

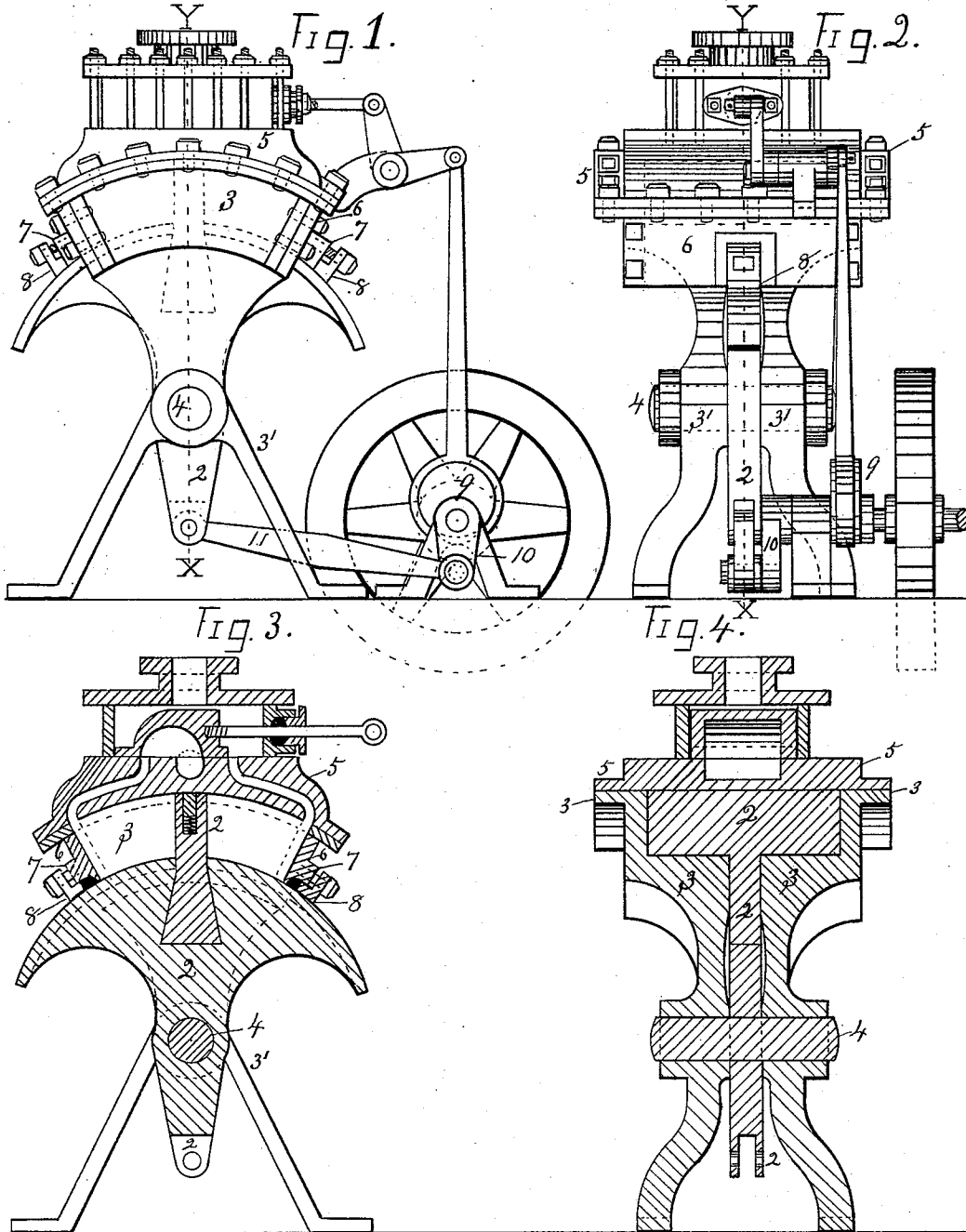
(No Model.)

2 Sheets—Sheet 1.

S. BAADER,
STEAM ENGINE.

No. 487,025.

Patented Nov. 29, 1892.



WITNESSES:
J. B. Shinn.
M. A. Wellman.

INVENTOR
Stephan Baader.
BY
John Shinn.
ATTORNEY.

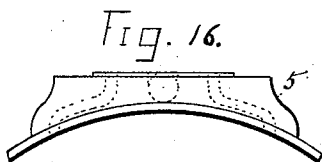
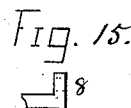
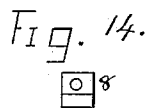
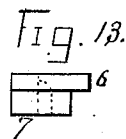
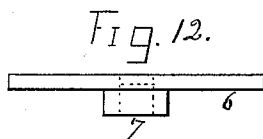
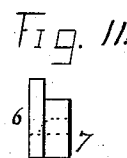
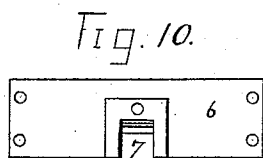
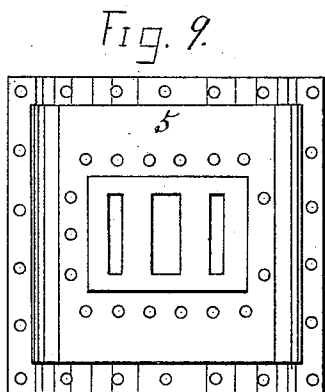
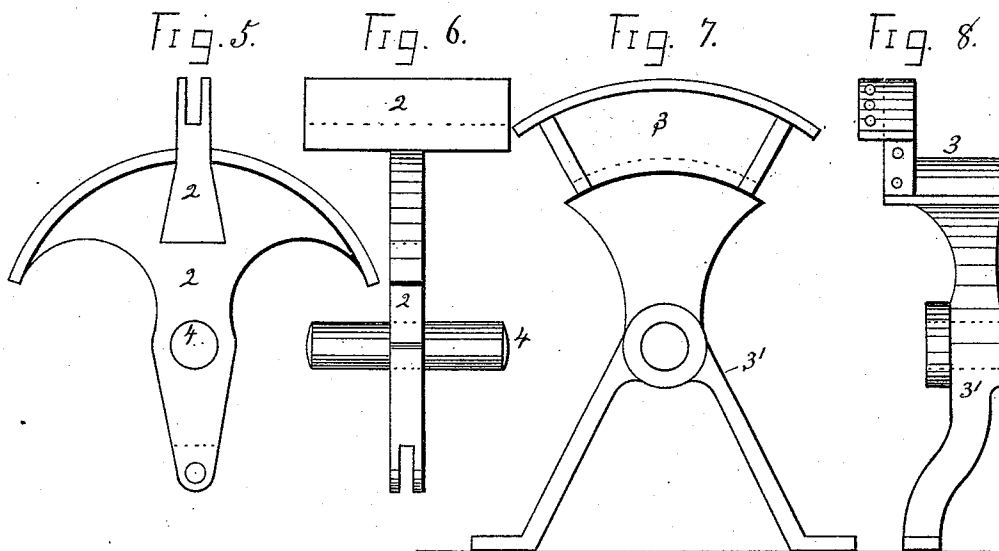
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2 Sheets—Sheet 2.

S. BAADER.
STEAM ENGINE.

No. 487,025.

Patented Nov. 29, 1892.



WITNESSES:

J. B. Shinn.
M. A. Wellman.

INVENTOR

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UNITED STATES PATENT OFFICE.

STEPHAN BAADER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-FIFTH TO MARTIN SCHUSTER, OF SAME PLACE.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 487,025, dated November 29, 1892.

Application filed May 2, 1892. Serial No. 431,584. (No model.)

To all whom it may concern:

Be it known that I, STEPHAN BAADER, a subject of the Emperor of Germany, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Vibrating-Lever-Piston Steam-Engines, of which the following is a specification.

My invention relates to a class of engines having a vibrating-lever wing-piston working in a semicylinder, and has for its object to construct a steam-engine that will occupy a small space, run at a high speed, and made of few parts and at a low cost. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a steam-engine constructed according to my invention. Fig. 2 is an end elevation. Fig. 3 is a vertical section taken on the line X Y of Fig. 2. Fig. 4 is a vertical section taken on the line X Y of Fig. 1. Figs. 5 and 6 are views of the piston-lever. Figs. 7 and 8 are views of a one-half part of the frame and steam-cylinder. Fig. 9 is a top view of the cylinder-bonnet. Figs. 10, 11, 12, and 13 are views of the cylinder sides and stuffing-box. Figs. 14 and 15 are views of the stuffing-box follower. Fig. 16 is an edge view of the cylinder-bonnet.

Similar numerals refer to similar parts throughout the several views.

2 represents the lever-piston, and 3 the parts which form the steam-cylinder. The lower part 3' forms a frame in which the piston-lever is hung and oscillates on shaft 4.

5 represents the cylinder-bonnet, which bonnet forms the top covering of the steam-cylinder.

6 represents one of the sides. These sides 6, in connection with the bonnet 5, connect the two halves 3, and they form the semicylinder. These parts may all be cast in metal. All working surfaces are fitted by boring, turning, or planing. The piston is fitted with spring-packing, such as shown in section, Fig. 3. The construction of this class of steam-packing is well known to machinists and engineers. A general description is not required here.

7 represents a stuffing-box formed in the

sides 6, and 8 represents a follower for these stuffing-boxes. These followers are connected and adjusted in the stuffing-boxes by a regulating-screw. (Shown in Figs. 1 and 3.)

In putting the engine together the piston-lever is by the shaft 4 hung in the frame 3' and the bonnet 5 bolted to the parts 3. The sides 6 are then bolted by tap-screws to the parts 3. The joints of the bonnet and sides 6 are made with a steam-joint of gum or other suitable packing.

The engine is provided with a steam-chest and slide-valve of ordinary construction, as shown in Figs. 1, 2, 3, and 4, which valve is connected and operated by an eccentric 9, as shown in Figs. 1 and 2. The lower end of piston-lever 2 is connected to a crank 10 by a pitman 11. (See Fig. 1.)

The valve-stem, steam-chest, stuffing-box, bell-crank lever, and eccentric connections are of the ordinary construction, are not new, and are well known to machinists and engineers. Therefore no description is required in this specification.

The operation of my improved steam-engine is as follows: Steam is admitted by the slide-valve through the steam-openings shown in Fig. 3 and acts against the piston 2, vibrating it. The lower end being connected by the pitman 11 will give a rotary motion to crank 10. If the slide-valve be operated by a "link-motion," the engine may be reversed at will and operated in either direction.

In the drawings the piston-lever is shown as constructed two to one—that is, the length of the lever above the shaft 4 is twice of that below and the stroke of the piston will be double of the stroke of the crank. This will be advantageous when using steam expansively or "compound."

If desired, two engines may be connected to one crank-shaft and cranks set to work at right angles, and one cylinder may exhaust into the other, working compound.

Engines constructed according to my invention, as above described, are compact, take but little room, may be run at a high speed, and are not expensive to construct.

Having as above fully described the construction and operation of my improved vi-

brating-lever-piston steam-engine, what I claim as new, and desire to secure by Letters Patent, is—

5 In a vibrating-wing-piston engine for motive power, the combination of a pivoted lever having a segmental-formed head, to which head is centrally fixed a single wing-piston, and a semicylinder piston-chamber, in which chamber the wing-piston is vibrated by steam-
10 pressure acting alternately on each side of

said wing-piston, the semicylinder having but one steam opening or passage on each side of the piston, through which opening both live and exhaust steam pass in and out of the cylinder in operating the engine, substantially as shown and described. 15

STEPHAN BAADER.

Witnesses:

JOHN SHINN,
JOHN DOLMAN, Jr.