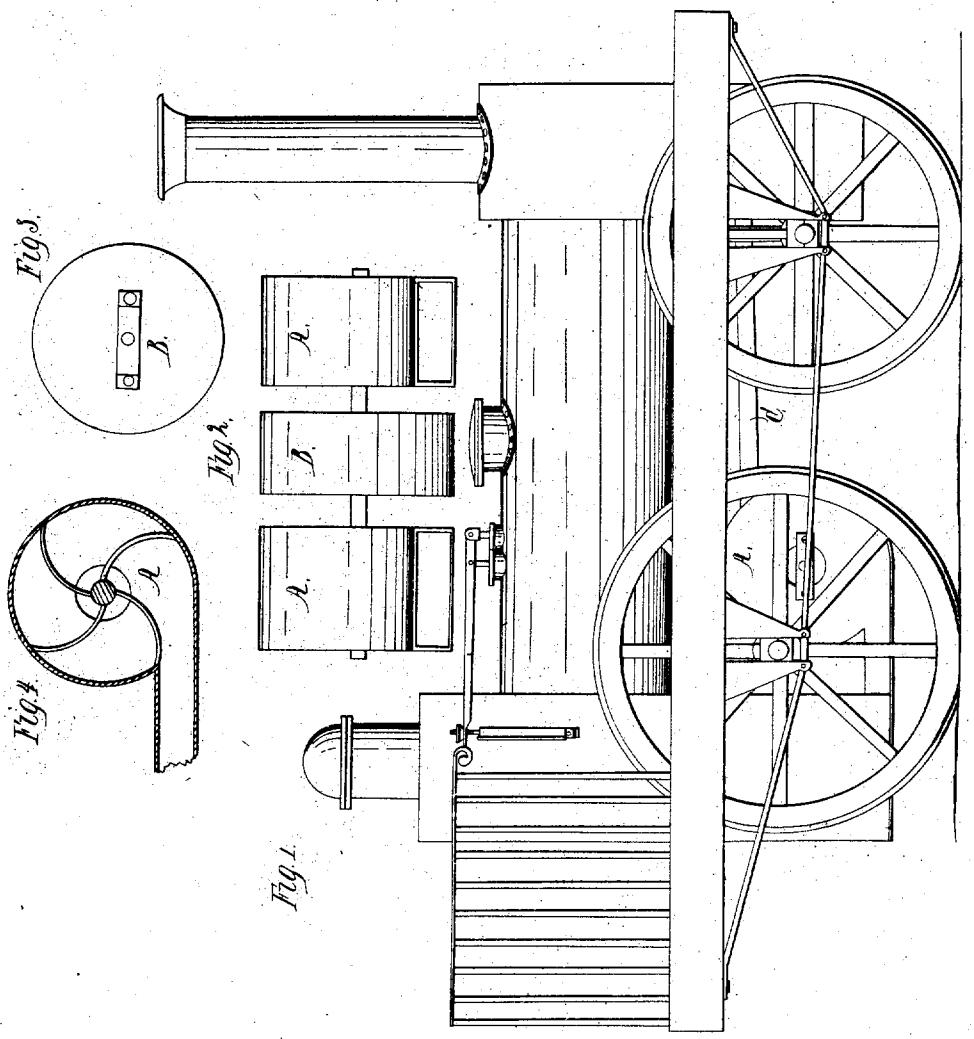
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P. Daris,

Steam-Boiler Furnace,

Patented July 29 1834.



7/29/1834 8331X

July 29 1834 65.

Phineas Davis Baltimore Maryland

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Letters Patent July 29. 1834

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Phineas Davis himself of his improvement in the mode of promoting the combustion of Anthracite coal and other fuel in the furnaces of locomotive & other Steam Engines

Be it known to whomsoever it may concern that I Phineas Davis of Baltimore in the State of Maryland have invented a new mode of promoting the combustion of anthracite and other fuel in the furnaces or fire places of Locomotive and other Steam Engines; and that the following is a full and exact description of my said invention.

The means by which I promote the combustion of the Anthracite and other fuel is by the employment of fan wheels or blowing machines of any ordinary construction well known as machines and my improvement consists in the arrangement of the apparatus by which I employ the steam or escape steam to give motion to such fans or vanes. In a locomotive engine I usually employ two fan wheels and I have found them and their appendages to answer well in practice when made of the dimensions I am about to indicate although in this particular there may be considerable variation without injury to the effect. The wheels may be from 15 to 20 inches in diameter and from 10 to 12 inches wide they may be placed upon the same axis and at the distance of about 8 inches from each other in the clear the blowing machines the vanes of each wheel will be sufficient, but a greater number may be used the number with which the wheels need not differ from those ordinarily employed in such blowing machines. The wind is conducted from these blowing through tubes eight inches square which lead from them in the direction of a tangent to the circle described by the wheels into a tight ash pit under the grate of the furnace and the air by these vanes through the fuel with such velocity as to cause the fire to burn with great energy so as to produce an abundant supply of steam

from an Obstacle notwithstanding the tendency of that fluid to back and thereby to impede the working of such other employed for that purpose in order to give motion to the fan wheel I place a steam wheel upon the same shaft with them generally at the centre through so as to be equidistant from them. This steam wheel is constructed in the same manner nearly as the former wheels differing from them principally in its dimensions and its being acted upon and impelled by an elastic fluid (steam) whilst they act upon and impelle air elastic fluid (air) The steam wheel has usually from rings or tires of from three to five inches in breadth, and it may be from 2 to 24 inches in diameter The wheel is inclosed with a chamber of such dimensions as just to allow the vanes to move freely within it, A tube connected with the exhaust pipe from each end of the Cylinder enters thereby downe tangently and the waste steame is thus injected forcibly against the extreme ends of the vanes impelling them and consequently the wind wheels with great velocity. The steam wheel chamber contains escapes at certain openings or openings in the centre of the chamber made similar to those at which the air enters from the exterior of each to supply the fan wheels

As it is necessary to command the blast so as to regulate the intensity of the fire which would often be too great were the whole of the waste steame discharged upon the steame wheel I attach a branch pipe to that which conducts the steame from the Cylinder or Cylinders to the steame wheel and employ a valve so arranged as to enable me to direct the whole or any certain portion of the steame through such branch pipe and thus obtain the required effect in the most perfect manner the continuance of the supply of steame and the diminished centrifugal force of the wheel has acted upon the vanes combine however to operate under the moment of the escape at the opening surrounding the centre the vanes the pans are properly proportioned to each other although they are always diminished relative to the actual velocity of the vanes as the centre is approached.

The opening in the steame wheel for the escape of steame

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especially make on one side only and cover this with a cap or dome and from this cap or dome a tube extend upwards to carry off the steam in such a way that no inconvenience may be experienced by its discharge. Although I intend always to use the waste steam from the cylinders as I say it is manifest that steam may be supplied from the boiler to act upon the steam wheel but this proceeding would not be economical and would yet be a manifest violation of my rights, I am aware that wind wheels such as I have described have been used to supply a blast to the furnaces of locomotive engines I am also aware that wheels have been propelled by the action of steam upon rings or bands surrounding them I do not therefore claim either of these singly and separately as my invention but what I do claim is the combination and arrangement of the parts whether as I have described by which the waste or escape steam is made to act upon the air receiving within a dome for the purpose of giving motion to wind wheels to feed the furnaces of steam engines, And I do hereby declare that I have herein explained and described what I believe to be the best method of applying the waste steam to accomplish the proposed object but that I do not intend thereby to confine myself to this precise mode of construction and arrangement but to vary the same as I may find convenient whilst I operate upon the same principle and attain it like and by analagous means.

Witnesses

William Harfield — Thomas Davis

John A Brown

Drawing

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Engd. H.G.