

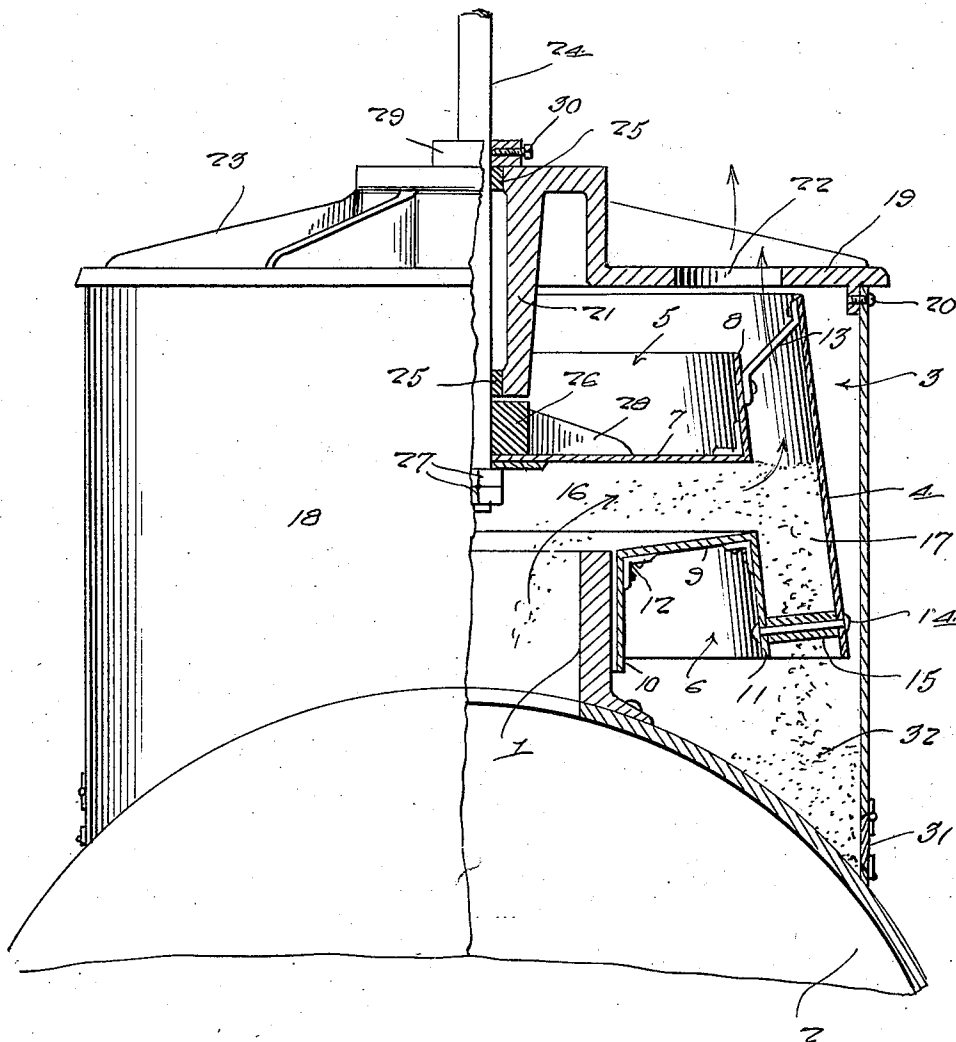
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SPARK ARRESTER

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SPARK ARRESTER.

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The present invention relates to improvements in spark arresters and has for its principal object to provide a simple and efficient device, for preventing the escape of the products of combustion which are discharged from the smoke conductor of a boiler or the like into the air, thereby preventing any danger of a fire.

One of the important objects of the present invention is to provide a spark arrester of the above mentioned character, wherein a suitable deflector encircles the discharge end of the smoke conductor and is adapted to receive the products of combustion emitted from the smoke conductor, the deflector member being of such construction as to cause the products of combustion to pass through said deflector member in a circuitous manner whereby the smoke will escape through the top of the deflector member, while the solid particles will be forced downwardly through the open lower end of the deflector member, a casing being arranged around the deflector member for receiving the solid particles, the casing being further closed at its upper end and formed with smoke emitting openings in the top thereof.

A further object is to provide a spark arrester of the above mentioned character, which will, at all times, be positive and efficient in its operation, the same being further of such construction as to permit the same to be readily and easily attached, without necessitating any material alterations of the parts of the smoke conductor or boiler with which the device is to be associated.

A still further object is to provide a spark arrester of the above mentioned character which is simple in construction, strong and durable, and further well adapted for the purpose designated.

Other objects and advantages of the invention will become apparent during the course of the following detailed description.

In the drawing, wherein for the purpose of illustration is shown the preferred embodiment of my invention.

The figure represents a view partly in elevation and partly in section of the spark arrester embodying my invention, showing the same attached.

In the drawing, wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates the usual smoke conductor pipe

which extends upwardly from the boiler 2 in the manner well known in the art. In the present instance the upper end of the vertically extending pipe 1 is cut-off and encircling the upper portion of this smoke conductor pipe 1 is the deflector member designated generally by the numeral 3.

This deflector member 3 is adapted for rotation around the smoke conductor pipe 1, and the same comprises the outer substantially frusto-conical shell 4, and the inner members 5 and 6 respectively. The inner member 5 is preferably pan shaped, the same including the flat base 7 and an upstanding annular flange 8. The other inner member 6 is substantially channel shaped and is of ring formation and the same comprises the base 9 and the inner and outer side forming annular flanges 10 and 11 respectively. Suitable bracing means, such as is shown at 12, is provided between the base portion 9 and the inner and outer flanges 10 and 11, in the manner clearly illustrated in the drawing. The base 9 of the substantially inverted channel shaped ring member 6 is disposed at an angle and the inner edge thereof is disposed adjacent the top of the smoke conductor pipe 1.

Suitable spacing members, shown at 13, extend between the outer side of the flange 8 of the pan like upper inner member 5 and the inner wall of the upper portion of the frusto-conical shell 4. The lower inner member 6 is spaced from the shell 4, through the medium of the radially extending bolts 14 and the spacing sleeves 15, which are arranged on the bolts and are disposed between the adjacent faces of the shell 4 and the inverted channel shaped member 6. As many of these bolts may be provided, as is desired.

Furthermore, the inner members 5 and 6 are spaced with respect to each other, whereby to provide a horizontal chamber or passage 16 and the same communicates with the substantially vertical passage 17, formed by the inner members 5 and 6 being spaced from the inner side of the shell 4.

Surrounding the rotatable deflector member 3 is the stationary cylindrical casing 18, the same being open at its upper and lower ends, and the lower end thereof being cut away to conform to the contour of the portion of the boiler 2 adjacent the smoke conductor pipe 1 and this casing may be secured on the top of the boiler in any appropriate

manner. A cover 19 is provided for the open upper end of this stationary casing 18 and the same may be secured on the casing in any suitable manner, such as is shown at 20.

This cover 19 has associated therewith at its central portion a depending housing 21, the lower end of the housing extending into the upper portion of the casing 18 and the pan like member 5 and as clearly shown in the drawing. The purpose of this shaft housing will be presently apparent. The cover is further formed with a series of smoke emitting openings such as is shown at 22 and reinforcing ribs 23 extend radially from the central portion of the cover to the outer edge thereof.

A rotatable shaft 24 extends downwardly through the housing 21 and the upper end of this shaft is adapted to be operatively connected to any suitable driving means, (not shown) whereby the shaft may be rotated. Suitable bearings 25 are arranged within the housing 21 for engagement with the shaft 24. The lower end of this shaft extends through a suitable block 26 secured on the central portion of the base 7 of the pan like member 5 and through the base of the pan like member. Suitable lock nuts 27 are threaded on the lower threaded end of the shaft 24 for operatively connecting the deflector member 3 with the lower end of the shaft so that the same will rotate therewith. Reinforcing ribs, such as are shown at 28 extend radially from the block 26 along the upper face of the central portion of the base 27 of the pan like member 5.

A collar 29 is secured on the upper portion of the shaft 24 by means of the set screw 30 and this collar is arranged directly above the top of the housing 21 to prevent the downward movement of the shaft.

The stationary cylindrical casing 18 is formed in the lower portion thereof with suitable clean out openings, the same being normally closed by reason of the swinging doors or closures 31.

The operation of my improved spark arrester may be briefly stated as follows:

Normally the parts are arranged as shown in the drawings. When the shaft 24 is rotated, the same will cause the deflector member 3 to also rotate, and as the deflector member operates, the products of combustion will, by suction, be drawn outwardly from the smoke conductor pipe 1, and these products of combustion will enter the horizontal chamber 16 and pass into the vertical chamber 17, and during such passage of the products of combustion, the same will strike the inner wall of the shell 4. This operation will result in the smoke passing upwardly between the upper inner member 5 and the shell 4, so that the smoke will be permitted to escape out through the passages or open-

ings 22, while the solid particles will drop downwardly between the inverted channel shaped inner member 6 and the lower portion of the shell 4 into the deposit chamber 32 formed by the lower portion of the cylindrical casing 18 and the adjacent portion of the boiler 2. The solid particles which collect within the chamber 32 can be readily removed therefrom by swinging the doors 31 upwardly, which normally close the cleanout openings provided in the lower side of the stationary casing.

In this manner, the products of combustion which are emitted from the smoke conductor pipe 1 will be subjected to a centrifugal action, whereby the solid particles will be separated from the smoke and the solid particles will be prevented from escaping out through the top of the arrester, thereby preventing any possibility of the parts or ashes escaping into the air and causing the fire.

The simplicity of my device enables the same to be readily and easily attached in position for association with the smoke conductor of a boiler or the like, and furthermore, the device will, at all times, be positive and efficient in carrying out the purposes for which it is designed.

While I have shown the preferred embodiment of my invention, it is to be understood that various changes in the size, shape and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In a spark arrester, the combination of the smoke conductor attached to a boiler, a rotatable deflector member encircling the upper portion of the smoke conductor and adapted to receive the products of combustion emitted from the smoke conductor, a stationary casing closed at its upper and lower ends enclosing the rotatable deflector member, the upper end of the casing being provided with smoke outlet openings, said rotatable deflector member comprising an outer shell open at its respective ends, upper and lower spaced inner members arranged within the shell to provide a horizontal passage for the products of combustion, said inner members being spaced from the shell to provide a vertical passage, the lower portion of the stationary casing being provided with clean out openings.

2. In a spark arrester, the combination of the smoke conductor attached to a boiler, a rotatable deflector member encircling the upper portion of the smoke conductor and adapted to receive the products of combustion emitted from the smoke conductor, a stationary casing closed at its upper and lower ends enclosing the rotatable deflector member, the upper end of the casing being pro-

vided with smoke outlet openings, said rotatable deflector member comprising an outer shell open at its respective ends, upper and lower spaced members arranged within the shell to provide a horizontal passage for the products of combustion, said inner members being spaced from the shell to provide a vertical passage, the lower portion of the stationary casing being provided with clean out openings, the lower inner member of the rotatable deflector being of substantially inverted channel shaped ring formation.

3. In a spark arrester, the combination of a smoke conductor attached to a boiler, a rotatable deflector member encircling the upper portion of the smoke conductor and adapted to receive the products of combustion emitted from the smoke conductor, a stationary casing closed at its upper and lower ends enclosing the rotatable deflector member, the upper end of the casing being provided with smoke outlet openings, said rotatable deflector member comprising an outer shell open at its respective ends, upper and lower spaced inner members arranged within the shell to provide a horizontal passage for the products of combustion, said inner members being spaced from the shell to provide a vertical passage, the lower portion of the stationary casing being provided with clean out openings, the lower inner member of the rotatable deflector being of substantially inverted channel shaped ring formation, the upper inner member being in the form of a pan.

4. In a spark arrester, the combination of the smoke conductor pipe that extends upwardly from a boiler, a rotatable deflector member encircling the pipe and adapted to receive the products of combustion emitted from the smoke conductor pipe, a stationary casing closed at its upper and lower ends and enclosing the rotatable deflector member, the upper end of the casing being provided with smoke outlet openings, said rotatable deflector member comprising an

outer shell open at its respective ends, an inverted channel shaped annular member encircling the upper portion of the pipe and being fixedly secured to the lower portion of said shell, a pan shaped member fixedly secured in the upper portion of said shell and being spaced from the upper end of the smoke conductor pipe and said annular member to provide a horizontal passage for the product of combustion, said members being spaced from the shell to provide a vertical passage, the lower portion of the stationary casing being provided with clean out openings.

5. In a spark arrester, the combination of the smoke conductor pipe that extends upwardly from a boiler, a rotatable deflector member encircling the pipe and adapted to receive the products of combustion emitted from the smoke conductor pipe, a stationary casing closed at its upper and lower ends and enclosing the rotatable deflector member, the upper end of the casing being provided with smoke outlet openings, said rotatable deflector member comprising an outer shell open at its respective ends, an inverted channel shaped annular member encircling the upper portion of the pipe and being fixedly secured to the lower portion of said shell, a pan shaped member fixedly secured in the upper portion of said shell and being spaced from the upper end of the smoke conductor pipe and said annular member to provide a horizontal passage for the product of combustion, said members being spaced from the shell to provide a vertical passage, the lower portion of the stationary casing being provided with clean out openings, and a rotatable drive shaft extending downwardly through the top of the stationary casing and operatively secured at its lower end to said pan-shaped member to effect the rotation of the deflector.

In testimony whereof I affix my signature.

OTTO F. MUHLBERG.