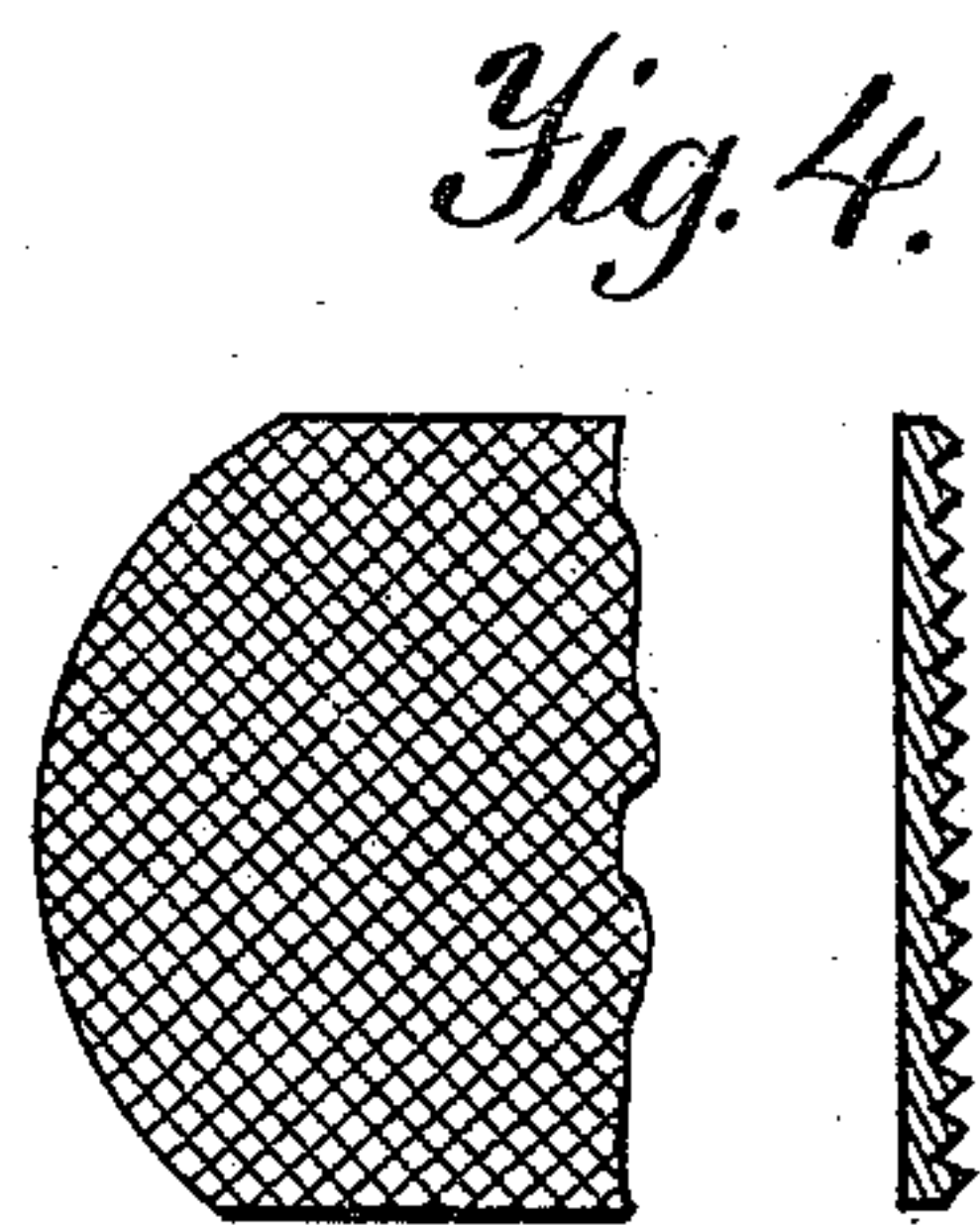
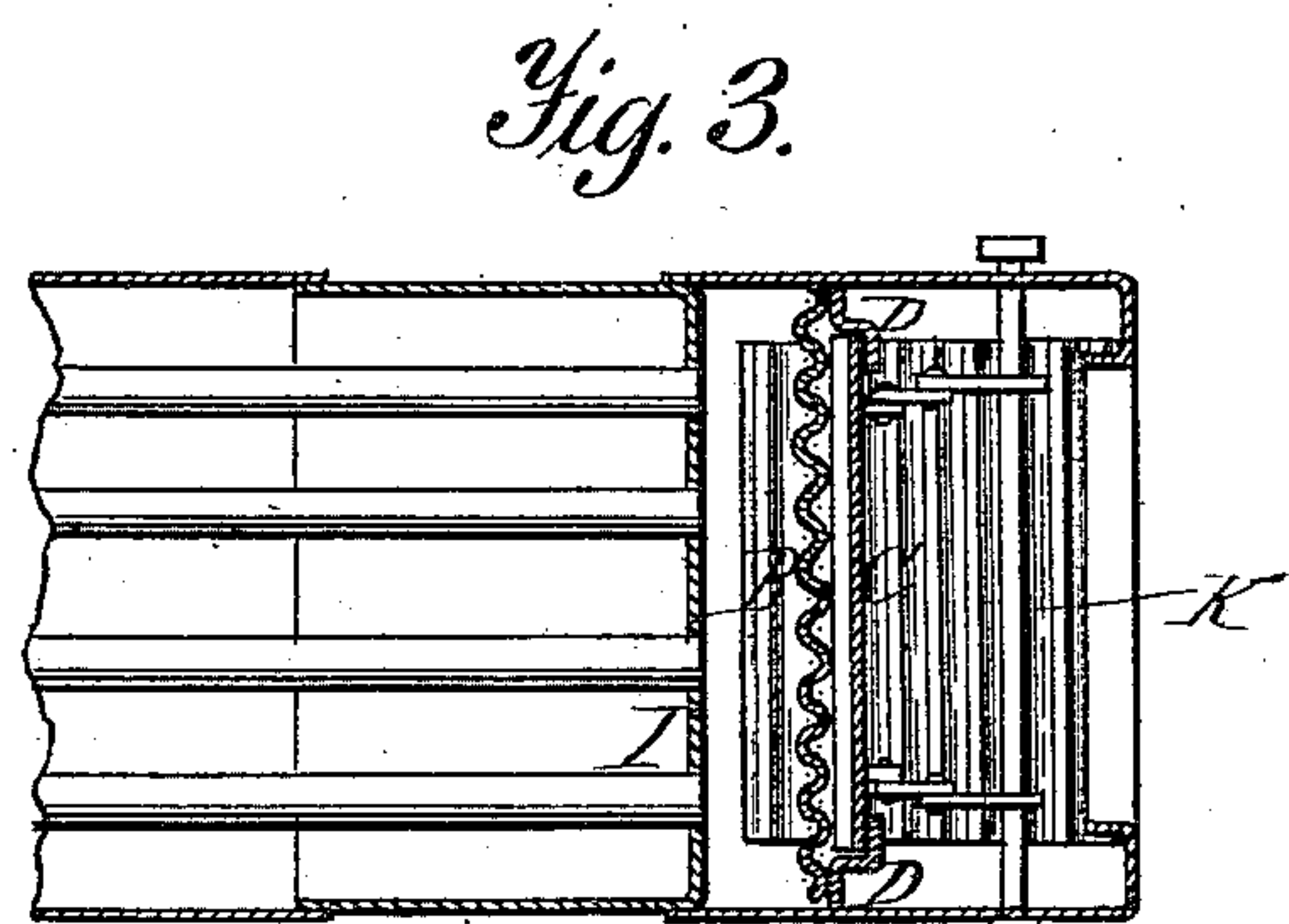
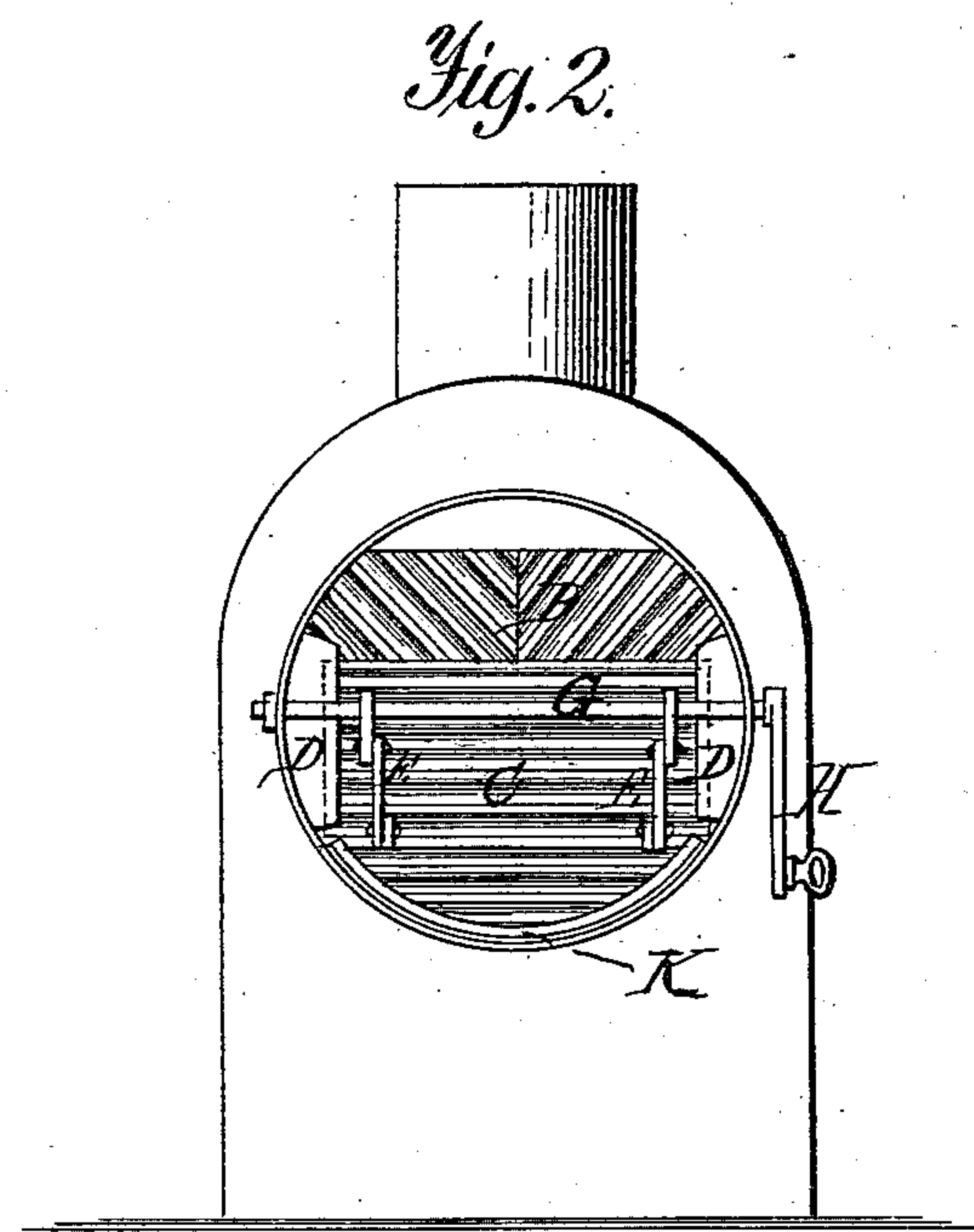
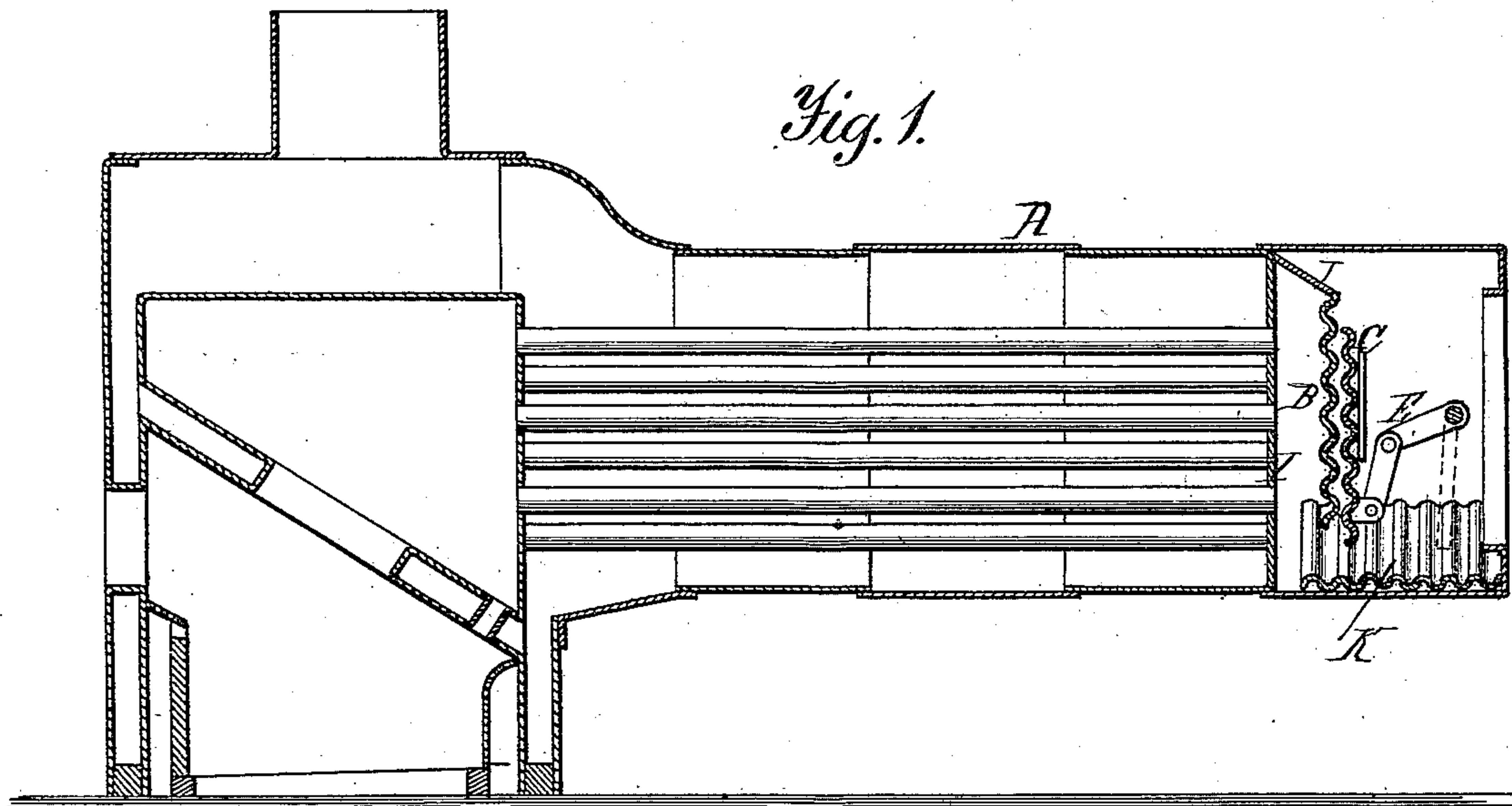


H. I. HOYT.
Locomotive-Boiler.

No. 226,231.

Patented April 6, 1880.



Witnesses.
Anton Ruppert,
Alexander Mahon

Inventor.
Henry I. Hoyt.

UNITED STATES PATENT OFFICE.

HENRY I. HOYT, OF NORWALK, CONNECTICUT.

LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 226,231, dated April 6, 1880.

Application filed February 25, 1880.

To all whom it may concern:

Be it known that I, HENRY I. HOYT, of Norwalk, county of Fairfield, State of Connecticut, have invented a new and useful Improvement in Locomotive-Boilers, which is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 shows a longitudinal section through the boiler of the locomotive and smoke-box, showing the corrugated plate and the bottom corrugated plate. Fig. 2 shows an end view of a locomotive-boiler, representing the corrugated diaphragm in position. Fig. 3 shows a horizontal section of the diaphragm and plan of corrugated bottom plate in the smoke-box end of the boiler. Fig. 4 shows one of the various modified forms of my improved diaphragm, in which a solid surface is roughened and which may be serrated, fluted, or otherwise.

A is the exterior shell; B, the corrugated diaphragm; C, its sliding plate; D D, the ways in which it moves; E E, the crank-levers thereof; G, its shaft; H, the rod; I, the tube-sheet; J, the plate-connection between tube-sheet I and diaphragm B; K, the corrugated bottom plate.

The object of my invention is to pulverize the cinders coming through the tubes of a locomotive on their way to the smoke-stack, and so reducing them to an almost impalpable powder that the greater part escapes into the air in such condition as to obviate danger of fire therefrom, as well as like danger from the combustion of the small portion deposited in the smoke-box. This is accomplished by roughening the face of metallic diaphragms, deflectors, blinds, or equivalent devices located in the smoke-boxes of locomotive or other boilers in front of the tube-sheet. For this purpose I employ corrugations, serrations, or projections upon the interior surface of such diaphragms, deflectors, blinds, or equivalent devices; or they may be made of corrugated, serrated, or roughened metallic plates, such corrugations, serrations, or equivalent roughening devices running vertically, horizontally, or at any desired angle. In connection therewith I also employ a plate of corrugated, serrated, roughened, or woven metal placed at

the bottom of the smoke-box in front of the tube-sheet, and extending forward under and beyond the lower edge of the diaphragm, deflector, blind, or other equivalent device, bent to conform to the cylindrical shape of the boiler-plate and fitted thereto.

Letters Patent were recently issued to myself and associates, No. 224,640, for devices by which what is technically called "drawing the fire" is much reduced, and consequently only a small quantity of small-sized cinder drawn from the fire-bed by the action of the exhaust.

By my invention such cinder is crushed by the mechanical devices before mentioned, which cause them to forcibly impinge against the corrugated, serrated, or roughened plates and against each other and the corrugated, serrated, or roughened metallic bottom plate by the sharp force of the exhaust, and being thus reduced to dust they readily pass out with the exhaust-steam and are discharged at each puff in such extremely small quantities and with such force as not to be discernible, and of such small size and so dampened by the steam as to be rendered incapable of setting fires along the roadway, thus securing immunity from a great source of annoyance, danger, and expense to railway companies, and at the same time obviating the necessity of carrying an accumulated body of cinder in the smoke-box, with its attendant danger, and rendering the frequent "sparking" of the boiler unnecessary.

It is immaterial in what way these plates are roughened, or to what kinds of surfaces such roughening is applied, so long as they are roughened surfaces opposed to the exit of the cinder between the tubes and stack; but the form I prefer is that of a rising and falling plate-diaphragm, such as is shown in the drawings, which should be adjustable at pleasure, or operative by a lever and crank from the cab of the locomotive, by which the draft through the tubes is equalized, as well as breaking up and deflecting the cinder and compelling it to be precipitated to the bottom of the smoke-box.

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

1. A roughened opposing cinder plate or plates located vertically between the tube-sheet

and the smoke-stack of a steam-boiler, constructed and operating substantially as and for the purposes set forth.

2. In combination with a deflecting plate or
5 board, a corrugated or serrated cinder-plate at the bottom of the smoke-box, constructed and operating substantially as and for the purpose described.

3. The combination, in a steam-boiler, of a
10 smoke-box in front of the tube-sheet, a rising

and falling roughened plate-diaphragm, and a corrugated or serrated plate at the bottom of the smoke-box in front of the diaphragm, operating together, substantially as and for the purposes explained.

HENRY I. HOYT.

Witnesses:

ALEXANDER MAHON,
N. B. SMITH.