

Blakslee & Manser,
Steam-Boiler Water-Heater.
N^o 50,327. Patented Oct. 10, 1865.

Fig. 2

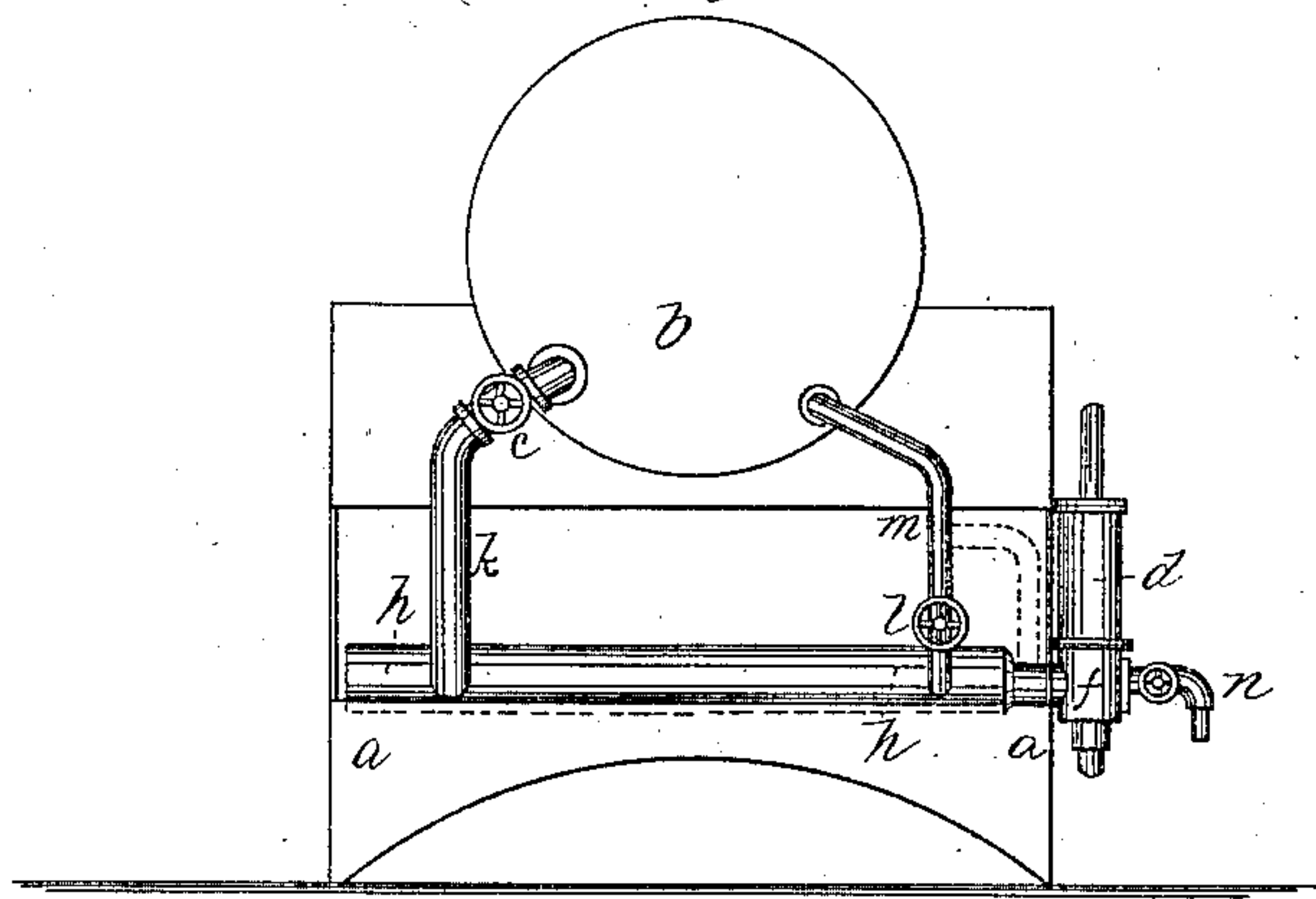
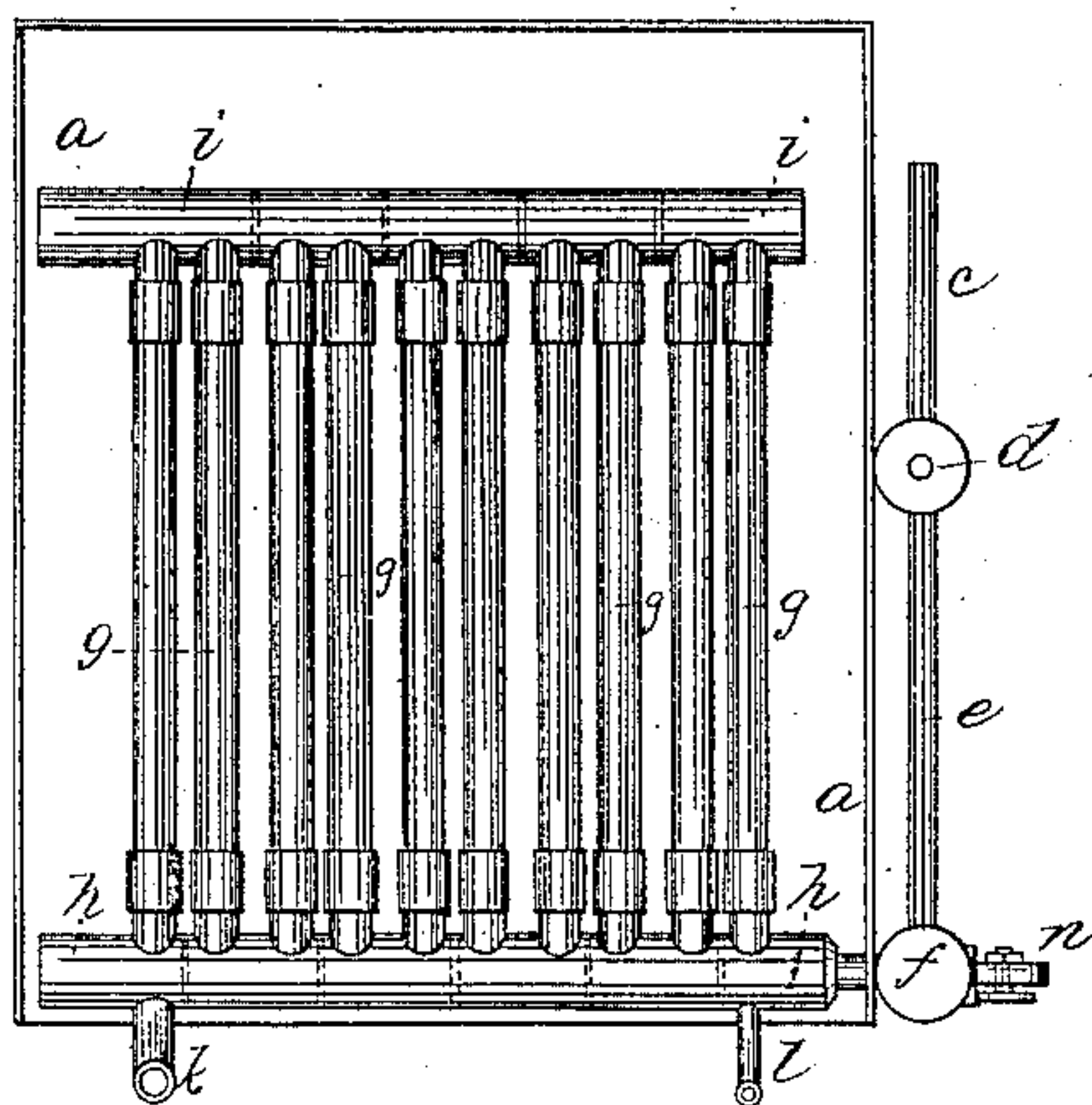


Fig. 1



Witnesses:

Malcolm Smith
Lemuel W. Lovell

Inventors:

Ebenezer G. Blakslee
Alfred Manser

UNITED STATES PATENT OFFICE.

E. G. BLAKSLEE AND A. MANSER, OF SING SING, NEW YORK.

IMPROVEMENT IN GRATE-BARS FOR STEAM-GENERATORS.

Specification forming part of Letters Patent No. 50,327, dated October 10, 1865.

To all whom it may concern:

Be it known that we, EBENEZER G. BLAKSLEE and ALFRED MANSER, of Sing Sing, in the county of Westchester and State of New York, have invented and made a certain new and useful Improved Feed-Water Heater for Boilers, Furnaces, and Steam-Generators; and we do hereby declare the following to be a full, clear, and exact description of our said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a sectional plan of a furnace containing our improvement, and Fig. 2 is an elevation of the same.

Similar marks of reference denote the same parts.

The nature of our said invention consists in an arrangement of feed-water pipes, in combination with hollow or tubular grate-bars, whereby the feed-water is pumped through the grate-bars in its passage to the boiler, so as to become fully heated before it reaches said boiler, and when the supply of water is shut off a circulation is maintained of water from the boiler through said tubular grate-bars.

In the drawings, *a* represents the outline of a fire-box of any desired character; *b*, a portion of the boiler; *c*, the pipe supplying water to the feed-pump *d*; *e*, the pipe from said pump to the check-valve *f*, which parts, being well known, need no further description.

g g are tubes forming grate-bars. These are connected at their ends to the pipes *h* and *i* by means of sleeves or couplings that allow of expansion or contraction, but remain water-tight. The tubes *h* and *i* are formed with partitions, as shown by dotted lines, so that the feed-water as passed into one end of the pipe *h* is compelled to travel through the entire range of grate-bar tubes alternately backward and forward, as indicated by the blue arrows,

and passes through the pipe *k* into the boiler in a highly-heated state. When the water in the boiler is high enough, and the feed-water stopped, the cock *l* in the pipe *m* is to be opened, when a circulation of water will take place from the lower part of the boiler *b* through the range of hollow grate-bars in the same direction as the feed-water traveled in passing into the water, and by this arrangement the grate-bars will be kept cooler, and the heat conveyed directly from them into the boiler.

n is a cock that may be used as a "blow-off" when required to empty or partially discharge the contents of the boiler, and *o* is a cock or valve in the pipe *k* that may be provided for shutting off water from the grate-bars, if required.

A pipe may be provided, as shown by dotted lines in Fig. 2, passing from the check-valve case to the pipe *m* above the stop-cock *l*, so that water could be passed directly into the boiler if so required.

Ordinary grate-bars may be employed in addition to the tubes *g*, in which case the said tubes *g* might be at the sides of the furnace, the heating of the feed-water and the circulation when shut off being the same as before set forth.

What we claim, and desire to secure by Letters Patent, is—

The tubular water-heaters *g*, in combination with the pipes *k* and *m* and feed-water pipe *e*, arranged and operating substantially as specified.

In witness whereof we have hereunto set our signatures this 8th of April, 1865.

E. G. BLAKSLEE.
ALFRED MANSER.

Witnesses:

J. MALCOLM SMITH,
LEMUEL W. SERRELL.