

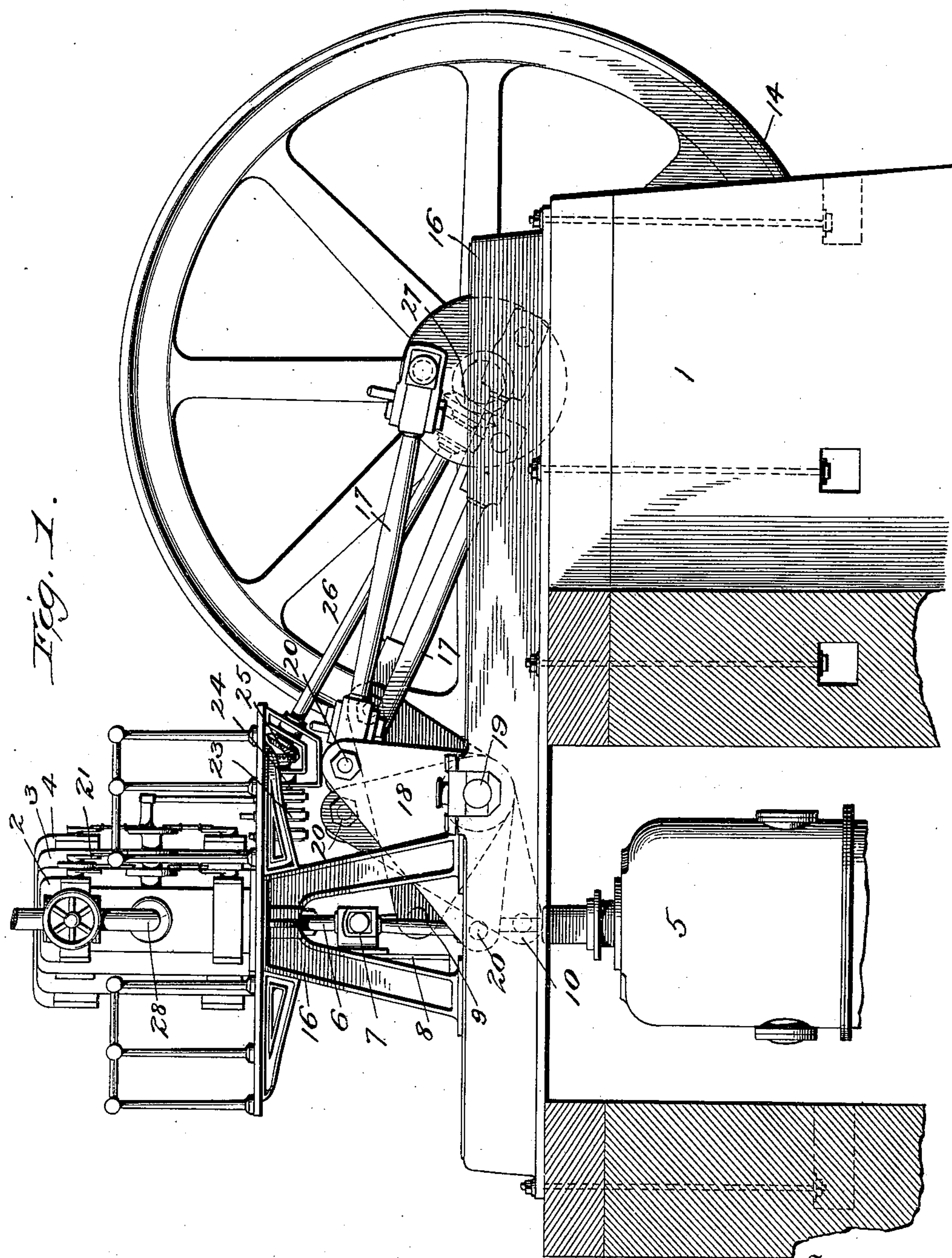
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3 Sheets—Sheet 1.

W. WRIGHT.
STEAM ENGINE.

No. 564,547.

Patented July 21, 1896.



Witnesses
Wm. H. Hamilton
Geo. R. Hamilton

Inventor:
William Wright
per Rhoads & Co.
Attorney

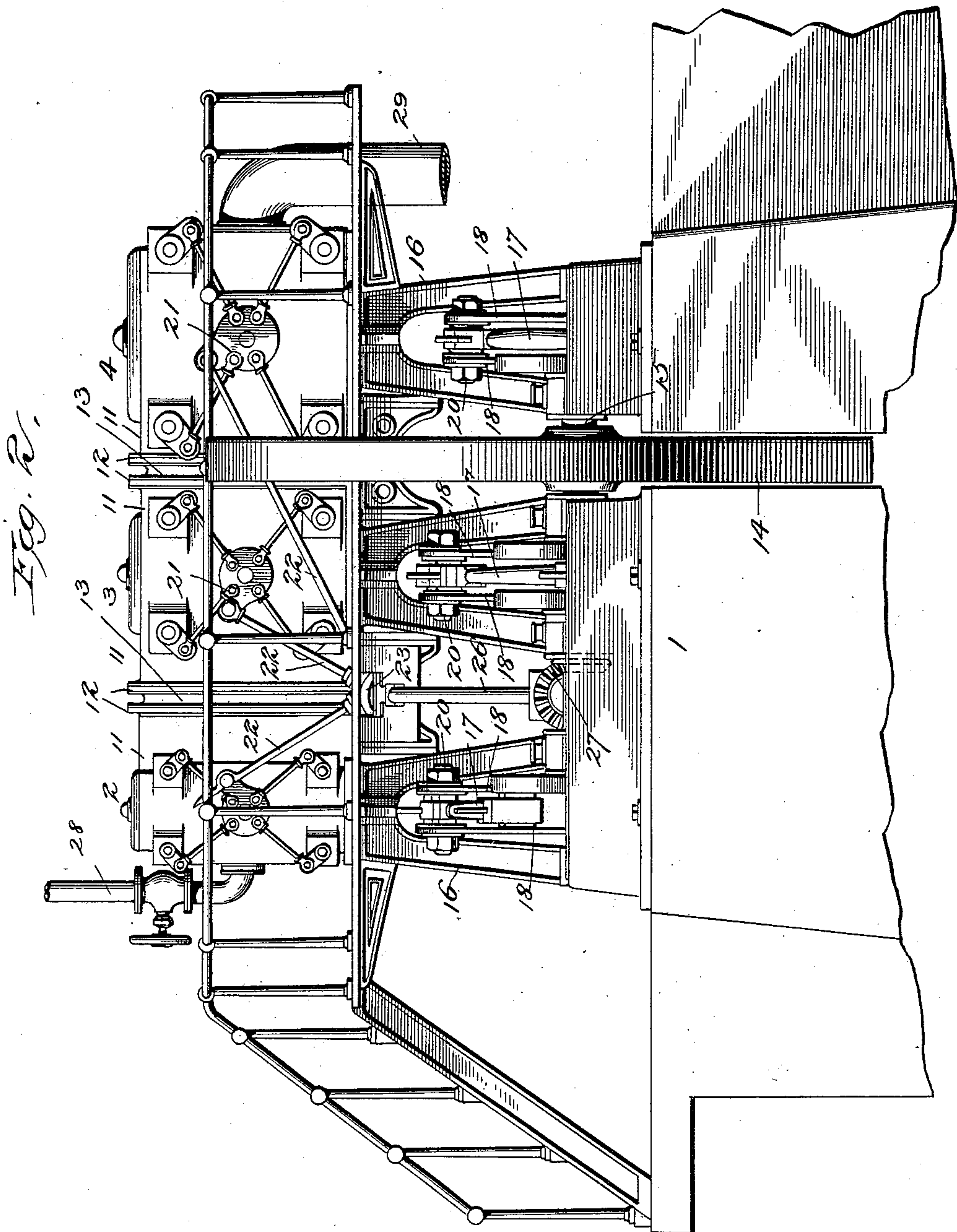
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W. WRIGHT.
STEAM ENGINE.

No. 564,547.

Patented July 21, 1896.



Witnesses
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Inventor:
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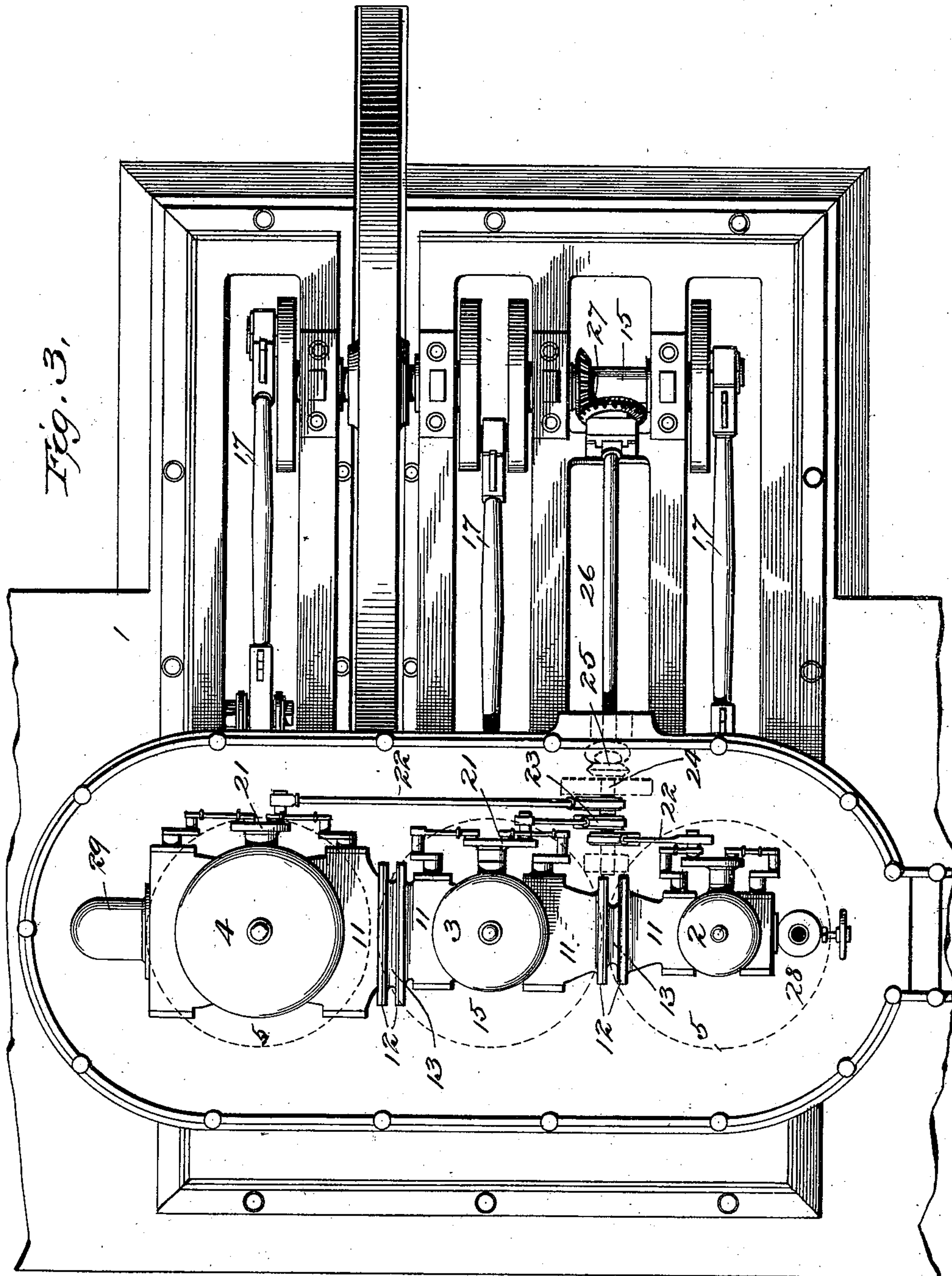
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3 Sheets—Sheet 3.

W. WRIGHT.
STEAM ENGINE.

No. 564,547.

Patented July 21, 1896.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT, OF NEWBURG, NEW YORK, ASSIGNOR TO MARY E. WRIGHT, OF SAME PLACE.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 564,547, dated July 21, 1896.

Application filed February 17, 1896. Serial No. 579,563. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WRIGHT, a citizen of the United States, residing at Newburg, in the county of Orange and State of New York, have invented certain new and useful Improvements in Steam-Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to stationary engines of the vertical type, and particularly to the larger class employed for heavy continuous work, such as pumping water for cities, operating cables, electric-light plants, &c.

The object of my invention is to bring the cylinders closer to the ground in order to lessen the labor of oiling and cost of attendance and to permit the parts to be taken apart with greater facility for repairs, and which will be more solid, steady, and durable.

My object is to reduce the height and construct the parts in such a manner that they will be rendered far more accessible and convenient for repairs, will cost less to set up, and can be kept in running order with greater ease and at reduced expense.

A further object of my invention is to arrange the mechanism so as to prevent the usual pounding in the cylinders caused by the counteracting effect of two pistons reaching the termination of their stroke simultaneously.

To this end my invention consists in a peculiar kind of structure combining the features of a vertical and horizontal engine, the cylinders being vertical and the connecting-rods moving in a substantially horizontal plane.

My invention further consists in other peculiarities and combinations which will be more fully described hereinafter, and pointed out in the claims.

In the present instance my improvements are shown applied to a triple-expansion pumping-engine, but they can be applied with equal facility to various other kinds.

In the accompanying drawings, Figure 1 represents a side elevation of my improvements; Fig. 2, a front elevation, and Fig. 3 a top view.

The reference-numeral 1 denotes the foundation on which my improvements are mounted, and 2, 3, and 4 single, double, and triple expansion cylinders, respectively, disposed in a horizontal series above a corresponding series of bucket and plunger pumps 5. The piston-rod 6 of each piston is connected to a sliding cross-head 7, which reciprocates on a vertical guide 8. Motion is communicated to each of the pumps below by a straight link 9 and piston-rod 10. By thus arranging the steam-cylinders in horizontal series instead of vertical series they are brought down lower, greater steadiness is insured, and they are more convenient for repairs and attention.

In place of the unsightly pipes generally used for conveying steam from one cylinder to another, I cast on the opposite side of each cylinder a receiver 11, having flanges 12. These receivers are connected by their flanges to an intervening expansible connection 13 of accordion form and made of copper to allow for the contraction and expansion of the metal due from cooling and heating, thereby always maintaining a secure, neat, tight, compact, and durable connection between the cylinders.

The fly-wheel 14 is fixed upon a horizontal crank-shaft 15, located outside of the vertical frame 16 and on the right of and parallel with the line of the steam-cylinders, in order to allow the latter to be brought down lower, the crank-shaft to be removed without difficulty, and the connecting-rod given any suitable length without adding to the height of the engine. As a still further means of reducing the height of the whole structure and adding to its stability, the crank-shaft 15 and the beam-shaft 19 are journaled in substantially the same horizontal plane in the bed-plate 30. By this construction the strain on the various parts of the mechanism is distributed over a greater surface, so that a lighter foundation can be used. The cranks 31 on shaft 15 are placed at an angle of one hundred and twenty degrees with each other,

whereby a constant and uninterrupted movement in the water discharge is effected and a uniform resistance offered during the working of the engine.

5 The connecting-rods 17 are connected with the piston-rods by half-beams or bell-cranks 18, fulcrumed on a shaft 19 between the crank-shaft and vertical frame 16. These bell-cranks consist each of a pair of triangular
10 plates placed side by side with base upward, the piston-rods and connecting-rods being connected thereto between the plates at the opposite ends of the cranks by bolts 20, passing through the plates and rod. Each cylinder
15 is provided with a valve-gear 21 of the well-known "Corliss" pattern, each gear being connected by rods 22 to eccentrics 23 on a common shaft 24, connected by bevel-gears 25 to the end of an obliquely-extending rod
20 26, which rod is in turn connected by gears 27 with the crank-shaft. Any suitable governor can be applied to regulate the speed of the engine. Steam is introduced and discharged from the cylinder by the pipes 28
25 and 29, respectively.

In addition to the advantages already mentioned it should be stated that in the stationary engines heretofore devised great difficulty attended the removal and insertion of the
30 parts and their height made them unsteady. This latter trouble is aggravated when one cylinder is placed above the other in triple or tandem expansion engines, thereby requiring heavier foundations and a higher engine-
35 room in order to secure sufficient stability.

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

1. The combination in a steam-pump of
40 the vertical-cylinder type, of multiple-expansion cylinders placed side by side in horizontal alinement and supported upon a frame, a bed-plate on which the frame is mounted, pistons provided with piston-rods depend-

ing from said cylinders and having their 45 lower ends joined to suitable cross-heads operating on guides, a parallel series of pumping-cylinders located directly below the steam-cylinders, a horizontal crank-shaft parallel
50 with the line of cylinders, and a corresponding series of cranks extending at angles of substantially one hundred and twenty degrees radial variation, said shaft being located outside said cylinder-frame and jour-
55 naled in the bed-plate, half-beams for each cylinder and rocking on a parallel shaft located between the cylinder-frame and crank-shaft and also mounted on the bed-plate, connecting-rods between the half-beams and crank-shaft, and means for operating the
60 steam-distribution valves, and adapted to operate in the manner and for the purpose set forth.

2. In a multiple-expansion steam-pump, the combination with a plurality of vertical 65 cylinders placed side by side in horizontal alinement, and mounted upon a vertical frame supported upon a bed-plate and having pistons provided with depending rods, of pumping-cylinders whose pistons are con-
70 nected to said depending rods, a parallel crank-shaft 15, located outside the vertical frame and provided with cranks having a radial variation of one hundred and twenty degrees, and connected to the piston-rods by
75 connecting-rods, half-beams and links for each cylinder, said half-beams being located intermediate of the crank-shaft and frame, and individual valve-gear connected with eccentrics mounted on a common shaft, and
80 means connecting the latter with the crank-shaft, substantially as described.

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

WILLIAM WRIGHT.

Witnesses:

WALTER C. ANTHONY,
W. M. TERPENING.