

(No Model.)

J. W. MALONEY.

SPARK ARRESTER.

No. 331,072.

Patented Nov. 24, 1885.

Fig. 1.

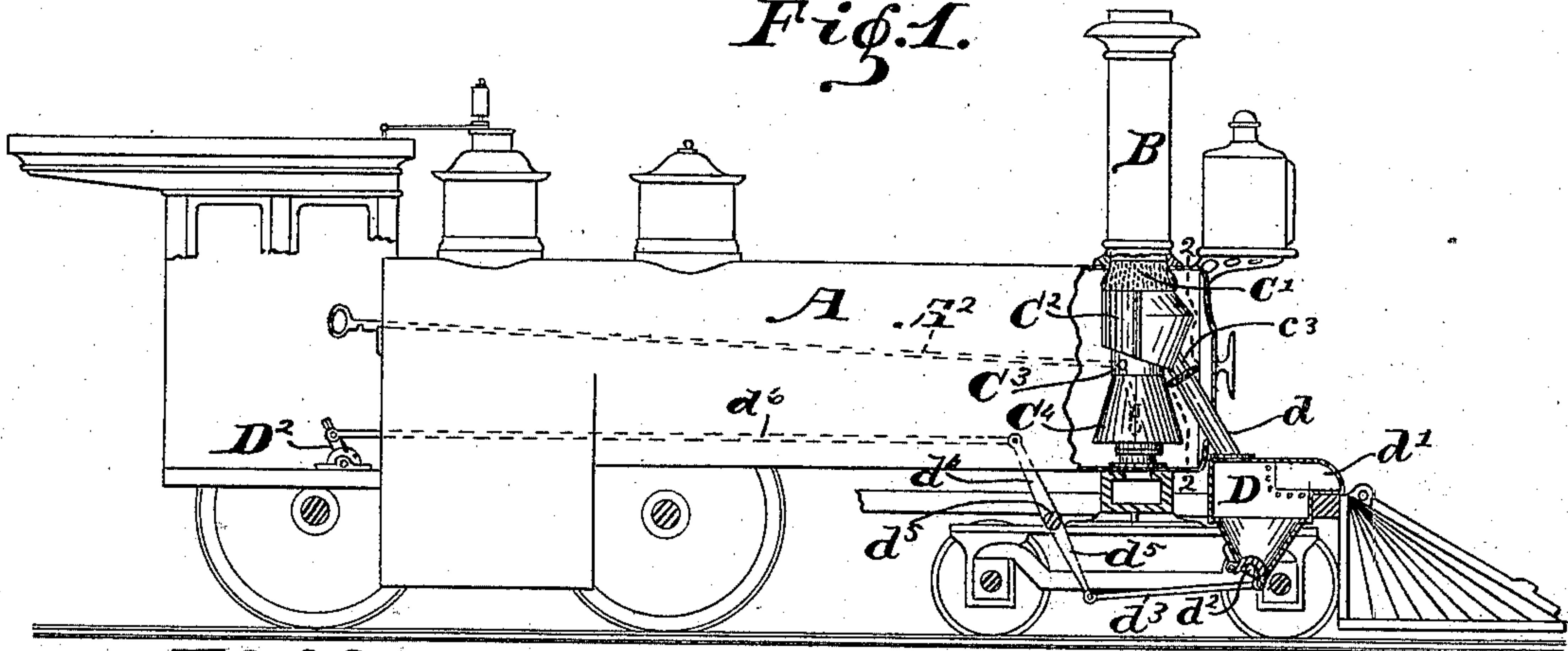


Fig. 3.

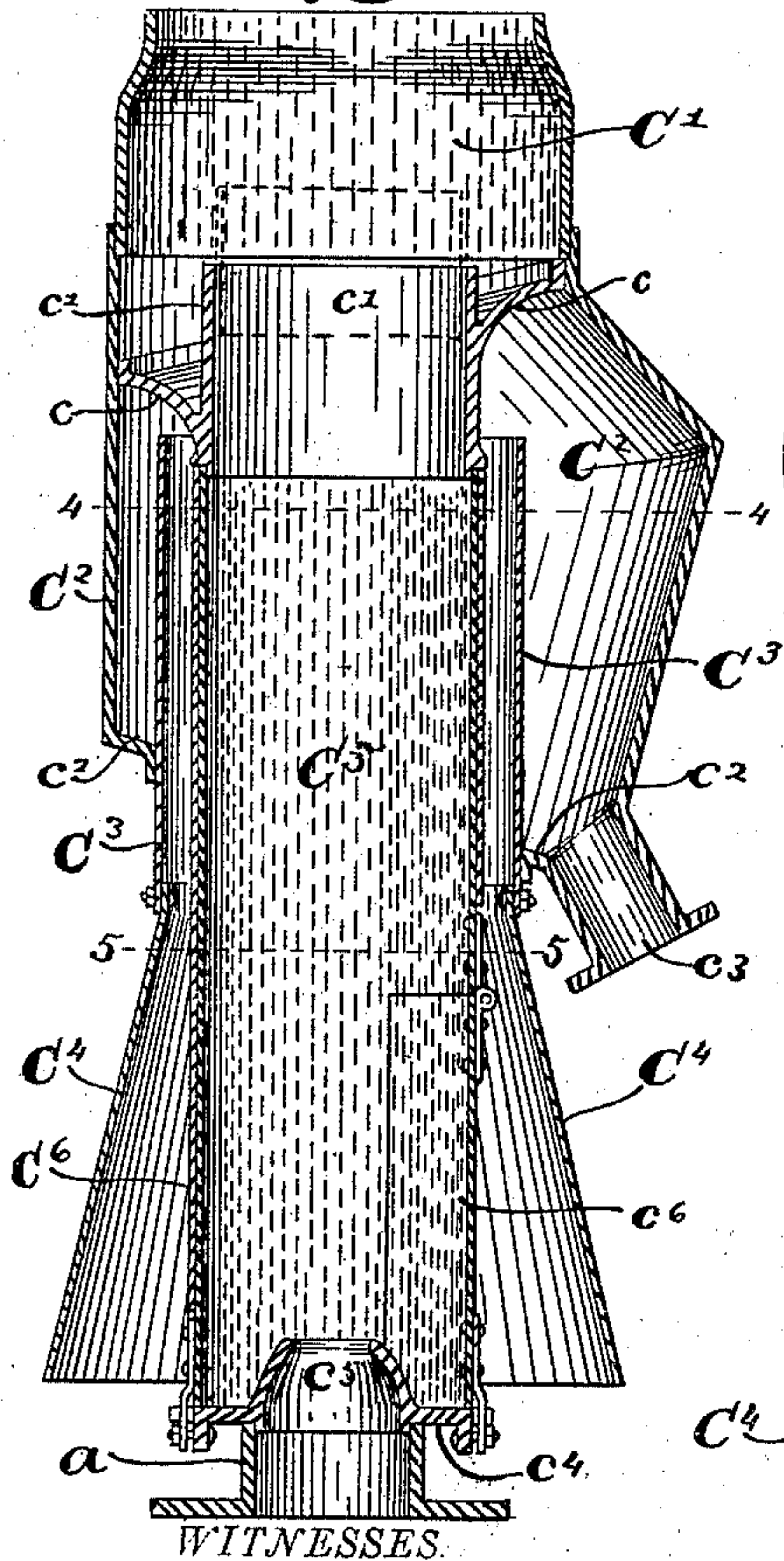


Fig. 2.

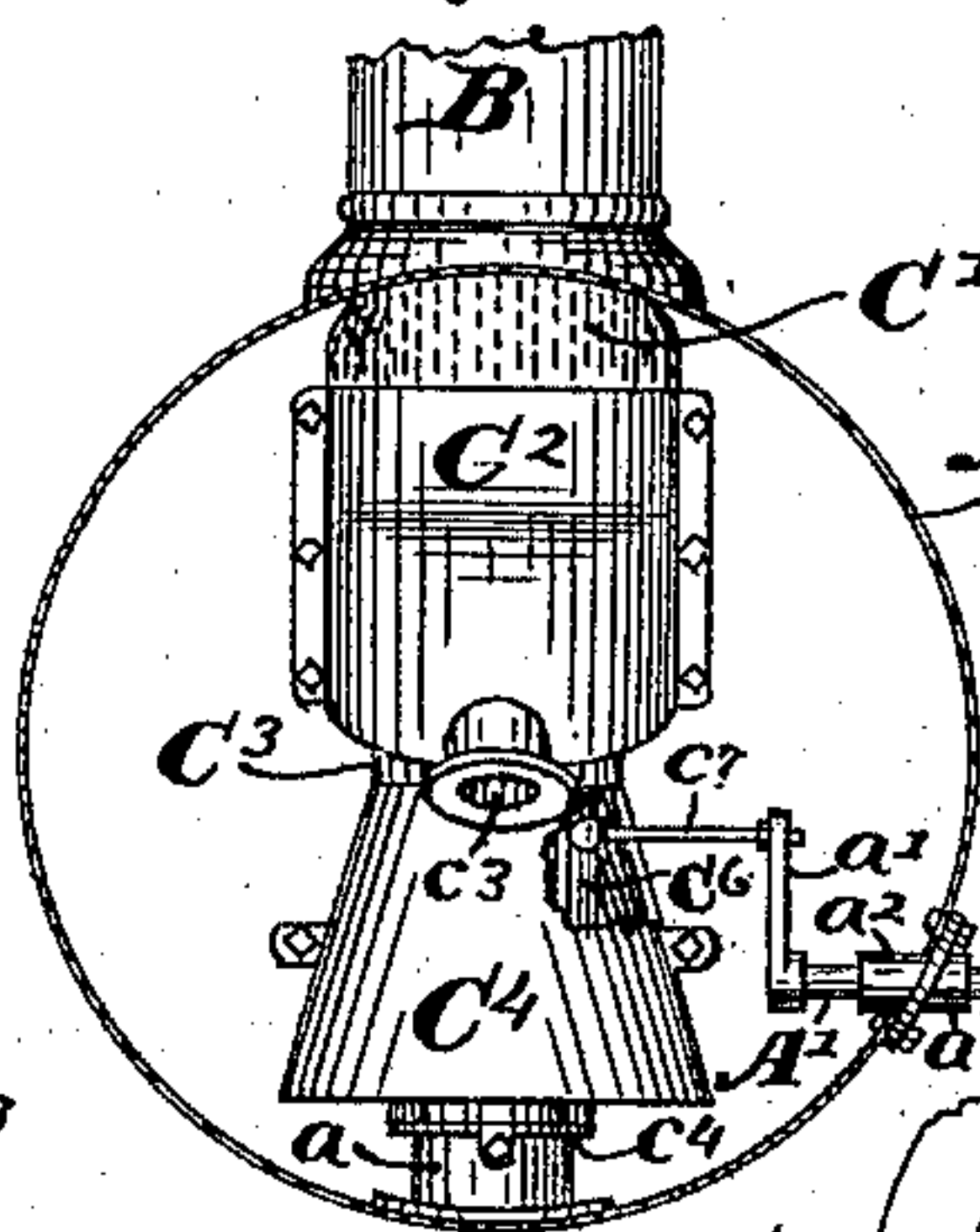


Fig. 4.

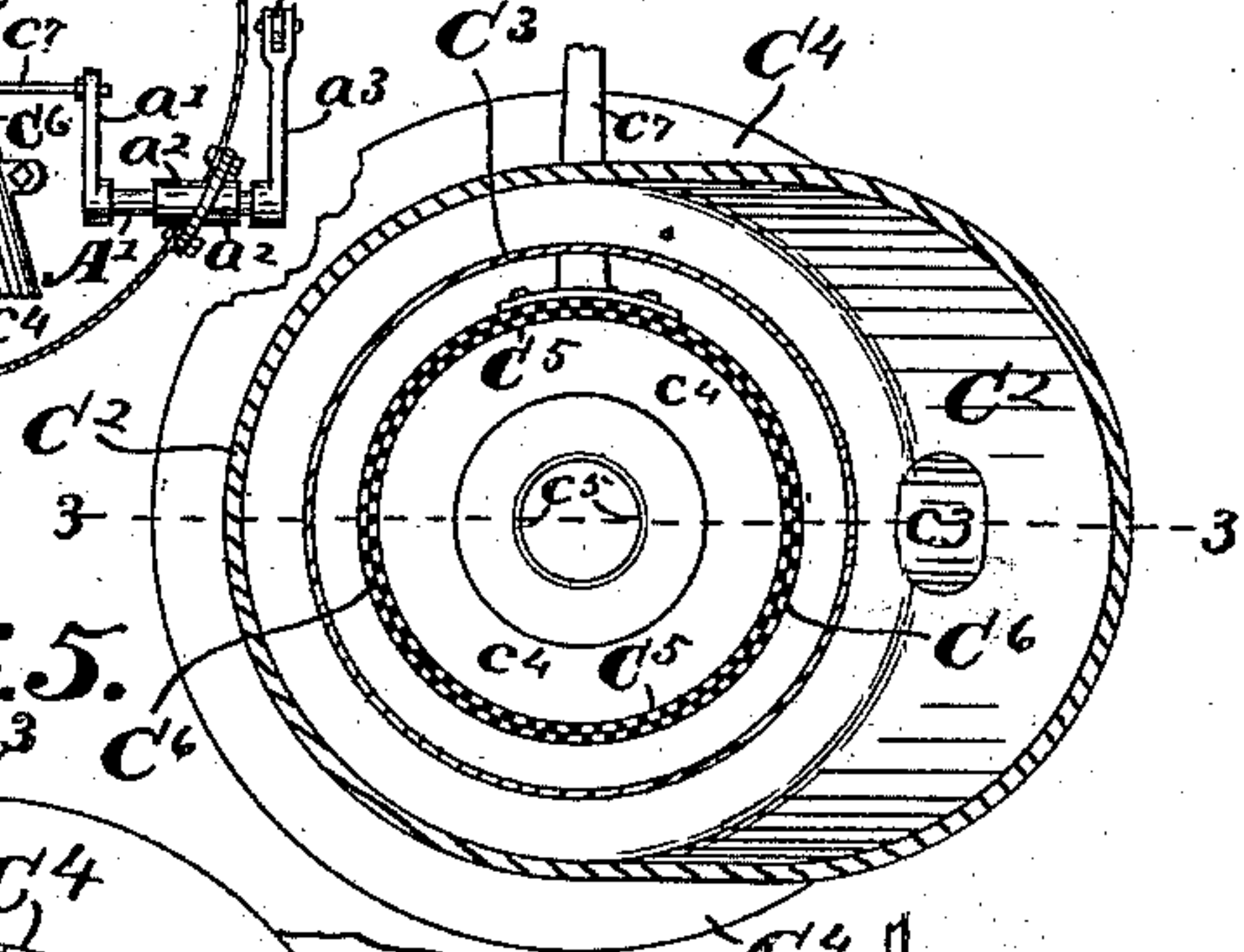
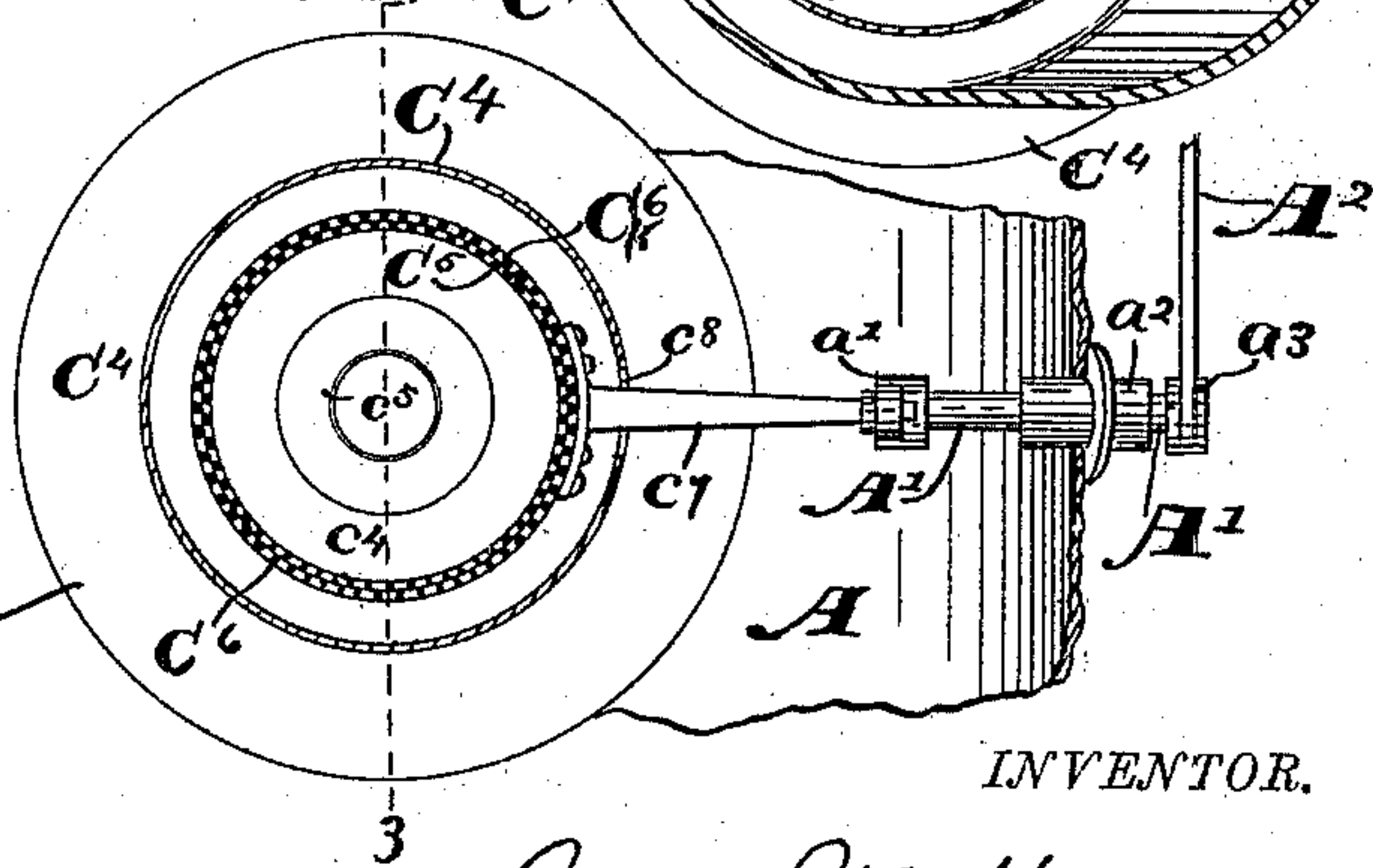


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN W. MALONEY, OF INDIANAPOLIS, INDIANA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 331,072, dated November 24, 1885.

Application filed September 8, 1885. Serial No. 176,472. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. MALONEY, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification.

My present invention consists in various improvements on that construction of spark-arresters shown in Letters Patent No. 314,254, granted to me on March 24, 1885, by the use of which said spark-arrester is rendered more perfect in operation, more convenient to clean, and less liable to become clogged by "sweat" or cinders, as will be hereinafter more particularly described.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a side view of a locomotive provided with my said invention, one side of the smoke-box being broken away to show its location and arrangement; Fig. 2, a front elevation of said invention and surrounding parts as seen when looking to the left from the dotted line 2 2 in Fig. 1; Fig. 3, a central vertical section through the device separated on the dotted line 3 3 in Figs. 4 and 5; Fig. 4, a cross-section looking downwardly from the dotted line 4 4 in Fig. 3, and Fig. 5 a similar view on the dotted line 5 5 in same figure.

In said drawings, the portions marked A represent the boiler; B, the smoke-stack; C', C², C³, C⁴, C⁵, and C⁶, the several parts of the spark-arrester proper, and D a receptacle for the sparks.

The boiler, smoke-stack, and surrounding parts are or may be of any ordinary or suitable construction, and therefore need no special description. The screen and inverted cone commonly used in the smoke-stack are, however, omitted, leaving said smoke-stack entirely free from obstruction.

As in the aforementioned Letters Patent, the body of the spark-arresting device is composed of several parts, which are arranged in substantially the same general manner. The upper part, C', is perforated and connected to the lower end of the smoke-stack. The second part, C², is connected to the first and extends down a short distance, surrounding the

inner portions. It is provided with a funnel-shaped top, *c*, inclined from its front to rear side. Around the edge of the central opening therein, and cast integrally with said top, is an upwardly-projecting pipe, *c'*, which extends up about to the lower edge of the perforated part C', and thus conducts the exhaust and smoke from below directly into the "upper draft," and prevents it from expanding into the enlarged portion just below the part C' and impairing the draft. As will be readily seen, this pipe can be made adjustable, if desired, by simply adding a section of pipe, as shown in dotted lines, which can be adjusted up or down, as the weak or strong current of the exhaust from below seems to demand. Said part is also provided with an inclined bottom, *c''*, terminating at its lowest point in an orifice, *c'''*, connected with a spout, *d*, which leads to the spark-receptacle. The third portion, C³, is secured in the opening in the bottom of the part C², and extends up within said part about two-thirds of the way to the top thereof and down a short distance below said bottom, as shown. The fourth part, C⁴, is secured to the lower end of said part C³, and extends down nearly to the bottom of the device. It is preferably formed flaring from its top to its bottom, and is secured to said part C³ by bolts or catches, so as to be easily detached when it is desired to get to the inside of the apparatus for any reason. A perforated pipe, C⁵, is mounted within said parts C³ and C⁴, its top being connected to the lower edge of the top *c* of the part C², and its bottom having a base-plate, *c''''*, secured thereon, which sets onto the exhaust-nozzle *a*, said plate being provided with an opening which registers with said nozzle, around which is preferably formed a flange, *c'''''*, somewhat contracted toward its end to form a perfect nose to said nozzle, as shown. In the lower front side of said pipe I provide a door, *c''''''*, and thus when it is desired to get to the inside of said pipe to clean it out, or for any other reason, it can be readily done by simply detaching the part C⁴ and opening this door, thus giving ready access to the nozzle and interior of the apparatus.

The pipe C⁵ is mounted around and is adapted to move upon the pipe C⁵, it also being perforated, said perforations being in the

shape of elongated slots in each of said pipes. It is of substantially the same length as the pipe C⁵, its lower end resting upon a projecting edge of the base-plate c⁴, except at its front side, which is preferably cut away from the top of the door c⁶ to permit the free operation of said door. (Of course this part could also be provided with a door covering the door in the part C⁵, if preferred; but I do not deem it necessary.) On one side of said pipe is riveted an outwardly-projecting arm, c⁷, which extends out through a slot, c³, in the part C⁴, and connects with an arm, a', on the inner end of the rock-shaft A', which is journaled in an air-tight bearing, a², in the shell of the boiler. On the outer end of said rock-shaft is provided an arm, a³, which is connected to a long rod, A², running to the cab. Said rod is provided with notches on its under side, near its handle, which engage with a catch-piece on the side of the cab. Thus when from sweat or any other cause the perforations in said pipes become clogged, or cinders become lodged therein, and the operation of the apparatus thus becomes impaired, the engineer or fireman, by simply taking hold of the handle on the end of said rod A² and giving it a shake, operates, through the connecting-arms and the shaft A', to move the pipe C⁶ back and forth upon the pipe C⁵, and cut off all adhering cinders, soot, or other clogs, and frees the perforations from all obstructions, and permits the free and unobstructed operation of the mechanism. By this means the operator is also enabled to partially or entirely close said perforations when from any cause it is desired so to do, the notches in the handle being arranged so as to bring said two pipes in exactly the various relative positions that may be desired.

The receptacle D for the sparks is usually located in front of the smoke-box on or in the frame-work of the cow-catcher. Its front top portion is formed of a separate piece, d¹, bolted in position, and thus if anything should be caught by the cow-catcher and thrown against said part, breaking it, it could be readily replaced without disturbing the receptacle proper. Its lower portion is preferably hopper-shaped, and is provided with a discharge-door, d². Said door is formed in the shape of a half-ball, its curve side fitting into the opening, and thus insuring a tight joint at all times, as all cinders and other matter which would become lodged upon a flat door and prevent it from being closed tightly will slide off from this by reason of its formation. It is hinged at one side, and at its other side is preferably connected back to an operating-lever, D², in the cab by means of the rod d³, levers d⁴, operating on the rock-shaft d⁵, and the connecting-rod d⁶, thus permitting the operator to empty said receptacle from the cab at any time, and then tightly close it again. In general operation my improved apparatus is not dissimilar from that shown in the

aforementioned Letters Patent, the exhaust entering through the nozzle a, and the smoke being drawn in through the perforated pipes into the smoke-stack, while the cinders are carried up over the top of the part C³ into the part C², and thence to the receptacle D, as therein; but by the use of these improvements I provide means for keeping the perforated pipes free from obstruction, means for regulating the draft, and access to the interior of the device, as has been fully set forth.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a spark-arrester secured in the smoke-box, of an internal double perforated pipe, one part of which is adapted to move upon the other, whereby said perforations may be kept unobstructed, substantially as set forth.

2. The combination, in a spark-arrester secured to the lower end of a smoke-stack, consisting of an internal perforated pipe having another perforated pipe mounted and adapted to move thereon, a surrounding pipe, an enlarged portion surrounding the upper ends of these portions, and provided with a top and bottom with an orifice leading therefrom, the space between said internal perforated pipes and the pipe surrounding them leading into this portion below its top, substantially as set forth.

3. The combination, in a spark-arrester secured to the lower end of a smoke-stack, of the parts C' and C², said part C² being provided with a top having a central opening around which is a pipe, c', extending up toward the smoke-stack, a perforated pipe secured at its top around the lower edge of said opening in said top c, and a pipe surrounding said perforated pipe and extending up into said part C², substantially as set forth.

4. The combination, with the other parts of the spark-arrester, of the perforated pipe C⁵, provided in one side with a door, c⁶, substantially as described, and for the purposes specified.

5. The combination, in a spark-arrester secured to the bottom of the smoke-stack, of a portion, C², having a top, c, provided with a central opening, and a bottom, c², having a central opening, pipes C³ C⁴, leading from below said bottom up into said portion, the perforated pipe C⁵, connected at its top to the top c of said portion C², and the perforated pipe C⁶, surrounding said pipe C⁵, and provided with an arm, c⁷, extending out through the other parts, and means connected thereto for moving said pipe C⁶ upon said pipe C⁵, substantially as set forth.

6. The combination, with a spark-arresting device secured in the smoke-box to the bottom of the smoke-stack, of the receptacle D and a pipe leading from said device to said receptacle, said receptacle being provided with a

semi-spherical door in its bottom, substantially as set forth.

7. In a spark-arresting apparatus, the combination, with the receptacle D for the sparks,
5 of a semi-spherical-shaped door, d^2 , arranged with its curved side fitting into the opening, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 4th day of September, A. D. 1885.

JOHN W. MALONEY. [L. S.]

In presence of—

E. W. BRADFORD,

CHARLES L. THURBER.