(12) **United States Patent**
Jennings

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(54) **STEAM ENGINE**

(76) Inventor: **Isaiah Jennings**

Isaiah Jennings

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Isaiah Jennings himself of his improvements in the Steam Engine and other Machinery.

First— Construct a common Cylinder with a plange at each end projecting cylindrically about one inch. In this cylinder adjust a piston as usual. A second cylinder must then be formed, large enough to contain or encircle the first. The outer case or cylinder must be distant from each other about one inch, and the former must at both ends be firmly fastened to the outside of the flanges projecting from the latter.

Place one or more of these double cylinders in or over the fire of the furnace so as to permit the piston when in operation to act upon the fire beneath, and cause the flame and heat more regularly to ascend ascend with it— and the smoke to be consumed without escaping from the furnace. The vacant space between the double cylinder receive the water or steam through a pipe which connects the cylinder and boiler. From the vacuum thus formed between the outer and inner cylinder, the steam passes through the usual pipe and enters into the chamber of the inner cylinder on the top of the piston; the steam thus introduced causes the piston to descend and ascend by a regular movement. The working gear attached to the piston may be the same as is used in ordinary steam engines or may be varied at the discretion of the Engineer. The position of the cylinders may also be changed at the pleasure of the constructor; and cylinders disposed in the flues of the furnace will equally serve to circulate the heat. They may also be placed in the furnace without an outer case and worked with a double stroke, according to the common practice. Second construct a boiler to con-

wall of many divisions but communicating with each other by pipes. Each division is formed by two iron plates, two feet square and one quarter of an inch thick. Join the plates by an iron band about one inch and a quarter in width and half an inch thick. The edge of each plate should be somewhat thickened, and then firmly united to the edges of the iron band which is placed between them on all sides, and by retaining them apart forms the necessary division of the boiler. Any number of similar divisions may be united to constitute the boiler, taking care to connect them by pipes formed near the edges. The shape and dimensions of each division may be varied, at the pleasure, and instead of the connecting band, the plates may be united with a space between them of about one inch, by uniting their edges. Each division may be furnished with a spring safety valve, or other may be substituted, and the water may be introduced into the boiler either at the top or elsewhere. Third, I fit the piston very accurately to the cylinder, and keep it tight, forming a ring at the lower edge only of the piston, by a turning lathe, so as to fit close to the circle of the cylinder. Then from one side of the metallic ring cut out a piece of a triangular shape, having its outer edge of the ring, and the base of the triangle directed towards the center. In the opening thus formed fit a spring wedge firmly with its sharp edge against the side of the cylinder. By the pressure of the spring upon the wedge, the latter serves to expand the sides of the ring upon which it acts, and thus by keeping it tight to the inner surface of the cylinder obviates the inconveniences arising from the wear and tear at the outer edge of the ring. The spring wedge is kept fast in its position by corresponding plates placed above and below the center plate, and the center plate has an additional

lineal plate within it, with one straight side to bind the spring wedge, and pressing against it. These when thus united form the lower cylindrical part of the piston.

Seventh. To give greater security to the shafts of steam engines, water wheels from boats, and other machinery, construct a coupling box in the usual form, except the cogs on the face of each half of the box. These must be made to incline somewhat to a point in imitation of a wedge; acting upon the moveable section of the coupling box is a spiral spring fixed around the shaft, and having its opposite extremity resting against a collar, either projecting from the shaft or fixed to it, so as to change its position and if necessary increase or diminish the power of the spring. When the shaft is in motion by the regular power of the engine, the pressure of the spring keeps the boxes united; but if the water wheel or steam boat or other machinery should strike any solid substance and meet with a resistance greater than the power applied, the coupling box by means of the sliding section and spiral spring disunites of itself and will so continue until such resistance ceases, when they again unite by the power of the spring. The peculiar advantages of the preceding improvements consist as follows. First, by placing the pistons and cylinders in the furnace, the fire does not heat the brass and keep the steam more readily; It causes the fire to burn more briskly; consumes the smoke, and also saves fuel. — — — — —

Secondly the boilers with straight sides are stronger, more secure and more easily made. Thirdly, the metallic ring with the spring wedge, is more simple and cheaper than any other, and answers better for packing of pistons. Fourth The coupling box with its spring and slides, prevents the shafts and machinery from be-

ing

hing, when any sudden shock or violent resistance is encountered; for the same reason the machinery may be made much lighter than with the hay used in common, on account of their advantage therefore. Reclaim the exclusive privilege, and so far as for the four preceding improvements, securing to me the sole right of constructing, using and vending the same.

P. M. B. Scoggs Benant }
G. W. Bigelow F. Moore } witnesses David Hennings

DRAFTSMAN'S DIVISION.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

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DEPARTMENT OF THE INTERIOR,

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SIR:

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Mar 15 1825

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