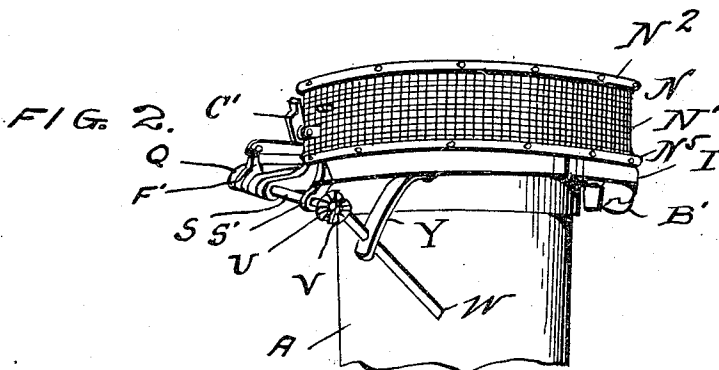


SPARK ARRESTER.

950,048.

2 SHEETS—SHEET 1.



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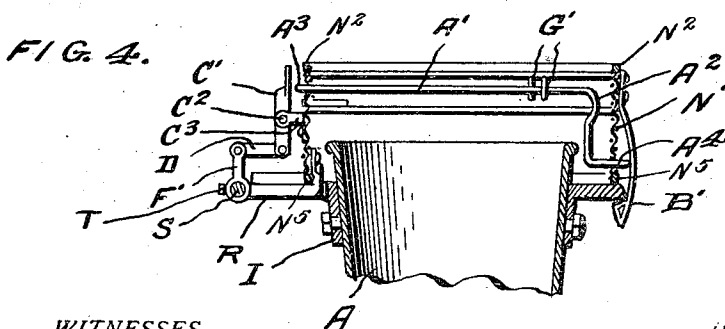
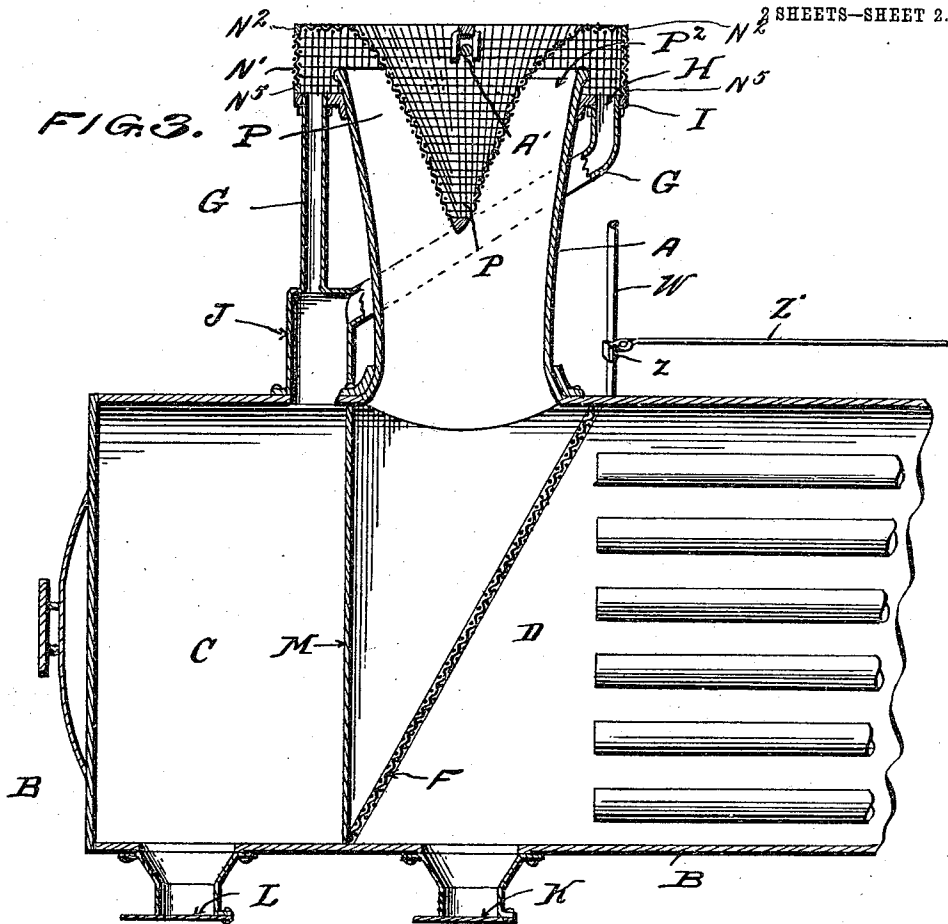
SPARK ARRESTER.

APPLICATION FILED JUNE 16, 1909.

950,048.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

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SPARK-ARRESTER.

950,048.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed June 16, 1909. Serial No. 502,612.

To all whom it may concern:

Be it known that we, JAMES F. LAVIN and VERN V. STEVENS, citizens of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Spark-Arresters, of which the following is a specification.

Our invention relates to spark arresters, particularly adapted for use on locomotives.

Among the objects in view is to provide a spark arrester adapted to prevent the escape of live sparks or cinders and thus avoid the consequent discomfort to passengers, and possible danger from fire resulting from contact of such live sparks with combustible material along the railway.

A further object is to simplify the construction and lessen the expense of manufacture of the device and its application to a locomotive.

The invention consists in the novel construction, arrangement and combination of parts as hereinafter fully described, illustrated in the drawings and pointed out in the appended claims.

In the drawings: Figure 1 is a perspective view showing the invention, applied to a locomotive smoke stack the wire gauze deflector or arrester being shown as swung down into opened or inoperative position. Fig. 2 is a perspective view of the upper part of the stack and showing the wire gauze deflector in closed or operative position on the stack. Fig. 3 is a sectional view of a portion of a locomotive boiler and its stack with the invention applied. Fig. 4 is a vertical sectional view of Fig. 2, parts being in elevation and the conical screen being omitted.

A indicates the smoke-stack of a locomotive, and B the boiler.

C is a chamber located in the front end of the boiler and adapted to receive the live sparks and cinders which would otherwise pass out through the stack. D is also a cinder receptacle or chamber in rear of chamber C and adapted to receive the larger cinders which would otherwise pass up into the stack.

F is a copper-clad steel wire gauze screen or partition arranged within the chamber D and arranged to intercept the larger cin-

ders in their passage to the stack, such larger cinders after striking the said screen F, falling to the bottom of the chamber D.

Our improved arrester comprises ducts or flues G of which there may be any desired number and whose upper ends connect with ports H formed in a collar or flange I carried by the smoke stack and bolted thereto slightly below its upper end. The flues G pass down and communicate with and discharge into a short extension or box J carried by the chamber C. Or said flues may discharge into any other suitably arranged cinder receptacle.

K and L are suitable doors provided at the bottom of the chambers C and D for the withdrawal of the cinders therefrom.

M is the dividing partition between the two chambers C, D.

N indicates a wire screen deflector or arrester which is removably arranged in the mouth of the stack and forms a cover therefor. The deflector comprises upper and lower annular metallic rings N², N³ respectively to which a copper-clad steel wire gauze N' is attached, and a copper-clad steel wire gauze P bent into cone shape is attached to ring N² also. The arrester N is so constructed as to adapt the circular portion to pass down over the upper end of the stack and seat upon the flange I, with the conical portion extending down within the stack, a narrow passage or duct P² being left between the upper edge of the stack and the cone for the passage of cinders to the ports H. The arrester is adapted to have a hinged or pivotal connection with the stack and for this purpose we provide the collar with laterally extending ears or lugs Q between which is arranged an arm R to which is attached the ring N³. The arm R is pivotally attached to the ears Q by means of a shaft S having bearings in said ears and in an arm S' on the collar. One end of arm R is fixedly mounted on the shaft S as by set-screw T so as to turn with the latter.

One end of the shaft carries a bevel gear wheel U which meshes with a similar gear wheel V mounted on the upper end of an inclined shaft W whose lower end seats in a socket W' in a curved strip X bolted to the base of the stack. The upper end of the shaft W has a bearing in an arm Y attached

to the collar. The shaft W is adapted to be turned by any suitable means, as for instance, by fixedly attaching an arm Z to one end of the shaft W, and attaching one end of a wire or cord Z', to the other end of the arm, said wire leading thence to the engineer's cab. When the arrester is in its opened position, *i. e.* swung off of the stack, as seen in Fig. 1 the parts will occupy the position seen in full lines in said Fig. 1. When it is desired to swing the arrester into operative position, a pull upon the wire in the direction of the arrow Fig. 1 to cause the shaft W to rotate from one half to three-quarters of a turn will cause the arrester to swing upwardly and seat itself upon the collar I.

For the purpose of locking the arrester when in its operative or closed position seen in Figs. 2 and 3 we provide suitable locking means operated automatically during the swinging movements of the arrester and preferably constructed and operating as follows: A' indicates a rod extending across the circular portion of the arrester and adapted to be shifted longitudinally and having bearings in the screen N'. The rod A' is bent at as A² and its end projects beyond the screen N' as at A³, A⁴. B' indicates a spring catch secured at one end to the screen N' and its opposite end being hooked to adapt it to engage beneath the lower edge of the collar I when the arrester is in closed position. The catch is so located as to be in a position to be struck by the projecting end A⁴ of the rod A' when the latter is shifted in one direction. C' indicates a lever pivoted at C² to ears C³ on the screen N' and to which lever one end of a link D is pivoted, the other end of which is pivoted to a crank F' which is rigidly secured on the shaft S. When the arrester is being raised from its opened position the lever C' will be caused to swing and strike the end A³ of rod A', shifting the latter longitudinally and causing its end A⁴ to bear against the catch B' pushing the latter outwardly and when the arrester is about at the end of its closing movement the lever C' will move away from the end A³ of rod A' when the spring catch will snap under the collar. When the arrester is being opened the lever C' will be operated to press again on the end A³ of the rod A' freeing the catch from the collar and when the arrester has about reached the end of its opening movement the lever C' will free the end A³ of rod A' allowing the catch to again spring into its normal position.

G' are guides carried by a cross-piece n secured to the ring N² and between which the rod A' is guided.

We preferably make all the screen sur-

faces of the invention of copper-clad steel wire which resists moisture and will not rust.

What we claim is:—

1. The combination with a locomotive smoke stack, of a collar carried thereby near its upper end and having passages therein, a spark arrester having pivotal connection with the collar, said arrester comprising a circular screen portion and a conical screen portion constructed to leave a passage between it and the upper edge of the stack, a longitudinally-movable rod carried by the arrester, a rotatable shaft carried by the collar, an arm secured at one end to the shaft and to the other end of which arm the arrester is secured, a lever pivotally mounted on the arrester and one end of which lever is adapted to bear upon the said longitudinally-movable rod to shift the same, an arm, one end of which is pivoted to the other end of said lever and the other end of said arm being secured to the said rotatable shaft, a spring catch carried by the arrester and adapted to be operated by the longitudinally-movable rod as described, and discharge flues communicating with the passages in the collar.

2. The combination with a locomotive smoke stack, a collar carried thereby near its upper end and having passages therein, of a spark arrester having pivotal connection with the collar, said arrester comprising a circular screen portion and a conical screen portion constructed to leave a passage between it and the upper edge of the stack, a longitudinally-movable rod carried by the arrester, a rotatable shaft carried by the collar, an arm secured at one end to the shaft and to the other end of which arm the arrester is secured, a lever pivotally mounted on the arrester and one end of which lever is adapted to bear upon the said longitudinally-movable rod to shift the same, an arm, one end of which is pivoted to the other end of said lever and the other end of said arm being secured to the said rotatable shaft, a spring catch carried by the arrester and adapted to be operated by the longitudinally-movable rod as described, and discharge flues communicating with the passages in the collar, a bevel gear wheel carried by the rotatable shaft, a bevel gear wheel on the latter shaft and meshing with the first gear wheel, an arm carried by the second shaft and an operating cord attached to the last-mentioned arm.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES F. LAVIN.

VERNE V. STEVENS.

Witnesses:

JOHN D. DENISON, Jr.,
J. V. WELSFORD.