

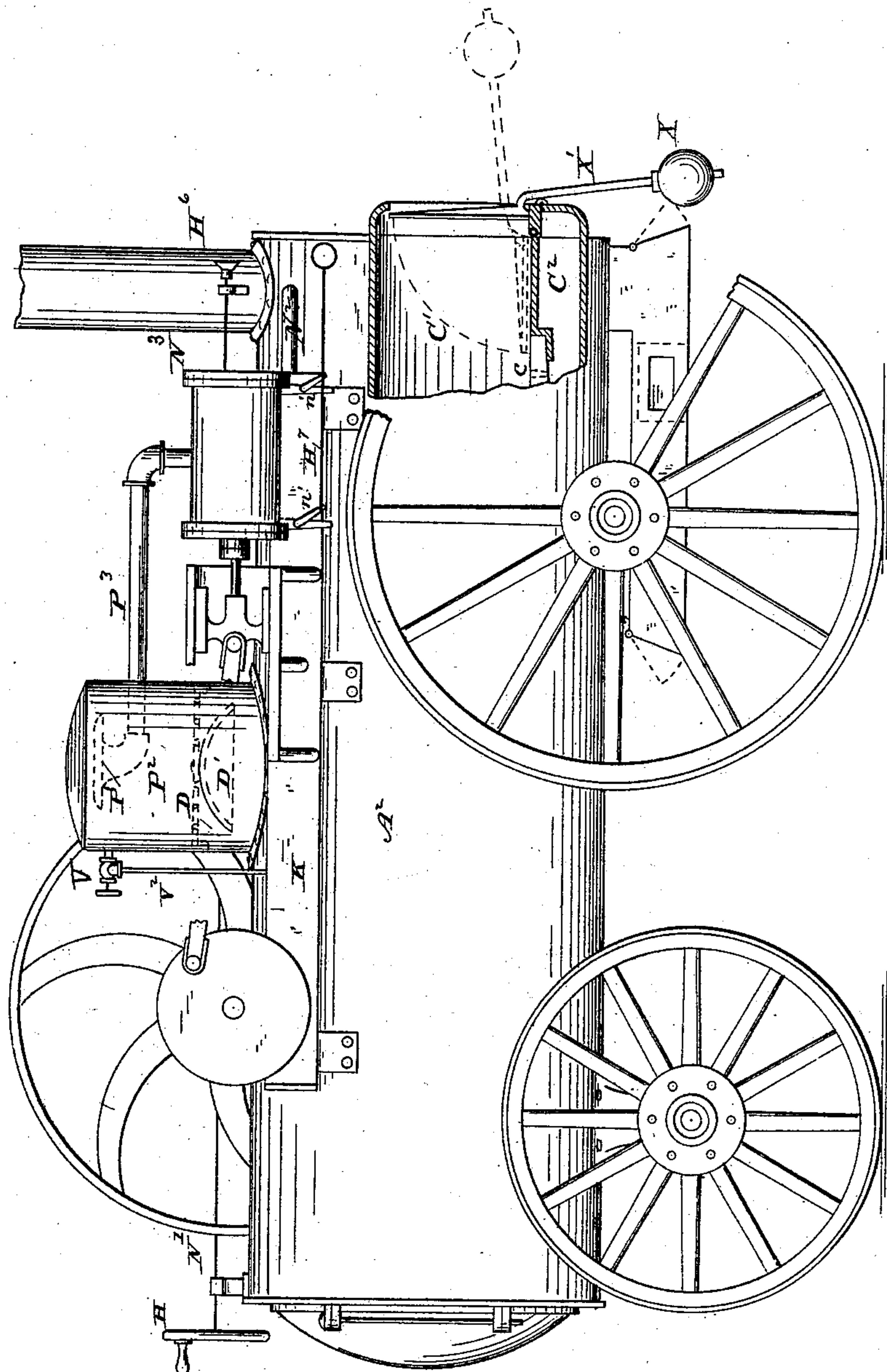
(No Model.)

J. H. ELWARD.

SEPARATOR FOR PORTABLE STEAM ENGINES.

No. 275,615.

Patented Apr. 10, 1883.



Witnesses:

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A. J. Houghton.

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UNITED STATES PATENT OFFICE.

JOHN H. ELWARD, OF STILLWATER, MINNESOTA.

SEPARATOR FOR PORTABLE STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 275,615, dated April 10, 1883.

Application filed August 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, a citizen of the United States, residing at Stillwater, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Separators for Portable Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters or figures of reference marked thereon, which forms a part of this specification.

The figure in the drawing shows a considerable portion of a traction or portable engine, the features of my invention being more especially applicable to engines of that class.

The boiler, traction mechanism, and the furnace may be of any desired construction, my invention pertaining to improvements in the engine.

The parts of the engine with which the features of my invention are intimately related are the steam-dome P^2 , the cylinder, the connecting steam-pipe P^3 , the heater K , and exhaust-pipe N^2 .

In traction-engines of the class illustrated much trouble is caused by the splashing and foaming of the water, and it is caused to enter the cylinder and seriously interfere with the proper operations of the engine. With the engine I have combined a series of devices to prevent this injurious result.

D is a perforated plate or diaphragm. Below this perforated plate or diaphragm there is a downwardly-turned cone or baffling-plate, D' . It is supported by the plate D , and is situated directly over the aperture through which the steam passes out of the boiler. The steam impinges upon the under side of it, and most of the water which comes out with the steam is caught by it and guided downwardly again. The steam passes around the cone or baffling-plate and up through the perforations in the plate D ; but nevertheless considerable water in the form of spray and foam is thrown into the upper part of the dome, and thus has a tendency to enter the steam-pipe if the steam is taken from the dome in the ordinary man-

ner. To prevent such entrance of water into the steam-pipe, I combine with the downwardly-turned cone or baffling-plate D' and with the perforated plate or diaphragm D an upwardly-turned bell-shaped nozzle or mouth-piece, P' , which is attached to the connecting-pipe P^3 , and has its open end situated as near as possible to the top of the dome. This assists the other parts largely in preventing the sucking of any water from the boiler into the engine. The upwardly-turned bell-shaped nozzle or mouth-piece P' , on account of its flaring outwardly, operates to throw the currents of steam out against the walls of the dome before the steam can enter the connecting-pipe P^3 , and any particles of water which may escape from the diaphragm and the baffling-plate below it will be deposited upon the sides of the dome and carried downward to the boiler through the perforated diaphragm. Thus this nozzle or bell-shaped mouth operates, in combination with the diaphragm and the baffling-plate, to more effectually separate the dry steam than do any of these devices used separately, as heretofore. The aperture for allowing the steam to escape from the boiler is on substantially the central vertical line of all the separating devices, so that the steam virtually escapes from the boiler to the connecting-pipe in a substantially straight path, so that condensation is avoided, and at the same time it is compelled to impinge upon the various parts of the separating mechanism to remove the water; but even when checking devices of this improved character are used there is still a tendency for water to pass as far as the cylinder, though the quantity of water carried there is much smaller than when the ordinary devices are employed. When water does enter the cylinder it seriously interferes with its proper operations; hence it becomes necessary to open the cylinder-cocks very quickly at times to let the water out. As it is difficult for the operator of a traction-engine to get at these cylinder-cocks soon enough, injury often results to the cylinder from delaying to open them. I have succeeded in devising a construction which obviates this difficulty. I provide the cylinder-cocks with arms $n'n'$, and to said arms I pivot a lever or rod,

H⁷. This rod extends to the engineer's platform, and by these devices the operator is enabled to open the cylinder-cocks instantly without requiring the stopping of the engine or necessitating his leaving the platform.

I do not broadly claim the upwardly-turned pipe or nozzle in the steam-dome for separating the steam from the water, as I am aware that this has been used in stationary boilers; nor do I claim a conical deflector in a steam-dome arranged immediately above the aperture in the boiler, and a plate above said deflector, such construction being illustrated in German Patent No. 3,893. My separating devices, however, are superior to those in either of the classes above mentioned, superior to those of the kind last above alluded to, in that they insure that the steam, after it escapes from the boiler, shall all be forced into contact with one or another of the various collecting-surfaces in such way as to deposit the small particles of water carried by or suspended in the steam, and this is not necessarily effected by the separating devices shown in said patent. The steam rises in a current or jet, and if first spread by a conical deflector, there is a stream of steam passing by on all sides of the deflector and over its top, and, even though a supplemental plate be arranged above the steam, will pass between them without so coming in contact with either as to deposit the water carried by it. With devices of the nature of mine, however, there is necessarily produced an impact of every part of the steam upon the collecting-surface, the downwardly-turned baffling-plate being so shaped and situated that the steam, before being disseminated, is guided against it—that is, to a point where the steam is moving most strongly as a jet. Moreover, by arranging the oppositely-turned deflector—namely, the bell-shaped mouth-piece of the connecting-pipe in the upper part of the steam-dome—I insure a separation supplemental to that effected by the diaphragm and the downwardly-turned baffling-plate, and at

a point where I take advantage of any condensation that may have resulted in the passage of the steam from the boiler to the end of the connecting-pipe. It is well known to those practically acquainted with traction-engines that it is ordinarily impossible to catch with a single collecting-surface all of the water which is carried both by the rising of the steam and also by the dashing of water resulting from the motion of the engine, and therefore I have found it advantageous to compel the steam at several points to be subjected to the action of the separating-surfaces. By arranging one plate directly across the path of the steam at the point where it issues as a jet I cause it to impinge thereon more effectively than if the jet of steam is first broken up and the steam then subjected to the action of a transverse plate.

I do not in this application claim any matters of novelty relating to the furnace, as I have made such features the subject-matter of another application which I am about to file, in this case limiting myself to the devices combined with the steam-dome.

What I claim is—

In a portable engine, the combination of the following elements: the boiler provided with an aperture, the steam-dome, the concave downwardly-turned baffling-plate D above the steam-aperture, and arranged to receive the impact of the steam at a point where the latter is moving as a jet from the boiler with high velocity, the perforated diaphragm across the dome above said concave plate D, the upwardly-turned outwardly-flaring nozzle P' at the top of the steam-dome, and the connecting-pipe attached to said nozzle, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. ELWARD.

Witnesses:

W. S. GOODHUE,
L. C. PROCTOR.