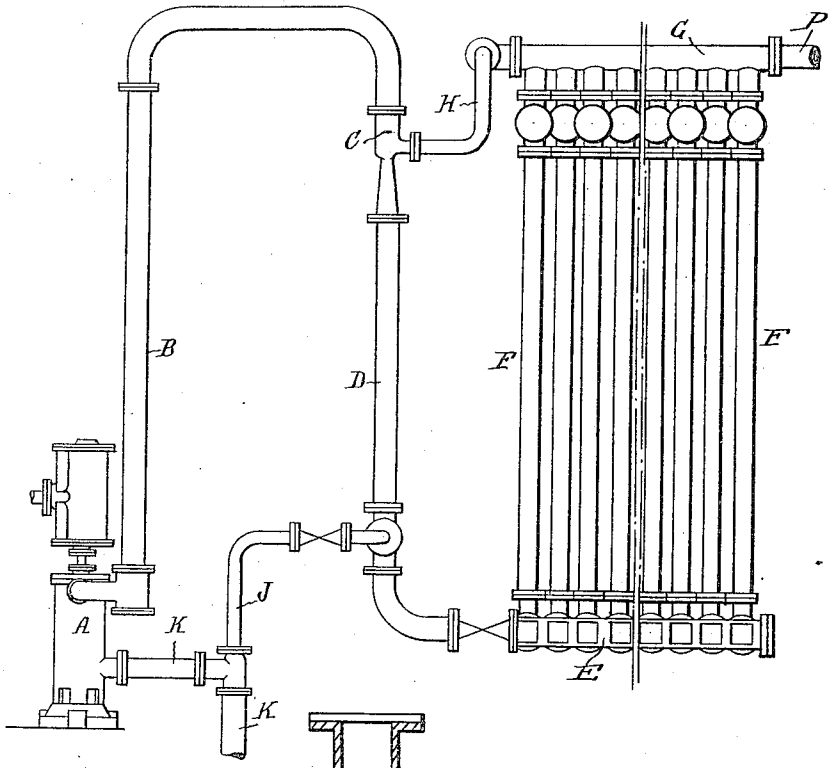
E. G. HILLER.

FEED WATER CIRCULATING ARRANGEMENT FOR ECONOMIZERS.

APPLICATION FILED JUNE 10, 1916.

1,223,976. Patented Apr. 24, 1917.

Fig. 1.



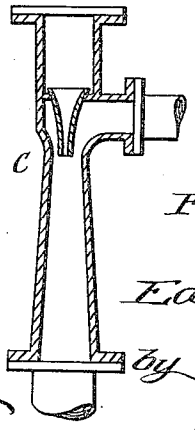


Fig. 2.

Witnesses:

M. E. McDade.

C. L. Dealer

Inventor

Edward G. Hiller

by James L. Norris,

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD GEORGE HILLER, OF MANCHESTER, ENGLAND.

FEED-WATER-CIRCULATING ARRANGEMENT FOR ECONOMIZERS.

1,223,976. Specification of Letters Patent. Patented Apr. 24, 1917.

Application filed June 10, 1916. Serial No. 102,985.

To all whom it may concern:

Be it known that I, EDWARD GEORGE HILLER, a subject of the King of Great Britain, residing at Manchester, Lancashire, England, have invented a new and useful Improvement in Feed-Water-Circulating Arrangements for Economizers, of which the following is a specification.

This invention relates to feed water circulating arrangements for economizers of the type known as "Green's."

It is found that feed water delivered to an economizer at a temperature below 100° F. has the effect of causing the flue gases to condense on the external surfaces of the economizer pipes, thereby setting up a process of rapid wasting of the pipes which soon involves the owners in costly pipe renewals. Moreover, corrosion of pipes arising from contact with damp brickwork progresses more rapidly when the temperature of the feed water at the inlet end of the economizer is low, *i. e.*, below 100° F. For these reasons, it is desirable to raise the temperature of the feed water before it enters the economizer. Various ways of raising the temperature of the feed water have been proposed and tried, and my invention consists in a novel arrangement for accomplishing this end in a practical manner which insures certainty of action, economy in working, and an even distribution of heat.

In the accompanying drawing, which illustrates my invention:—

Figure 1 is a diagrammatic view of the complete apparatus; and

Fig. 2 is a central vertical section on a greatly enlarged scale, of the injector included in the apparatus.

A is the feed pump which delivers feed water through the pipe B to an injector C and thence by a pipe D to the bottom inlet pipe E of the economizer F. G is the outlet pipe from the economizer which delivers the hot water to the boiler through a delivery pipe P. The suction inlet of the injector C is connected by a branch pipe H to the pipe G. A branch pipe J leads from the pipe D to the suction pipe K of the pump. This branch pipe is free or uncontrolled when in use.

The action is as follows:—The feed water passing through the injector serves to draw a portion of the hot water from the outlet pipe G of the economizer, and this hot water mixes with the cold feed and raises the temperature of the latter. Some of this mixture is drawn out of the pipe D through the branch pipe J into the suction pipe K by the action of the pump and there mixes with the cold feed entering the pump. The remaining part of the mixture enters the economizer through the pipe E. It will be seen therefore that there is a circulation of water through the pump and injector and back to the pump, and a further circulation of water through the economizer and injector and back to the economizer.

By this arrangement, the feed water is considerably heated before it enters the economizer, and the action of the injector is made more positive or certain by reason of the suction exerted by the pump through the branch pipe J. The action of my improved apparatus is not easily arrested by friction in the pipes or by obstructions due to bends in the pipes, and the apparatus therefore can be relied upon to continue its working when properly started; it moreover secures the withdrawal of a sufficiency of hot water from the top of the economizer to insure the delivery of feed into the bottom of the economizer at a temperature high enough to avoid the evils hereinabove mentioned.

I claim:

The combination, of a multiple-pipe, a feed water heater or economizer, an injector having its suction inlet connected to the outlet end of the economizer and its outlet to the inlet end of the economizer, a feed water pump having its delivery pipe connected to the injector so as to discharge the feed water through the injector, a suction or water supply pipe for the pump, and a free or uncontrolled branch pipe leading from the delivery pipe of the injector to the said suction pipe of the pump, substantially as described.

EDWARD GEORGE HILLER.

Witnesses:
F. W. STOTT,
ARTHUR CHEETHAM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."