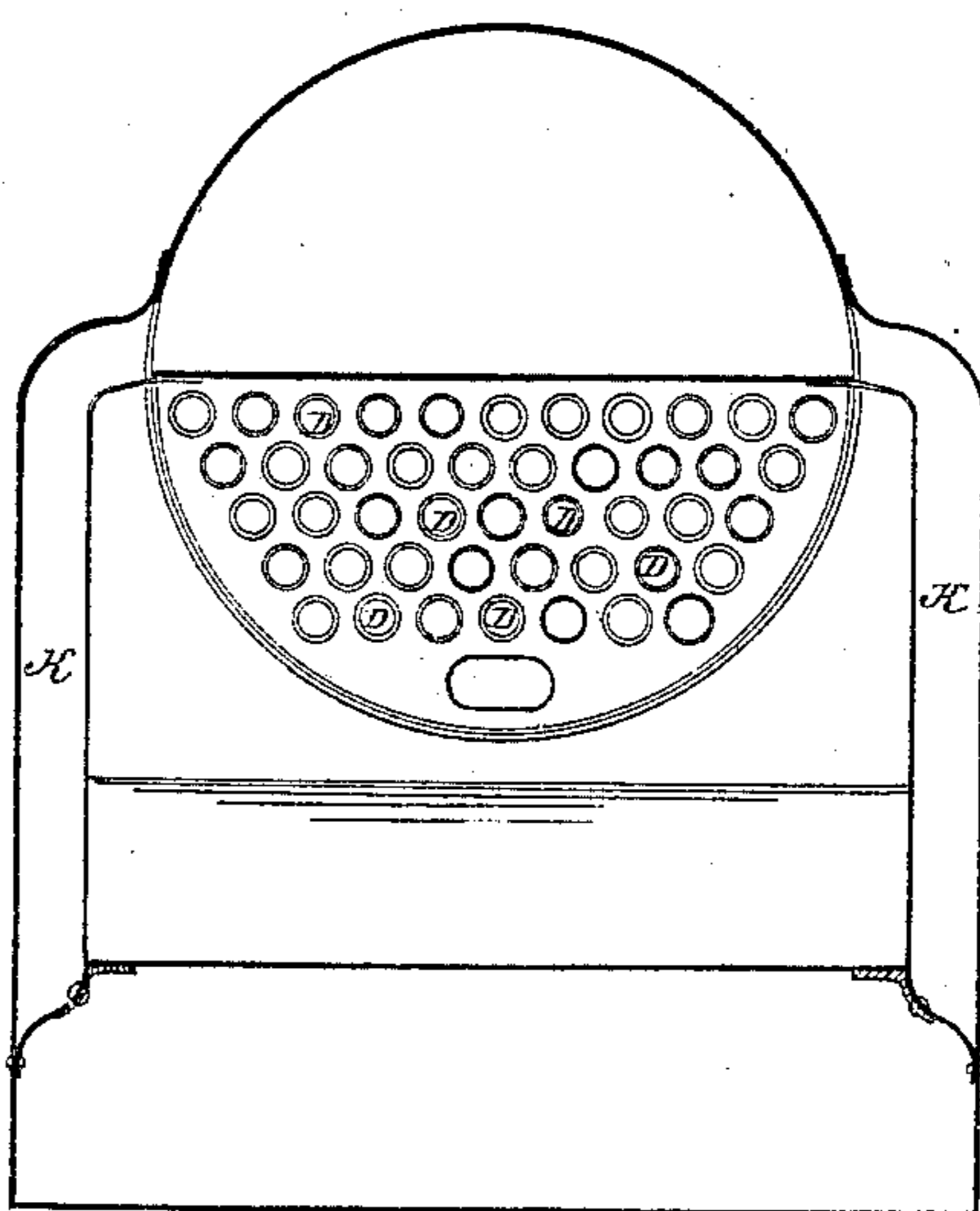
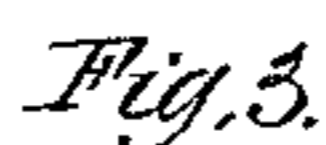


Patented Sep. 29, 1857.



UNITED STATES PATENT OFFICE.

WILLIAM M. ELLIS AND JONAS B. ELLIS, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 18,276, dated September 29, 1857.

To all whom it may concern:

Be it known that we, WILLIAM M. ELLIS and JONAS B. ELLIS, both of the city of Washington, in the District of Columbia, have invented a new and useful Improvement in what is termed the "Wagon-Head Steam-Boiler," of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical longitudinal section of a steam-boiler embracing our improvement. Fig. 2 represents a transverse section through the same at the line O O; and Fig. 3 represents a similar section at the line *x x* of Fig. 1.

The object of our invention is to enlarge the fire-surface and add to the strength of the boiler without correspondingly contracting its water-space or increasing its bulk or weight; and, further, by obviating the necessity for stays in the interior of the boiler to obtain more space for tubes, and thus provide incidentally for an increase of the flue surface also.

Our invention consists in strengthening the body of the boiler at its junction with the water-legs in such manner that the usual internal stays may be dispensed with, thus leaving more space for tubes or flues, while at the same time the passages remain open, as before, for the circulation of the water through the legs and body of the boiler.

To effect this improvement we connect the water-legs to the body of the boiler by means of a strong stay-plate of not less than twice the thickness of the shell of the boiler. In this plate are made a series of perforations of such size that while they will not take away more than one-half of the transverse strength of the plate they will yet afford sufficient space for the water to flow through freely between the water-legs and the body of the boiler. This mode of connecting the two semi-cylindrical portions of the boiler gives to it, without occupying its interior by stays, the strength it has hitherto derived from their introduction, thus securing to the wagon-head boiler, in addition to its ordinary advantages, the strength of the cylindrical boiler without diminishing its capacity for receiving tubes for flues.

The accompanying drawings represent a portable steam-boiler embracing our improvement.

Beneath the boiler is a furnace, A, with a door, *a*, on one side, through which the fuel may be supplied. A flue, B, serves to conduct the products of combustion from the furnace A to the chamber C at the rear of the boiler, where they enter the return-tubes D, which form a communication between the space C and the smoke-box E. From the latter they escape by the chimney F to the open air. This chimney F is hinged or jointed so that its upper portion, G, can be turned backward and downward when required to rest upon the top of the boiler. In the front of the smoke-box E, and in line with the return-tubes D, is a door, H, to facilitate the clearing of the tubes and smoke-box from cinders. A similar door, I, is placed at the opposite or rear end of the boiler.

The furnace A is surrounded by the water-legs K, which, in this instance, rise perpendicularly to the boiler, so as to unite with it just above the low-water line, or they may widen out gradually from the bottom to the level at which they are intended to unite with the boiler and then be curved inward to it. They are connected with the cylindrical part or body of the boiler in the following manner: A strong stay-plate, N, of the same length as the shell of the boiler is placed between the flanges M of the water-legs K and the shell of the boiler and strongly riveted to both. Holes P are made through the stay-plate N to permit the water to circulate freely through the water-legs.

The operation of a steam-boiler is so well understood that a description of it here is unnecessary.

Having thus described our improved boiler, what we claim as our invention, and desire to secure by Letters Patent, is—

Connecting the upper and lower parts of the shell of the body of the boiler by means of a strong perforated plate, N, which performs the double office of staying the boiler and forming a passage for the circulation of the water and steam through the legs and body of the boiler.

In testimony whereof we have hereunto subscribed our names.

WM. M. ELLIS.
J. B. ELLIS.

In presence of—
J. D. CLARK,
GEO. SEITZ.