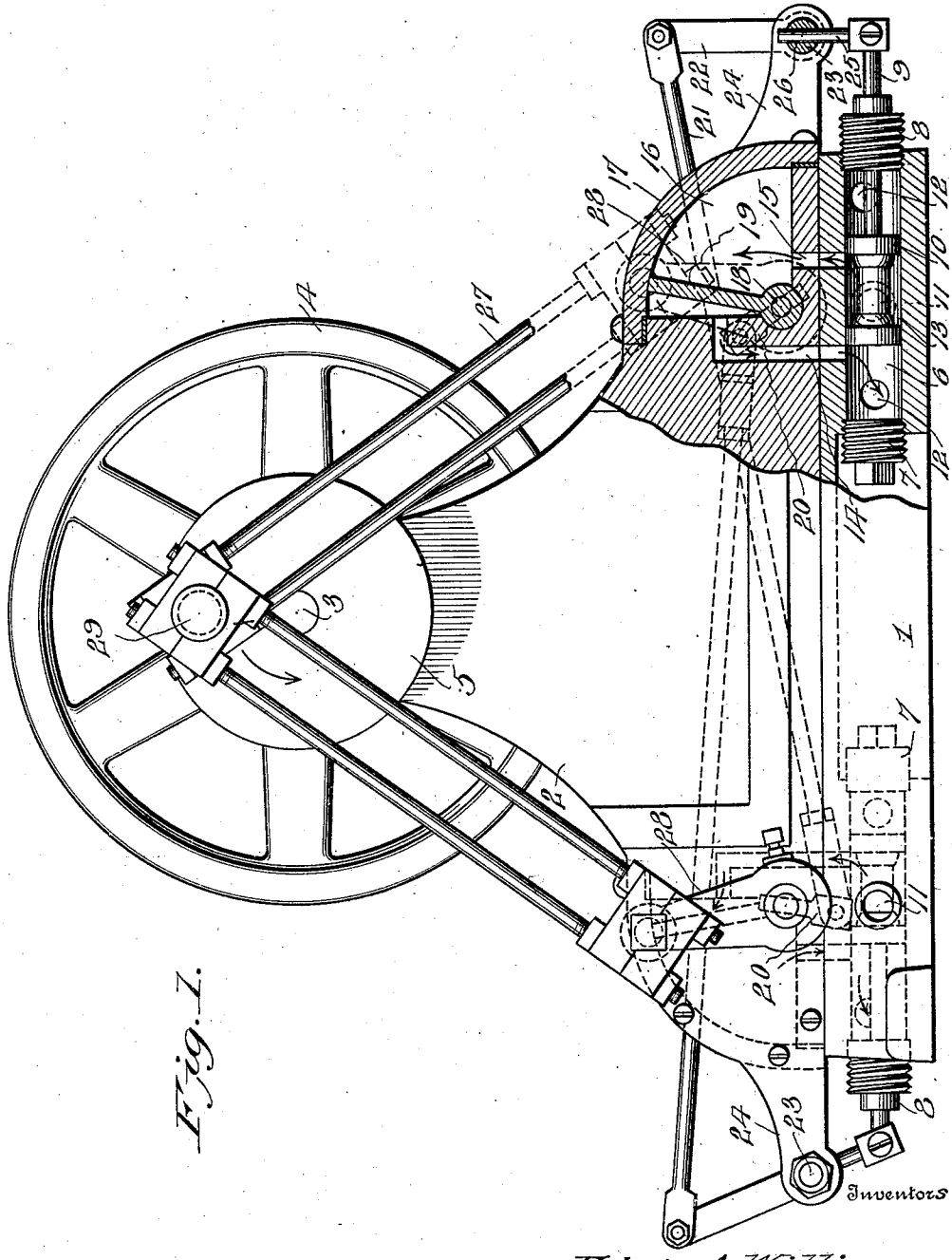

Fig. 1.

Witnesses

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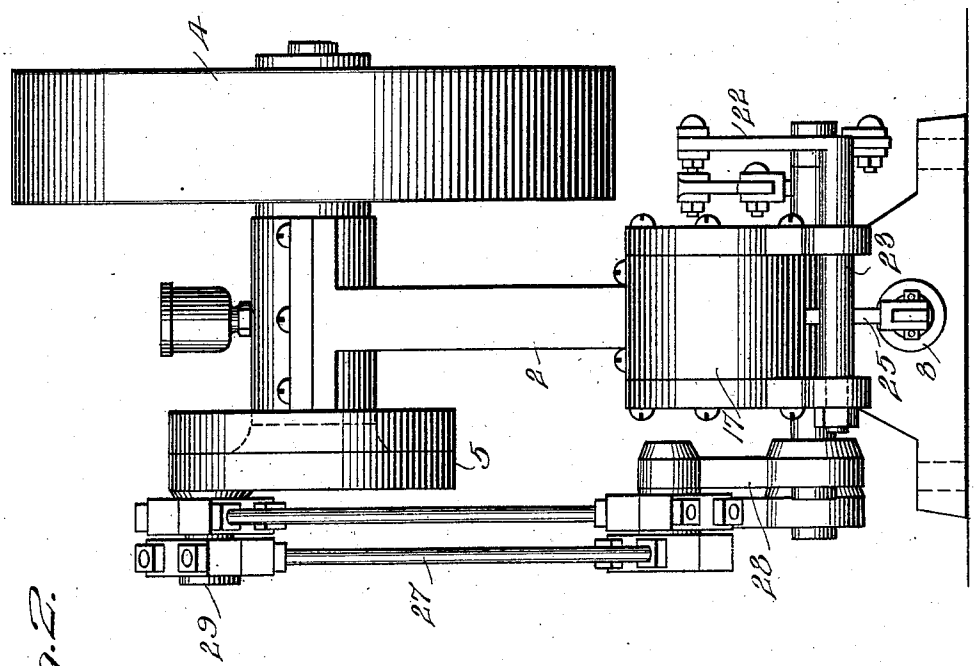

Fig. 2.

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UNITED STATES PATENT OFFICE.

EDWIN A. WILLIAMS AND ASA W. PRICE, OF WARSAW, NEW YORK.

ENGINE.

No. 906,344. Specification of Letters Patent. Patented Dec. 8, 1908.

Application filed May 6, 1907. Serial No. 372,019.

To all whom it may concern:

Be it known that we, EDWIN A. WILLIAMS and ASA W. PRICE, citizens of the United States, residing at Warsaw, in the county of Wyoming and State of New York, have invented new and useful Improvements in Engines, of which the following is a specification.

This invention relates to steam engines, and it has for its object to present an engine of simple and improved construction embodying oscillatory pistons supported for operation in steam chests of segmental shape, said pistons being mounted upon rock shafts having cranks from which motion is transmitted to a main shaft carrying a fly wheel, said main shaft being thus continuously driven.

A further object of the invention is to avoid the formation of a dead center, thus enabling the machine to be started at any point.

A further object of the invention is to avoid the use of cross heads and guides for the same, thus enabling the engine to be run at high speed.

Still further objects of the invention are to provide a simple and light engine of high efficiency, which may be successfully operated in any position in which it may be placed.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described and particularly pointed out in the claim.

In the accompanying drawing, has been illustrated a simple and preferred form of the invention; it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawing:—Figure 1 is a side elevation, partly in section, of a steam engine embodying the invention. Fig. 2 is an end view of the same.

Corresponding parts in both figures are denoted by like characters of reference.

The base 1 of the improved engine supports a suitably constructed frame 2 having bearings for the main shaft 3, which carries the fly wheel 4 and eccentric disk, 5. The base is provided at the ends thereof with longitudinal bores 6 constituting valve chests, the inner and outer ends of which are closed by means of screw plugs 7 and 8; the latter being provided with apertures for the passage of the stems 9 of valves 10 that are arranged for reciprocation in the bores or chests 6. The latter are provided intermediate the ends thereof with ports 11 for the admission of live steam; and near the ends of the steam chests are formed apertures 12 constituting exhaust ports. The valves 10 are of the ordinary piston type, being provided with annular grooves 13 which, in the various positions of the valve, serve to place the inlet and exhaust ports in communication with the ducts 14 and 15 leading to opposite ends of the segmental steam chests 16 formed at the ends of the frame, said steam chests being provided with curved or arcuate caps 17.

Mounted for oscillation in the steam chests, concentric with the caps 17 are rock shafts 18 carrying the pistons 19 which latter are oscillated by impact and by the expansive power of the steam admitted through the ducts 14 and 15 alternately, each of said ducts being alternately in communication with the source of steam supply and with the exhaust ports according to the position of the pistons. The pistons are actuated by means including cranks 20 that extend radially from the rock shafts 18, said cranks being connected by links or rods 21 with arms or cranks 22 extending radially from the rock shafts 23 supported in brackets 24 at the ends of the frame. The valve stems 9 are provided at their outer extremities with pivoted arms 25 extending through apertures 26 in the rock shafts 23 so that, as the said rock shafts oscillate in their bearings, the valve stems and valves will be reciprocated.

Motion is transmitted from the rock shafts 18 carrying the pistons to the main shaft 3, by means of links or connecting rods 27 connecting cranks 28 extending radially from the rock shafts 18 with a wrist pin 29 upon the eccentric disk 5, the parts being so adjusted that a complete throw or movement of either piston in one direction will impart rotation to the main shaft to the extent of one-half revolution.

Pipes or conduits for conducting live and exhaust steam, and valves for controlling the admission of steam are to be provided; and oil cups for lubricating the parts may be used wherever needed; the links and connecting rods are likewise to be constructed in such a

manner that the necessary adjustments may be conveniently effected; but these and other features of like nature have not been shown in detail as they do not form a part of the present invention.

The operation of the improved engine will be readily understood from the foregoing description taken in connection with the drawings hereto annexed, by those skilled in the art to which it appertains. When the machine is in operation, the valve at each end of the engine is actuated by the rock shaft carrying the piston at the opposite end, and the arrangement is such that in the various positions of the valves, steam will be alternately admitted to the opposite ends of the steam chests where it serves to rock or oscillate the pistons, the exhaust steam being guided to the exhaust ports.

The improved engine is very simple in construction, and it has been practically demonstrated that an engine of high efficiency may be constructed according to this invention of very small dimensions and light in weight, rendering it available for a variety of purposes where heavy and bulky machinery would not be serviceable. Another important and valuable feature of the improved engine is that it may be successfully run in any position in which it may be placed.

Having thus described the invention, what is claimed, is:—

In a steam engine, a base provided with terminal bores forming valve chambers, a frame having segmental steam chests disposed contiguous to said valve chambers, piston carrying rock shafts supported in the steam chests, valves arranged for reciprocation in the chambers and having axial stems, suitably supported apertured rock shafts having radial cranks, arms pivoted upon the valve stems and extending through the apertures of the rock shafts, cranks extending radially from the piston carrying shafts, and links connecting said cranks with the cranks extending from the apertured rock shafts.

In testimony whereof, we affix our signatures in presence of two witnesses.

EDWIN A. WILLIAMS.
ASA W. PRICE.

Witnesses:
M. W. CAMPBELL,
MURRAY WISEMAN.