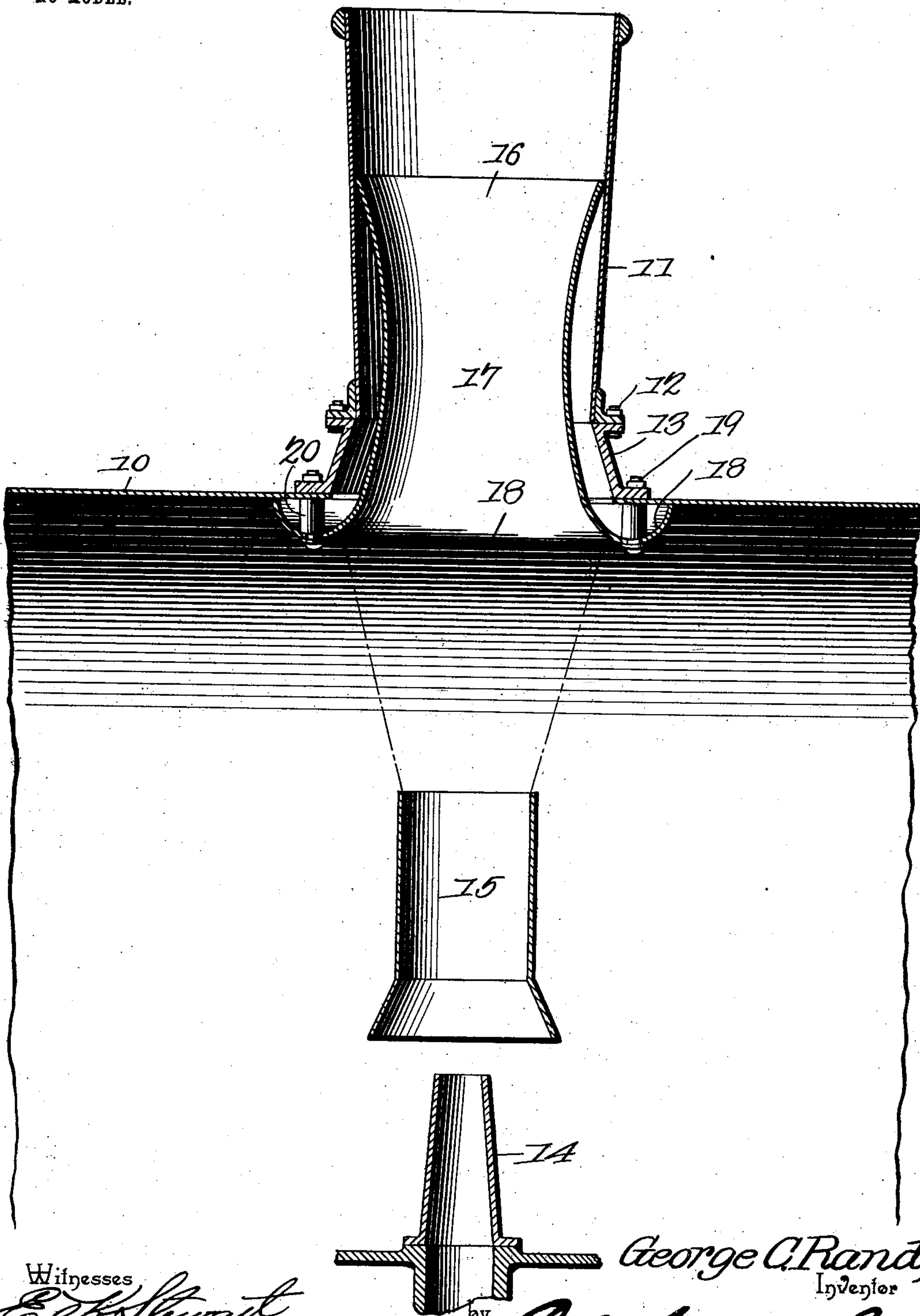


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G. C. RAND.
ATTACHMENT FOR SMOKE STACKS.
APPLICATION FILED AUG. 27, 1903.

NO MODEL.



Witnesses
E. F. Stewart
C. N. Woodward

George C. Rand,
Inventor
by *C. A. Snow & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE CLINTON RAND, OF DICKEY, NORTH DAKOTA.

ATTACHMENT FOR SMOKE-STACKS.

SPECIFICATION forming part of Letters Patent No. 744,403, dated November 17, 1903.

Application filed August 27, 1903. Serial No. 171,005. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CLINTON RAND, a citizen of the United States, residing at Dickey, in the county of Lamoure and State of North Dakota, have invented a new and useful Attachment for Smoke-Stacks, of which the following is a specification.

This invention relates to the smoke-stacks of steam-generators, more particularly to the stacks of locomotives, and has for its object to improve the draft and also prevent the destruction of the stack by the action of the exhaust-steam and the products of the combustion coming in contact therewith.

The invention consists in certain novel features of construction, as hereinafter shown and described, and specified in the claims.

In the drawing illustrative of the invention, in which corresponding parts are denoted by like designating characters, the figure is a sectional elevation of the smoke-stack and a portion of the smoke-chamber of a locomotive with the improvement applied.

The improved device may be attached to any form of steam-generator smoke-stack, but is more particularly applicable to the stacks of locomotives, as the wear and concussion is more severe in generators of this character; but while I have shown the device applied to a locomotive smoke-stack for the purpose of illustration I do not wish to be limited in any manner in the use of the device to any specific form of generator or stack, but reserve the right to its use wherever it may be found practicable.

In the drawing employed to illustrate one embodiment of the invention, 10 represents a portion of the smoke arch or chamber, and 11 the smoke-stack connected, as by bolts 12, to the smoke-chamber by the base member 13, these parts being of the usual construction.

The "petticoat-pipe" of the exhaust-nozzle 14 is represented at 15 and located below the central line of the stack in the usual manner.

The improved device consists of a tubular shield or guard (represented as a whole at 16) inserted into the lower portion of the stack and depending below its lower or intake end and extending for some distance into the smoke-chamber, as shown. The tu-

bular member 16 extends also for some distance into the stack and is intermediately contracted, as shown at 17, and with the lower end flaring outwardly and curving upwardly, as at 18, and extended outside the vertical line of the stack and likewise for some distance below its lower line. Above the contracted portion 17 the member 16 is gradually curved outwardly and upwardly and rests by its upper rim against the interior of the stack.

The relative proportions of the parts 11 and 16 may be varied to correspond to the varying conditions which are encountered in different forms and construction of generators; but for an ordinary stack of about eighteen inches in diameter and thirty-two inches long the pipe 16 should extend two-thirds of the distance upwardly therein and depend three or four inches below the bottom, with the contracted portion 17 about fifteen inches in diameter and located about twelve inches above the bottom of the stack; but while these dimensions will produce the proper action of the parts and effect the required results I do not desire to be limited in any manner thereby, but reserve the right to modify them to any desired extent.

The holding-bolts 19 are shown extended through the curving rim 18 of the member 16 and rounded at their lower ends and with spacer-tubes 20 between the rim and the shell 10, so that the parts 10 to 13 and 16 are all connected by one set of bolts, which is the preferable means for securing the parts.

The longer curved lines of the member 16 will gradually merge into the shorter curve of the portion 18, so that no abrupt portions are produced to check the upward flow of the steam or products of the combustion. By this form and arrangement of parts the exhaust-steam rising from the exhaust-nozzles will meet only gradually-curving lines and be deflected with the least resistance to the center of the stack and will not be checked or retarded by engaging abrupt angles or turns, thus producing a free and unobstructed exhaust and materially aiding in the combustion and preventing back pressure in the smoke-chamber.

The impact of the exhaust-steam against the side walls of the stacks of locomotives is very severe, especially at the juncture with

the smoke-chamber, resulting in their rapid deterioration and requiring frequent renewal, which in the case of railway companies having heavy traffic is a very large item of expense. With the attachment herein described the wear and impact is borne entirely by the member 16, which, being comparatively inexpensive and easily replaced, results in a very material lessening of the expense item for new stacks and prolongs the "life" of the stack.

Another important advantage resulting from the arrangement and form of the member 16, especially the curved outwardly-flaring lower end, is that in event of any variation, displacement, or irregularity in the location of the exhaust-nozzles the upwardly-rushing currents will be deflected uniformly to the center of the stack, and thus prevent any retardation or creation of back pressure in the smoke-chamber, as will be obvious.

The member 16 will be of any suitable metal and of strength to withstand the strains to which it will be subjected.

What I claim is—

1. In a steam-generator, the combination with the smoke-chamber having the smoke-stack extending therefrom, of a tubular shield depending below the intake end of the stack and extending upwardly therein with said shield contracted intermediately and with the upper part curving upwardly and outwardly into engagement with the interior of the stack and the lower part curving downwardly and outwardly and attached to the smoke-chamber outside the line of the stack, substantially as described.

2. In a steam-generator, the smoke-chamber, the smoke-stack having a laterally-extending base connected to said smoke-chamber, a tubular shield disposed within the intake end of said smoke-stack and depending into said smoke-chamber, said shield member intermediately contracted within said

stack and curving outwardly and upwardly above said contracted portion and curving outwardly and downwardly below said contracted portion with the lower rim curved upwardly and outwardly beyond the line of the stack and connected to said base member, substantially as described.

3. In a steam-generator, the smoke-chamber, the smoke-stack having a laterally-extending base connected to said smoke-chamber, a tubular shield disposed within the intake end of said smoke-stack and depending into said smoke-chamber, said shield member intermediately contracted within said stack and curving outward and upwardly above said contracted portion and curving outwardly and downwardly below said contracted portion with the lower rim curved upwardly and outwardly beyond the line of the stack, spacers between said curved rim and said base member, and clamp-bolts connecting said base member and shield-rim through said spacers, substantially as described.

4. In a steam-generator, the smoke-chamber, the smoke-stack having a laterally-extending base connected to said smoke-chamber, a tubular shield disposed within the intake end of said smoke-stack and depending into said smoke-chamber, below the lower line of the smoke-stack, with the depending portion curving downwardly and outwardly and terminating in an upwardly-curved rim extending outside the vertical line of the smoke-stack, and bolts connecting said base member and shield member to the wall of said smoke-chamber, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE CLINTON RAND.

Witnesses:

J. D. RAINEY,
C. H. MACK.