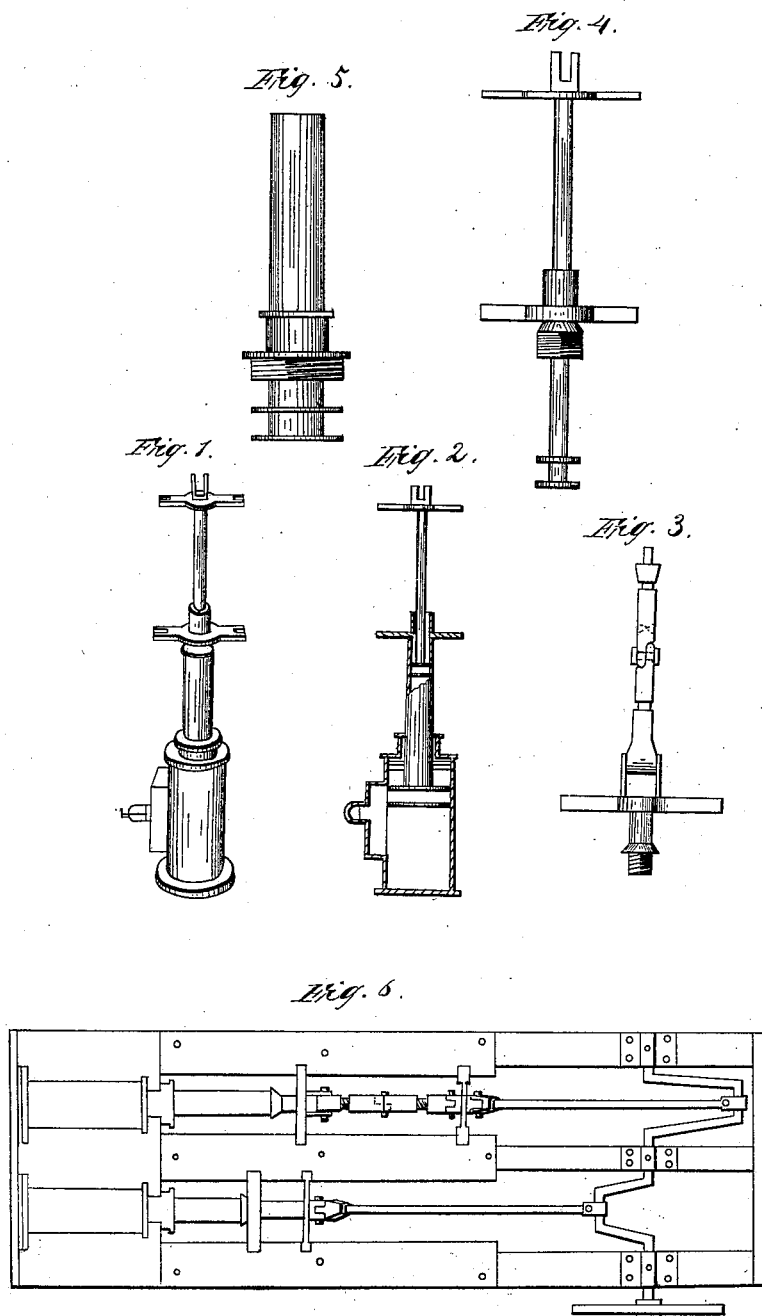


J. R. St. John,
Steam-Engine Piston.
No 2,070.
Patented Apr. 27, 1841.



UNITED STATES PATENT OFFICE.

JOHN R. ST. JOHN, OF CLEVELAND, OHIO.

CONSTRUCTING AND COMBINING THE PISTON-RODS OF STEAM-ENGINES TO ENABLE
ANY LENGTH OF CRANK TO BE USED.

Specification of Letters Patent No. 2,070, dated April 27, 1841.

To all whom it may concern:

Be it known that I, JOHN R. ST. JOHN, of the city of Cleveland, Cuyahoga county, and State of Ohio, have invented a new and
5 Improved Mode of Applying Power by means of a "Compound Piston-Rod" (or its substitute), as shown in the model and drawings accompanying this petition and specification, of which the following is intended to be a full and exact description.

The nature of my invention consists in the susceptibility of elongation and contraction of the agent between the power and the object, greater than ever before accomplished, by means of the "compound piston-rod," or its substitute referred to.

To enable others to use my invention, I will describe its construction and arrangement, by referring to the drawings, Nos.
20 1 and 2.

Drawing No. 1, Figure 5, shows the main or female piston-rod, made hollow, but in all other respects like the usual or common piston-rod, and the drawing represents as
25 passing through the cylinder head and packing collar, (marked Figs. 5 and 8). Fig. 4 represents the male piston-rod passing through the jaws which are to be attached to the outer end of the female piston-rod, through which it plays or moves. This
30 male piston-rod has its own jaws attached to the outer end and to which the pitman is attached. Fig. 2 represents an inside view of the cylinder with the female piston-rod inserted and the male piston-rod inserted
35 into that. Fig. 1, represents the cylinder and the "compound piston-rod" drawn out to the greatest length. Fig. 3, represents "the substitute," which may be used instead
40 of the male piston-rod herein described, and which is a common elbow fixed between the pitman and female piston-rod opening and shutting and moved and governed by the motion of the female piston-rod.

Drawing No. 2, represents two cylinders with the "compound piston-rod" to each, attached to cranks placed at right angles upon the shaft, by pitman. As two or more
45 cylinders, &c., may be used upon one shaft, I have placed two, and will describe their parts, positions and movements by reference to the letters thereon as follows, first designating the cylinders No. 1 and No. 2; also the female piston-rods, Nos. 1 and 2; also
50 the male piston-rods Nos. 1 and 2. Thus,

then, is the motion created and continued. The steam has been applied to cylinder No. 2, at point *a*, which carried the female No. 2, to point *c*; female 2 rests there while the power is applied to cylinder No. 1, at point
60 *a*, which carries female No. 1, to point *c*, in performing which the shaft has moved around and drawn male piston No. 2 out of female No. 2 its full length; the power is now applied to cylinder No. 2 at point *b*,
65 which moves the female No. 2 into its cylinder; during this time female No. 1 has stood still, and male No. 1 has by the motion of the shaft been drawn out of female No. 1, its full length, when the power is applied
70 to cylinder No. 1 at point *b*, and forcing female No. 1, into her cylinder, the motion of the shaft forces male No. 2 into female No. 2, when cylinder No. 2 is again ready to receive power at point *a*, and thus the
75 motion is kept up.

The construction of the female piston-rod will be like the ordinary piston-rod, excepting it be hollow and large enough in proportion to admit the male piston-rod. The
80 male piston-rod is made like the ordinary piston-rod and may be packed and receive the pressure of power through a hole in the center of the piston of the female piston-rod, or it may have equilateral points on its
85 piston end, on which it will run inside the female piston-rod, it will work through a collar or stuffing box on the outer end of the female piston-rod, of proper strength in proportion to the power of the cylinder.
90 To the end of this male piston is attached jaws like those now used, and to which is attached the pitman.

By using this "compound piston-rod" the "dead points" may be overcome in proportion as the male piston-rod is shortened, at the same time also shortening the crank or lever. Example, with six foot cylinders five foot cranks may be used, and the power applied above and below the horizontal line
100 by making the male piston-rods four feet long each; the crank performing a circle of ten feet in diameter, while each female piston-rod works (alternately) six feet, and each male piston rod working four feet of
105 said diameter.

What I claim as my invention and desire to secure by Letters Patent, is—

The combination of two or more "compound piston-rods" working in appropriate
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cylinders, as set forth, with an equal number of cranks arranged on the shaft, to which the power is communicated, the whole being combined, constructed and operating
5 substantially in the manner and for the purposes described. The said "compound piston-rod" being my own invention, but not

claimed for reason of being effective only in a combination of two or more, as herein claimed and set forth.

JOHN R. ST. JOHN.

Witnesses:

B. K. MORSELL,
OWEN MCCUE.