

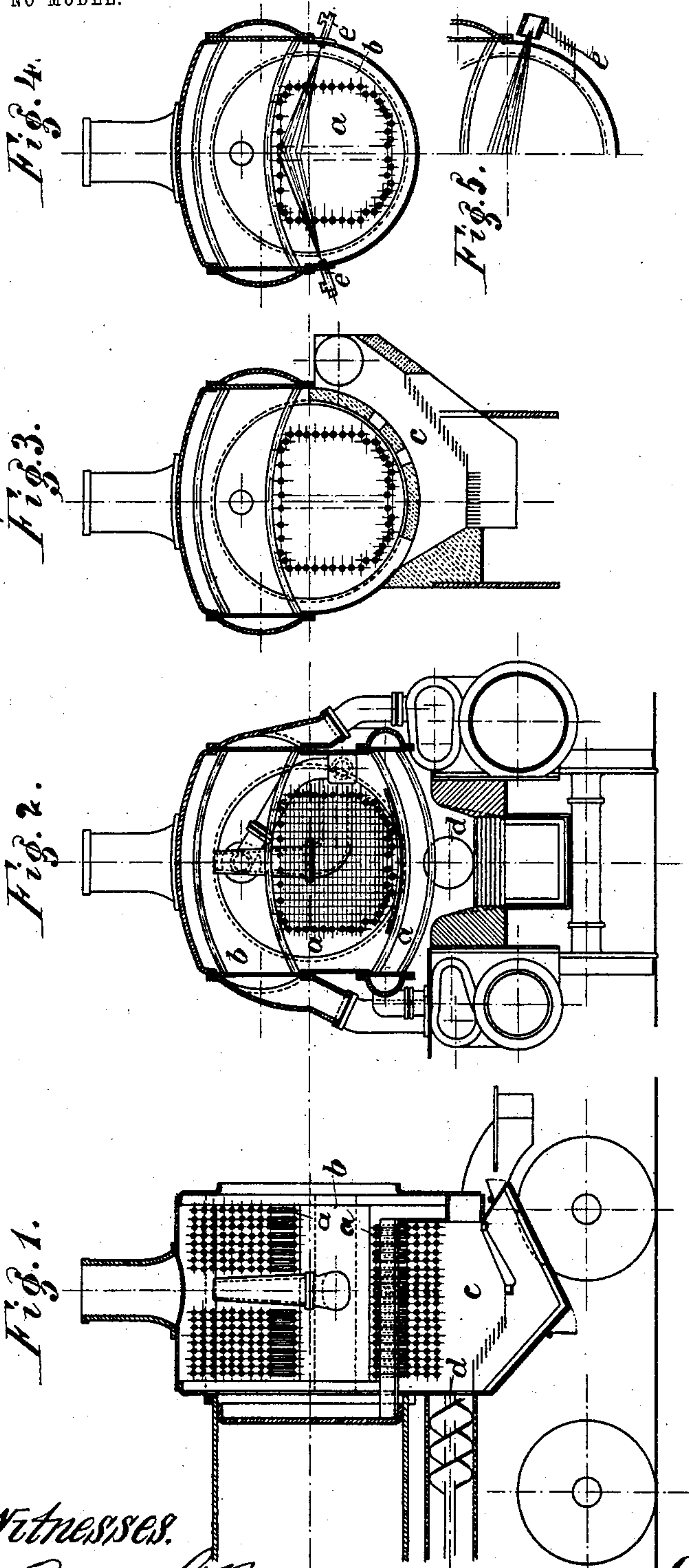
No. 771,630.

PATENTED OCT. 4, 1904.

C. HAGANS.  
SUPERHEATER.

APPLICATION FILED MAR. 24, 1904.

NO MODEL.



Witnesses.

James L. Norris, Jr.  
Robert Couett.

Inventor.  
Christian Hagans.  
By James L. Norris.  
Atty.

# UNITED STATES PATENT OFFICE.

CHRISTIAN HAGANS, OF ERFURT, GERMANY.

## SUPERHEATER.

SPECIFICATION forming part of Letters Patent No. 771,630, dated October 4, 1904.

Application filed March 24, 1904. Serial No. 199,853. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN HAGANS, manufacturer, a subject of the King of Prussia, Emperor of Germany, residing at Erfurt, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Superheaters for Locomotives, of which the following is a specification.

My invention relates to improvements in superheaters for locomotives; and it has for its object to construct a superheater in the smoke-box of locomotive-engines in which for the purpose of increasing the temperature of the heating-gases a separate furnace is arranged within or at the side of the smoke-box. This furnace serves partly or wholly for heating the superheater.

Referring to the drawings forming a part of this specification, in which is shown several forms of the arrangement of the superheater in connection with a furnace for heating it, said arrangement being in accordance with this invention, Figure 1 is a longitudinal section of the smoke-box of a locomotive, showing the superheater and the furnace for heating it. Fig. 2 is a horizontal section of Fig. 1. Fig. 3 is a horizontal section of a modified arrangement. Fig. 4 is a similar view of a modification, and Fig. 5 is a detail of the arrangement of Fig. 4.

In the form of construction illustrated by Figs. 1 and 2 the superheater *a*, which is arranged in the smoke-box *b*, is subsidiarily heated by a separate furnace *c*, placed underneath the smoke-box *b*, which can be fed with fuel from the engine-driver's foot-plate in any suitable manner—for instance, by means of a helical conveyer *d*.

Fig. 3 differs from the arrangement illustrated by Figs. 1 and 2 as regards the arrangement of the separate furnace *c*, inasmuch as the latter is arranged at the side of and not underneath the smoke-box.

Figs. 4 and 5 illustrate an arrangement for burning liquid or gasiform fuel, which is conveyed in a suitable manner to the superheater *a* in the smoke-box *b*. The delivery-nozzles *e* may be arranged on one or both sides of the smoke-box or in any other suitable manner.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination with the smoke-box of a locomotive, of a superheater arranged therein, and means independent of the fire-box of the locomotive for heating said superheater.

2. The combination with the smoke-box of a locomotive, of a superheater arranged therein, and a furnace independent of the fire-box of the locomotive for heating said superheater.

3. The combination with the smoke-box of a locomotive, of a superheater arranged therein, and a furnace arranged exteriorly of the smoke-box and independent of the fire-box of the locomotive for heating the superheater.

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

CHRISTIAN HAGANS.

Witnesses:

AUGUST FRANKE,  
WILHELM MONDOCKEUR.