

UNITED STATES PATENT OFFICE.

JAMES MARTIN, OF TORONTO, CANADA, ASSIGNOR TO HIMSELF, AND JAMES E. THOMSON,
OF BUFFALO, NEW YORK.

SUPERHEATING STEAM FOR LOCOMOTIVE-ENGINES.

Specification of Letters Patent No. 30,857, dated December 4, 1860.

To all whom it may concern:

Be it known that I, JAMES MARTIN, of the city of Toronto, Canada, West, mechanical engineer, have invented certain new and
5 useful Improvements in Exhaust-Chambers and Steam-Surchargers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being
10 had to the accompanying drawings and the letters of reference marked thereon, in which—

Figure I, is a transverse section of a locomotive smoke box, in which are placed my improved exhaust chambers, and steam surchargers, shown partly in section and partly
15 in elevation. Fig. II, is a longitudinal section of the same.

Like letters refer to like parts in each of the figures.

20 A, A, are tubular chambers arranged within the smoke box, having a number of flues, R, passing longitudinally through them, the flues R opening at the bottom into the smoke box, and at the top into the pipes or large
25 flues, B, B. These pipes B, B, are connected to the tubular chambers as shown at T. Their upper ends are bent inwardly toward each other, and flattened and elongated, and connected to, and passing nearly around the
30 short cylinder, C, placed within the smoke pipe, and forming by their junction therewith, an annular chamber, S, which opens into the smoke pipe, D, and causes a strong draft through the flues, B, and hence through
35 the lower flues of the boiler.

F, F, are steam pipes branching from the main steam pipe leading from the boiler, and conveying steam from the boiler into the
40 tubular chambers A, in which the steam will fill the spaces between the flues, and become superheated by the flues. From the chambers, A, A, it is conveyed to the steam cylinders of the engine by the pipes, F.

45 G, are the exhaust pipes opening into the smoke box in the usual way.

H, represents the boiler flues.

The operation of my improvement may be described as follows: The exhaust steam as it is discharged from the exhaust pipes G will

cause a strong draft through the chimney; 50 but this draft though it will strongly exhaust those flues of the boiler, which open into the smoke box near the top and center or at the level of the mouths of the exhaust
55 pipes, will only partially exhaust the lower and side flues, and hence without further improvements, the lower flues become more or less choked up, as is well known; but the strong draft through the chimney, made by
60 the exhaust, will cause a vacuum to be formed in the annular chamber S, to fill which vacuum, will cause a strong draft through the flues R, of the chambers A, and the pipes B, B. As these flues open into the
65 smoke box near the bottom and sides thereof, the draft through them will thoroughly exhaust the lower and side flues of the boiler, and thereby keep them free from all obstructions, and allow the flame a free pas-
70 sage. The smoke and hot gases which pass up these flues R will superheat the steam as it circulates in the space around them in the chambers A on its way to the steam cylinders, so that when it passes from the chambers, it
75 will be perfectly dry, and free from moisture. It will thus be seen, that by the use of my improvement, I accomplish several great and important advantages—1st, the increase of the draft through the lower and side flues
80 of the boiler, and, 2d, the superheating of the steam, by the use of the waste smoke and hot gases, which accumulates in the smoke box, or pass out of the smoke pipe; 3d, and as a consequence thereof, an increased power of
85 steam and great economy in the use of fuel.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the flues R with the steam chambers A, for the purposes, and substantially as described. 90

2. The annular chamber S, in combination and arrangement with the steam chambers A flues R, and pipes B for the purposes and substantially as set forth.

JAMES MARTIN.

Witnesses:

E. M. DAVIS,

W. H. FORBUSH.