

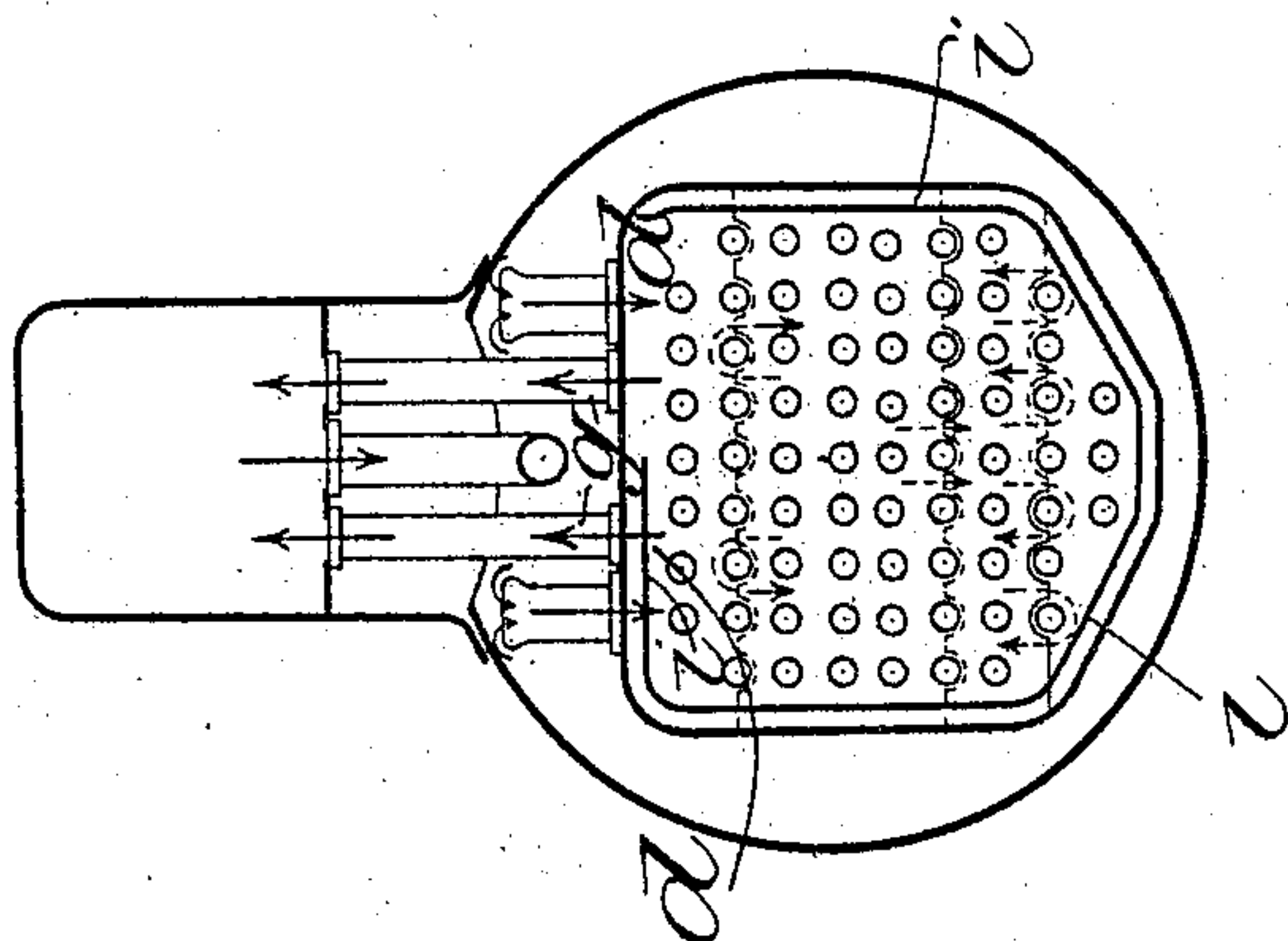
No. 764,625.

PATENTED JULY 12, 1904.

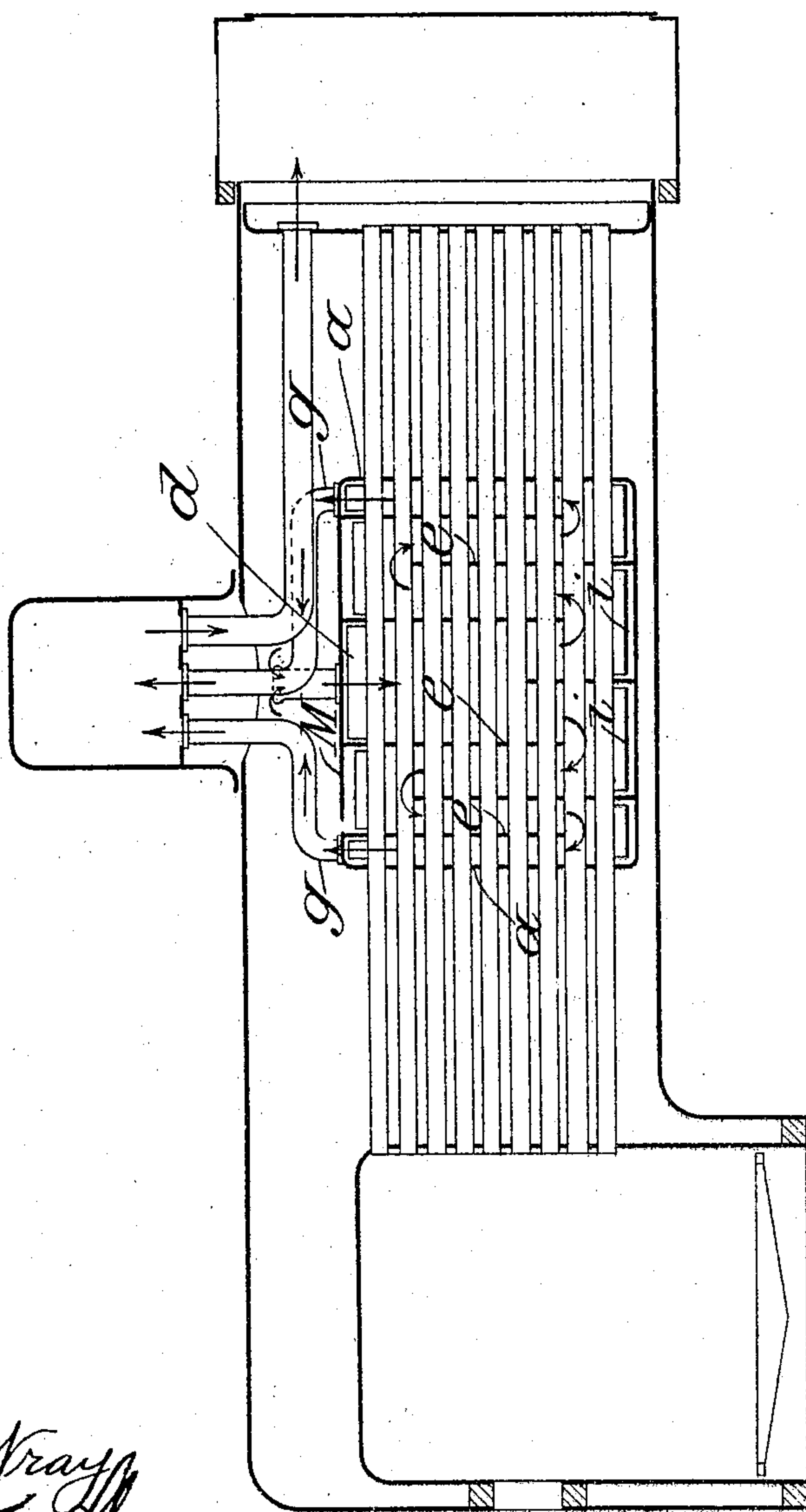
E. PIELOCK.  
STEAM SUPERHEATER.  
APPLICATION FILED SEPT. 13, 1902.

NO MODEL.

*fig. 2.*



*fig. 1.*



Witnesses.

*Edward J. Wray*  
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by

# UNITED STATES PATENT OFFICE.

EDUARD PIELOCK, OF BERLIN, GERMANY.

## STEAM-SUPERHEATER.

SPECIFICATION forming part of Letters Patent No. 764,625, dated July 12, 1904.

Application filed September 13, 1902. Serial No. 123,229. (No model.)

*To all whom it may concern:*

Be it known that I, EDUARD PIELOCK, engineer, a subject of the King of Prussia, German Emperor, residing in Berlin, Prussia, Germany, have invented certain new and useful Improvements in Steam-Superheaters, of which the following is a specification.

My invention relates to improvements in superheaters located in the water-space of the steam-boiler. For the purpose of saving or preserving the heating-walls to a maximum extent it is necessary that the damp steam, which has the lowest temperature, come in contact with that part of the heating-surface which is at the highest temperature, and consequently the hottest steam in contact with the relatively coldest heating-surfaces. The steam of higher temperature, however, must be conducted over the heating-surfaces with a greater velocity. The water surrounding the tubes, however, tends to cool by conduction that portion located in the superheater and this cooling medium. Thus that part of the tubes lying near the middle of the superheater will have a higher temperature than the portion at the tube-plates. The large surfaces of the shell of the box, which only assume the temperature of the boiler-water, are not adapted to promote superheating of the steam. On the contrary, they will unfavorably influence the purpose in view.

My new superheater is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section, and Fig. 2 a cross-section, of the apparatus applied to the boiler.

In my improved superheater the heating-walls are saved or preserved by a combined parallel current and counter-current superheater.

The superheater consists of a box M, which is arranged inside the boiler of any known type in such manner that the boiler-pipes pass through the same. Openings *d* or short tubes are provided at the top of the box M for allowing the steam from the upper part of the boiler to enter the superheater. Inside of the box there are a number of partition-walls arranged in such manner that the partition-walls next to the openings *d* contact with the

top of the superheater and reach down so far as to leave a space of sufficient height to allow the steam to pass below the partition-walls. The next partition-walls contact with the bottom of the superheater and leave a space on top again to allow the steam to pass. Thus the walls are arranged in staggered position, so as to divide the steam into two streams following a zigzag path. The partition-walls divide the box into a number of chambers, of which the center one has the greatest sectional area, while the succeeding chambers decrease in width. The end chambers are connected by two or more pipes *g* with the boiler-dome.

The efficiency of the apparatus is increased by isolating shells or plates *i i*, the temperature of which is raised by the warmer tubes located in immediate proximity.

The steam enters the superheater at *d*, is conducted down and up again by the partition-walls toward either side, increases continually in velocity owing to the decreasing section of the passages, and leaves the superheater heated by the two pipes *g*, whence it is conducted away for use. One part of the steam is superheated in the parallel current, the other in the counter-current.

Having now particularly described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A compound parallel and counter current superheater comprising a box *a* surrounding the fire-tubes of the boiler, divided by partitions *e* whereby a relatively large heating-surface is presented to the steam entering, and a smaller heating-surface to the steam leaving the apparatus, the steam being conducted in such manner that one part is superheated in the parallel current and the other part in the counter-current, substantially as described.

2. A compound parallel and counter current superheater comprising a box *a* surrounding the fire-tubes of the boiler, divided by partitions *e* whereby a relatively large heating-surface is presented to the steam entering, and a smaller heating-surface to the steam leaving the apparatus, and having isolating shells or plates *i* for preventing the steam circulating in the apparatus from being cooled



by contact with the shells of the box *a*, the steam being conducted in such manner that one part is superheated in the parallel current and the other in the counter-current, substantially as described.

3. In a superheater, the combination of a box which surrounds the tubes and is itself surrounded by the water-space of a steam-boiler with partitions which are unevenly distributed in the box so as to present passages of gradually-decreasing cross-section, an inlet for the box where the cross-section is relatively large and exits from the box where the cross-sections are relatively small.

4. In a superheater, the combination of a steam-generator having tubes and a water-space with a box which incloses a portion of said tubes, an opening into the box from the steam-space within the steam-generator, a dis-

charge from the box to the steam exit-way and a channel through said box of gradually-decreasing cross-section toward the exit.

5. In a superheater, the combination of a steam-generator having tubes and a water-space with a box which incloses a portion of said tubes, an opening into the box from the steam-space within the steam-generator, a discharge from the box to the steam exit-way and a channel through said box of gradually-decreasing cross-section toward the exit, said box provided with an interior shell.

Signed at Berlin this 23d day of August, 1902.

EDUARD PIELOCK.

Witnesses:

WOLDEMAR HAUPT,  
WILLIAM MAYNER.