

No. 736,793.

PATENTED AUG. 18, 1903.

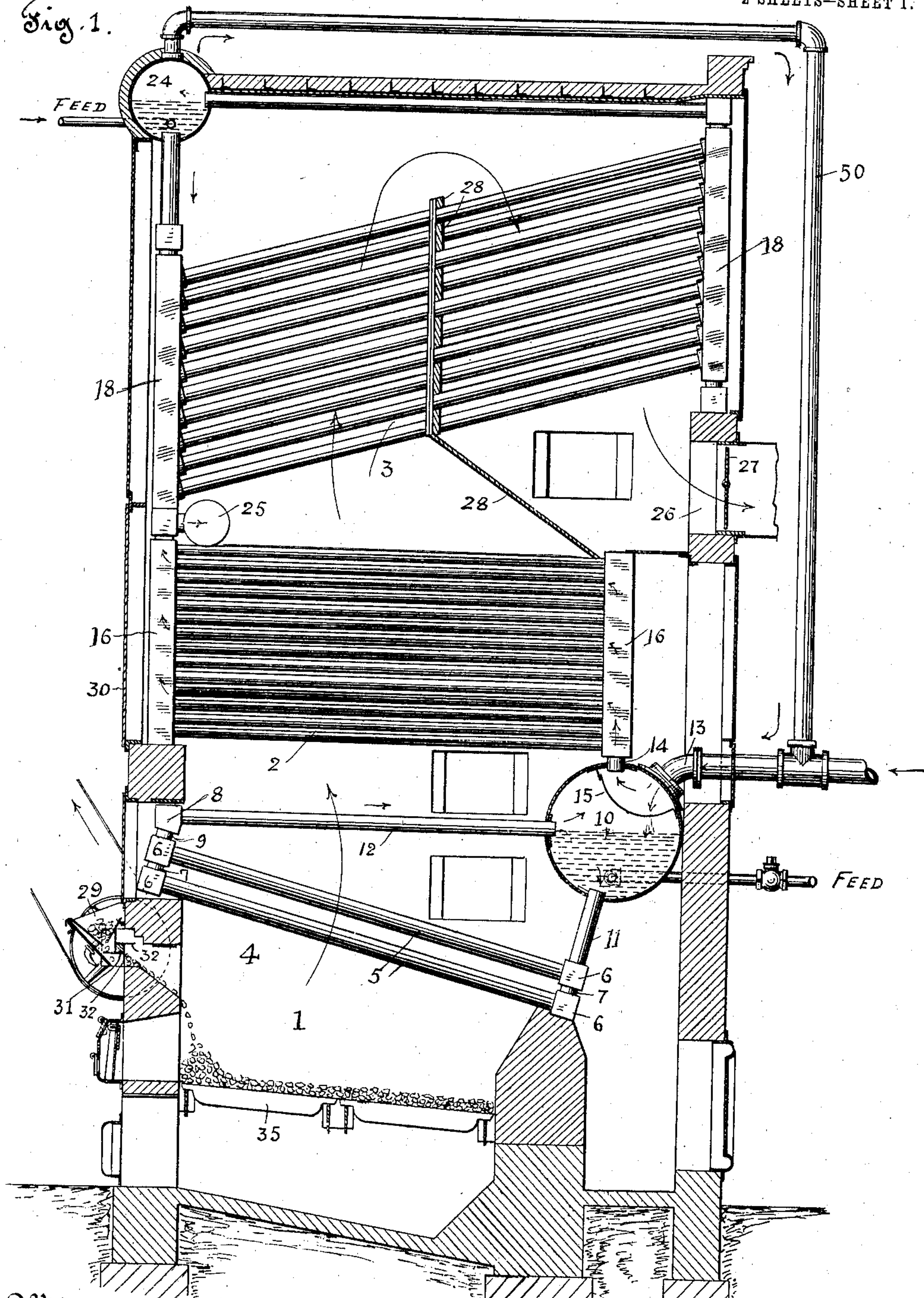
M. W. SEWALL.
SUPERHEATING APPARATUS.

APPLICATION FILED JUNE 6, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Charles Hanemann
Samuel L. Sargent

M. W. Sewall Inventor
By *His* Attorney
Chas. M. Parker

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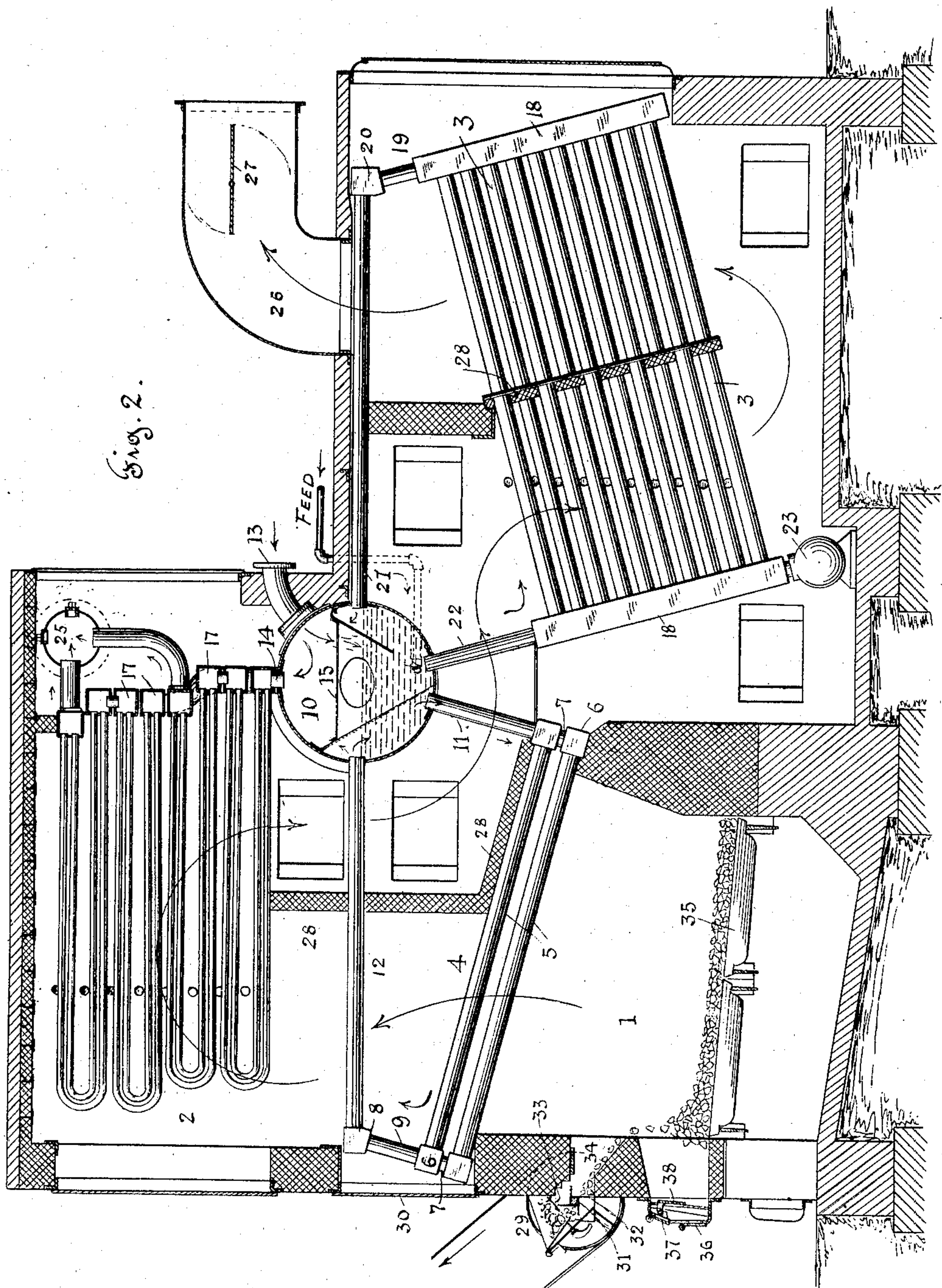
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2 SHEETS—SHEET 2.



Witnesses
Charles Kanimann
Samuel L. Sargent

M. W. Sewall, Inventor
By *Li* Attorney
Ray W. Forbes

UNITED STATES PATENT OFFICE.

MINOTT W. SEWALL, OF ROSELLE, NEW JERSEY.

SUPERHEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 736,793, dated August 18, 1903.

Application filed June 6, 1902. Serial No. 110,475. (No model.)

To all whom it may concern:

Be it known that I, MINOTT W. SEWALL, a citizen of the United States, residing at Roselle, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Separately-Fired Superheating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a separately-fired steam-superheater; and it consists, in combination therewith, of an attemperator arranged between the furnace and the superheater for the purpose of modifying the direct heat of the furnace upon the superheating-surfaces, a separator connected with the steam-supply, and an economizer located in the path of the escaping products of combustion for reëvaporating any entrained water in the steam from the generator.

In the accompanying drawings an apparatus embodying my invention is shown detached from a steam-generator.

Figure 1 represents a side view with the economizer arranged above the superheater in the same vertical plane, and Fig. 2 a side view with the economizer located on a horizontal plane with the furnace and attemperator.

In the respective views similar numerals of reference indicate corresponding parts.

1 is the furnace, 2 the superheater, and 3 the economizer.

4 is the attemperator, located between the furnace 1 and the superheater in the line of the course of the heated gases from the furnace, as shown. The attemperator is composed of two or more series of water-tubes 5, arranged across the top of the furnace and connected at their opposite ends to manifolds or water-boxes 6, which communicate by means of a series of interposed nipples 7, the upper manifold connecting with another manifold 8 at the front by means of a series of tubes 9 and at the rear to the steam and water drum 10 by a series of tubes 11. The drum 10 and front manifold 8 communicate through the series of tubes 12. This construction constitutes the water circulation within the attemperator. The steam-space of the drum 10 communicates directly with a steam-generator (not shown) through the pipe connection 13 and with the superheater by means

of a series of tubes or nipples 14. The interior of the drum 10 is provided with perforated partitions or baffles 15 to keep the circulating water in the drum practically separated from the steam-space and from the steam-inlet from the generator and steam-exit to the superheater.

The superheater may be of any known type, Fig. 1 showing a superheater composed of a group of horizontal tubes connected to headers 16, and Fig. 2 a superheater made up of a series of return-bend tubes connected to a tier of boxes 17.

The economizer 3 (shown in Fig. 2) is composed of a group of inclined tubes connected to headers 18, which communicate with a series of tubes 19 and cross-box 20 at one end and with tubes 21 from said cross-box with the drum 10. The headers at the other end of the economizer communicate directly with the drum 10 through a series of tubes 22. A mud-drum 23 is also provided at the lower end of the economizer. The water circulation of the economizer is the same as through the attemperator, as indicated by the arrows in the respective figures. In the relative arrangement of the economizer shown in Fig. 1 a separate drum 24 is supplied.

The steam-outlet of the superheater is indicated by the numeral 25 in the respective figures.

The course of the heated gases from the furnace to the chimney or uptake is clearly indicated by the curved arrows. The uptake 26 is supplied with a damper 27, and the course of the gases is regulated by the partitions or baffles 28 in the usual way.

In the construction of the attemperator only two rows of the tubes 5 are used, which are deemed sufficient for the purpose of this invention, this surface not being intended as a heating-surface for the generation of a steam-supply to the superheater, its proportion to the amount of grate-surface shown rendering it inadequate for such purposes, the superheating-surface being designed approximately in a ratio of five to one of a steam-generating surface.

The superheater 2 on account of its large comparative size will with the ordinary means of firing be sensitive to the flooding of the furnace with cold air during the pe-

riod of working the fire, and to avoid this I have added devices to prevent the entrance of the air at such time. These devices consist of a hopper 29, through which the coal is fed, located below the connection-door 30 of the superheater, as shown in Fig. 1, or of the attemperator, as shown in Fig. 2. The hopper is provided near its base with a revolving feeder 31, having projecting blades 32 and a swinging gate 33, operated by the revolving feeder to close the base of the hopper during the feeding of the coal to the chute 34, leading to the furnace. The gate 33 above the feeder also serves to distribute the coal as the feeder revolves, and thus keeps the coal from lodging in the hopper. With this device the coal will be fed continuously and after coking at the front of the furnace may be spread over the grate 35 by suitable tools passed through small openings in the furnace-door 36, which are normally closed by hinged coverings 36 37 38. This feeding and fire-regulating device is not claimed herein, but is reserved for the subject-matter of a separate application.

The operation of the apparatus will be readily understood from the foregoing description and inspection of the drawings, the attemperator and economizer being kept supplied with water by suitable feed connections (shown in the drum 10, Figs. 1 and 2) and by an independent or connected feed in the drum of the economizer, as shown in Fig. 1, the circulation following the direction shown

by the small arrows. The steam generated in the economizer as arranged in Fig. 1 is conveyed from the drum 24 through the pipe 50, connecting with the steam-inlet 13.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a separately-fired steam-superheater, the combination therewith of a separator connected with the steam-supply and an attemperator in circulatory communication therewith both located between the furnace and the superheater.

2. In a separately-fired steam-superheater, the combination therewith of a separator connected with the steam-supply, an attemperator in circulatory communication therewith, and an economizer located in the course of the escaping products of combustion.

3. In a separately-fired steam-superheater, the combination therewith of a separator connected with the steam-supply, an attemperator in circulatory communication with the separator and an economizer also in circulatory communication with the separator, all located in the course of the escaping products of combustion.

In testimony whereof I affix my signature in presence of two witnesses.

MINOTT W. SEWALL.

Witnesses:

CHAS. W. FORBES,
CHARLES HANIMANN.