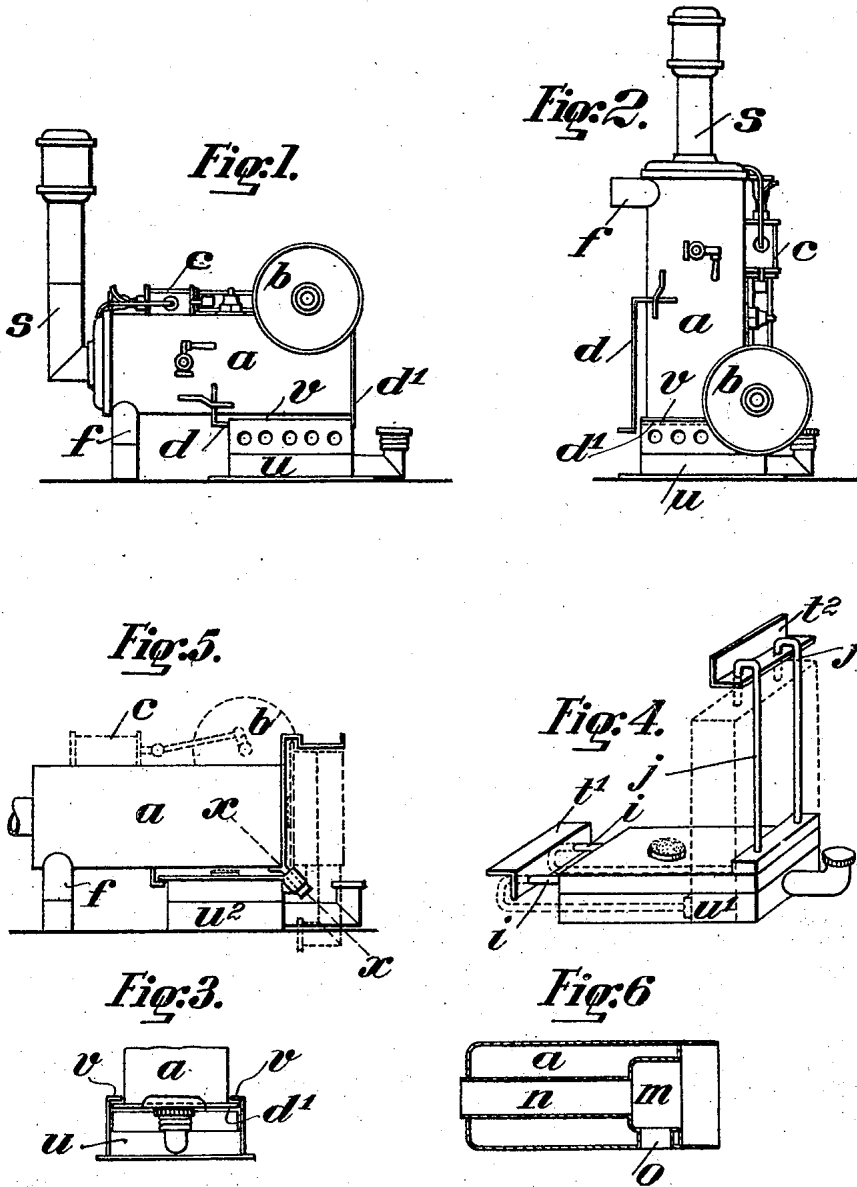


E. FRIZ.
 TOY STEAM ENGINE.
 APPLICATION FILED MAR. 13, 1920.

1,413,218.

Patented Apr. 18, 1922.



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Specification of Letters Patent. Patented Apr. 18, 1922.

Application filed March 13, 1920. Serial No. 365,678.

To all whom it may concern:

Be it known that I, EMIL FRIZ, a citizen of the German Republic, and residing in Goppingen, Germany, have invented certain new and useful Improvements in a Toy Steam Engine, of which the following is a statement.

The present invention relates to a toy steam-engine with boiler, which shall be employed either in a horizontal or in a vertical position; in the former case the engine will resemble a portable engine, in the latter a stationary engine, and will afford the possibility of coupling it with other working models. The feature of the invention consists in the furnace, which may be a common spirit heater, being so arranged, that it can be fitted to the boiler either at the one end (when the engine is in a vertical position or to the side of the boiler, (when the engine is in a horizontal position). At the same time this furnace will serve as a base for the engine.

In the accompanying drawing the present invention is exemplified in various constructional forms.

Figs. 1 and 3 and the detail shown in Fig. 3 show a constructional form, in which the furnace base is arranged to slide in beneath the boiler.

Figs. 4 and 5 show two forms of the invention with the base arranged to be hung onto the boiler or pivoted thereto, respectively.

Fig. 6 is a longitudinal section through the boiler with a boiler tube arrangement.

Fig. 1 shows the engine according to the present invention of a horizontal type, resembling a portable or semi-portable engine. The heating lamp base u forms a stand for the body of the boiler a , the fly-wheel bearing b and the cylinder c with the other accessories. f is an auxiliary stand. The stack s is fitted, as usual, to the boiler by means of an elbow and interchangeable.

d and d^1 in Figs. 1 and 2 are strips of sheet metal (see also Fig. 3) over which the flanges v of the base u engage, when the latter is slid in beneath the boiler from one end of the same. In such position the base is securely held and will serve to heat the boiler a in its horizontal position from below.

When the boiler is to be used in a vertical position, Fig. 2, it is only necessary to draw out the furnace base u from the strips d and

to slide it onto the strips d^1 (Fig. 2) provided at the end of the boiler. Also in such position the furnace will serve as a base for the now vertical boiler with the engine parts. In place of the elbowed stack now a straight stack will be used.

The means for guiding the slidable furnace base u on the end or bottom of the boiler may also be different from those hereinbefore described, so long as it is possible to exchange the base from the one position to the other. If desirable the guide, not in use, may be covered by a sliding lid.

Preferably the boiler is constructed according to Fig. 6. In this case a central boiler tube n extends from the furnace chamber m at the rear, through which a tube o passes entering at m . With this arrangement the heating is equally effective from the end, when the boiler is in a vertical position, or from the bottom, when the boiler is in a horizontal position, the inner heating surface chiefly producing the vaporization of the water.

Fig. 4 is a perspective view of a modified form of the arrangement, the full lines indicating the one and the dotted lines the other position. To the boiler are fitted angle strips t^1 , t^2 ; in these pairs of holes are provided, into which engage pins i and j , respectively fitted to the furnace base, whereby the said base is hung to the boiler. By turning it through an angle of 90° the base may be fitted in the position indicated by dotted lines, so that the boiler may be either used in a horizontal or in a vertical position.

Fig. 5 illustrates another modification of the invention. Here the furnace base u^2 is hinged to the boiler a , the axis of said hinge being $x-x$ at the diagonal corner of the boiler end. This axis is at an angle of 45° to the horizontal, and therefore allows of rocking the base u^2 from the one position for the horizontal boiler into the other position, indicated by dotted lines, for the vertical boiler. During such rocking movement the base travels through a cone around the axis $x-x$, for which purpose space need only be provided at the one side of the boiler.

The hereinbefore described exchangeability of the furnace base may also be employed with other working models and in general with small steam boilers.

I claim:

1. A toy steam engine adapted for use

in a vertical or a horizontal position, comprising in combination a furnace base, a boiler, a bottom plate at one end of the said boiler and side flanges on the said boiler on which the furnace base is adapted to slide.

5 2. A toy steam engine adapted for use in a vertical or a horizontal position, comprising in combination a furnace base, a boiler and end and side flanges on the said boiler on which the furnace base is adapted to slide.

10 3. A toy steam engine adapted for use in a vertical or a horizontal position, comprising in combination a furnace base fitted with pins and a boiler provided at one end and

15 at its under side with angle edges having

holes in which the pins are adapted to engage.

4. A toy steam engine adapted for use in a vertical or a horizontal position, comprising in combination a furnace base and a boiler connected by an inclined hinge axis whereby the boiler may be swung into either of its respective positions.

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In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

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EMIL FRIZ.

Witnesses:

CHRISTIAN EBERHARD,
ALBERT FRAYS.