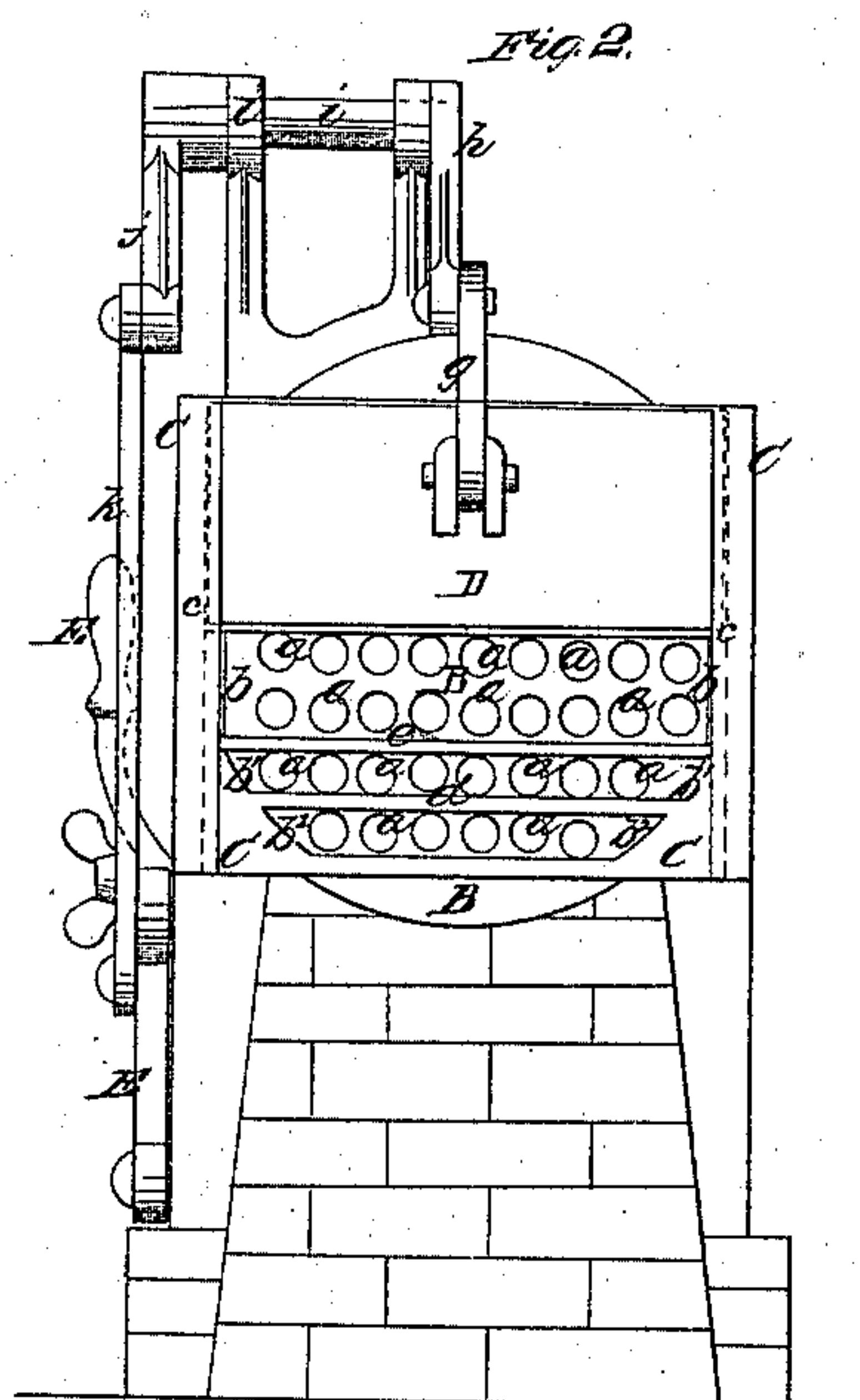
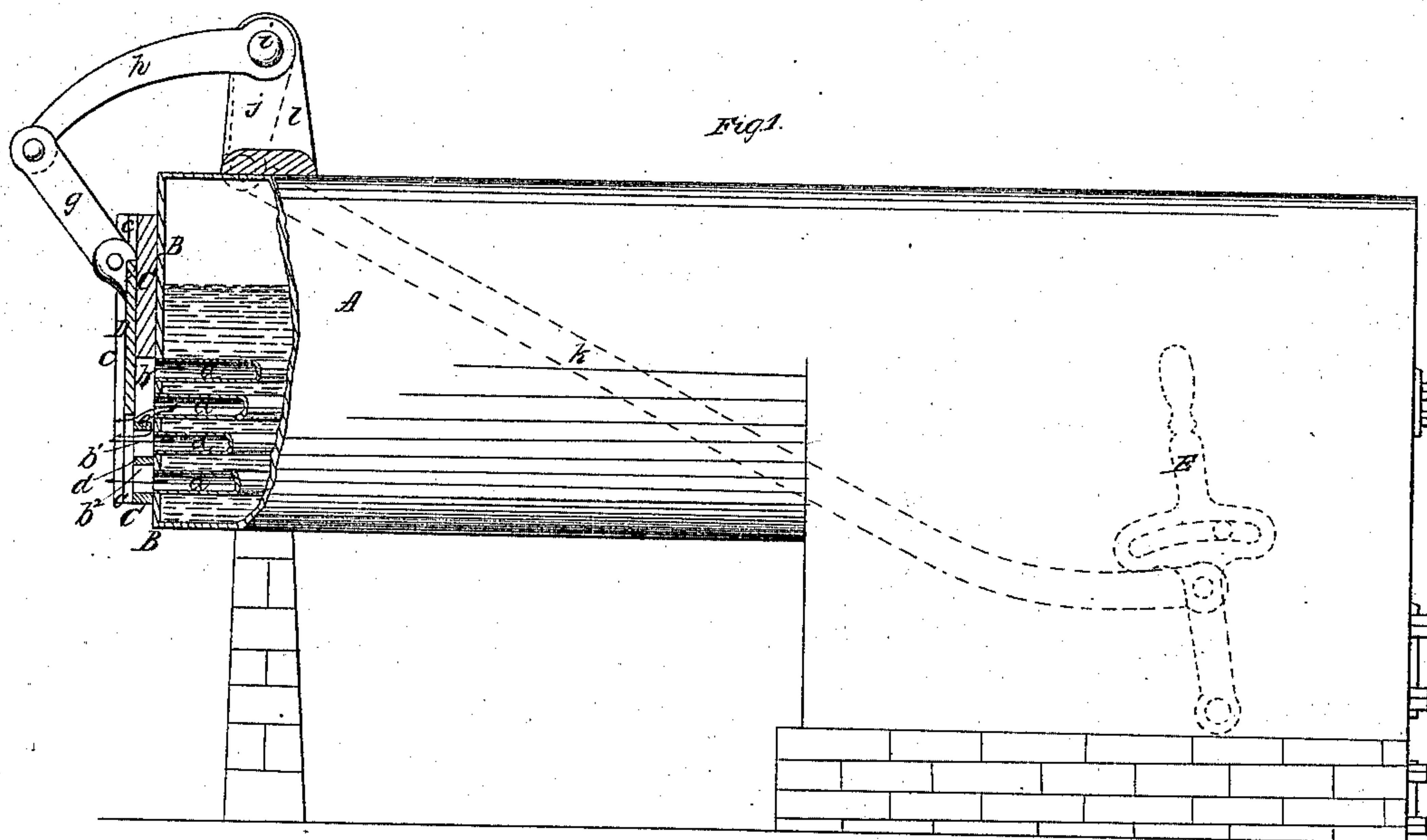


J. R. ROBINSON.
DAMPER FOR MULTITUBULAR BOILERS.

No. 32,533.

Patented June 11, 1861.



Witnesses:
C. W. Cowtair

Inventor:
J. R. Robinson

UNITED STATES PATENT OFFICE.

J. R. ROBINSON, OF BOSTON, MASSACHUSETTS.

DAMPER FOR STEAM-BOILERS.

Specification of Letters Patent No. 32,533, dated June 11, 1861.

To all whom it may concern:

Be it known that I, J. R. ROBINSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and
5 useful Improvement in Dampers for Multitubular Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings,
10 forming part of this specification, in which—

Figure 1, is a side elevation, partly in section, of a horizontal multitubular boiler with my invention applied. Fig. 2, is a rear end view of the same.

15 Similar letters of reference indicate corresponding parts in both figures.

The object of this invention is so to control the draft through the upper and lower tubes of a horizontal multitubular boiler as to
20 counteract the natural tendency of the gases of combustion to come out from the upper tubes at a higher temperature than from the lower ones; and to this end my invention consists principally in the combination with
25 a sliding damper applied in rear of the rear tube sheet; of a stationary frame constructed and applied as hereinafter specified.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

30 A, is the shell of the boiler; a, a , are the horizontal tubes; and B, the rear tube sheet. The smoke box in rear of the sheet B, into which the tubes a, a , discharge, is not represented in the drawing.

35 C, is an upright frame bolted to, or otherwise secured in a stationary condition close in rear of the tube sheet B, for the reception of the flat sliding damper D. This frame has long horizontal openings b, b', b^2 , each of which communicates directly with the rear
40 mouths of one or more tiers of tubes as shown in Fig. 2, and the said frame is furnished at its sides with upright guides c, c , to guide the damper and keep it close to the outer surface of the said frame. The thickness of the said
45 frame, must be sufficient to keep the damper at such distance from the tube sheet B, as to provide for the escape of the gases from the upper tubes when the damper is lowered to
50 cover the said tubes. The bar like portions d, e , of the frame, which constitute the partitions between the openings b, b', b^2 , may either fit close to the tube sheet as illustrated
55 by d , in Fig. 1, or may have spaces between them and the sheet as illustrated by e , in the

same figure, but I prefer to make one or more of the lower ones perfectly close like d , and one or more of the upper ones partly open like e .

60 The damper may be raised and lowered by any convenient means. I have represented it suspended by a rod g , from the arm h , of a rock-shaft i , which works in fixed bearings l, l , on the top of the boiler, and the arm
65 j , of the said rock-shaft being connected by a rod k , with a lever E, conveniently arranged near the front of the boiler to be operated by the engineer or fireman to adjust the damper at any height. This arrangement
70 requires the rod g , to work through the smoke box.

When the damper is raised entirely above the whole of the tubes a, a , as shown in Fig. 2, the gases leave the upper tubes which are
75 near the surface of the water at a very high temperature, and leave the lower tubes at a gradually lower temperature toward the bottom of the boiler the lowest tubes being very cool. This action is the same as in a
80 boiler without a damper applied to the tubes, and it is only necessary to raise the damper to this position when the tubes require to be cleaned out. When the damper is lowered
85 over the mouths of the upper tubes as shown in Fig. 1, the draft through those tubes, without being entirely obstructed, is so much checked by its having a downward direction
90 given to it after leaving the tubes, as indicated by arrows in Fig. 1, that the draft through the lower tubes is increased and the gases caused to leave the several tubes
95 at a more nearly equal temperature. The bar like partitions d, e , in between the openings b, b', b^2 , in the frame C, serve to enable the damper to shut off the tubes above
100 them either entirely or partially from the chimney. When the damper is brought down low enough to cover a partition constructed like d , all the tubes above are entirely closed, but when it is brought down to
105 one constructed like e , there still remains a contracted opening between the tube sheet and the frame, for the exit of the gases, from the upper tubes, but the draft is very much checked.

By the use of the term "horizontal multitubular boiler" I do not mean to confine myself strictly to a precisely horizontal arrangement of the tubes, but have merely
110 used the term in contradistinction to the term "upright."

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

1. The combination with a sliding damper, applied to the rear tube sheet of a horizontal multitubular boiler, of a stationary frame C, interposed between the said damper and the tube sheet to form a space between the tube sheet and damper, substantially as and for the purpose herein specified.
2. The construction of the so applied

frame C, with two or more openings b , b' , b^2 , each of a size to communicate with one or more tiers of tubes, said openings being separated by bar like partitions which either fit to the tube sheet or not, as shown at d , and e , in Fig. 2, substantially as herein described.

J. R. ROBINSON.

Witnesses:

LEWIS A. TUCKER,
C. W. COWTAN.