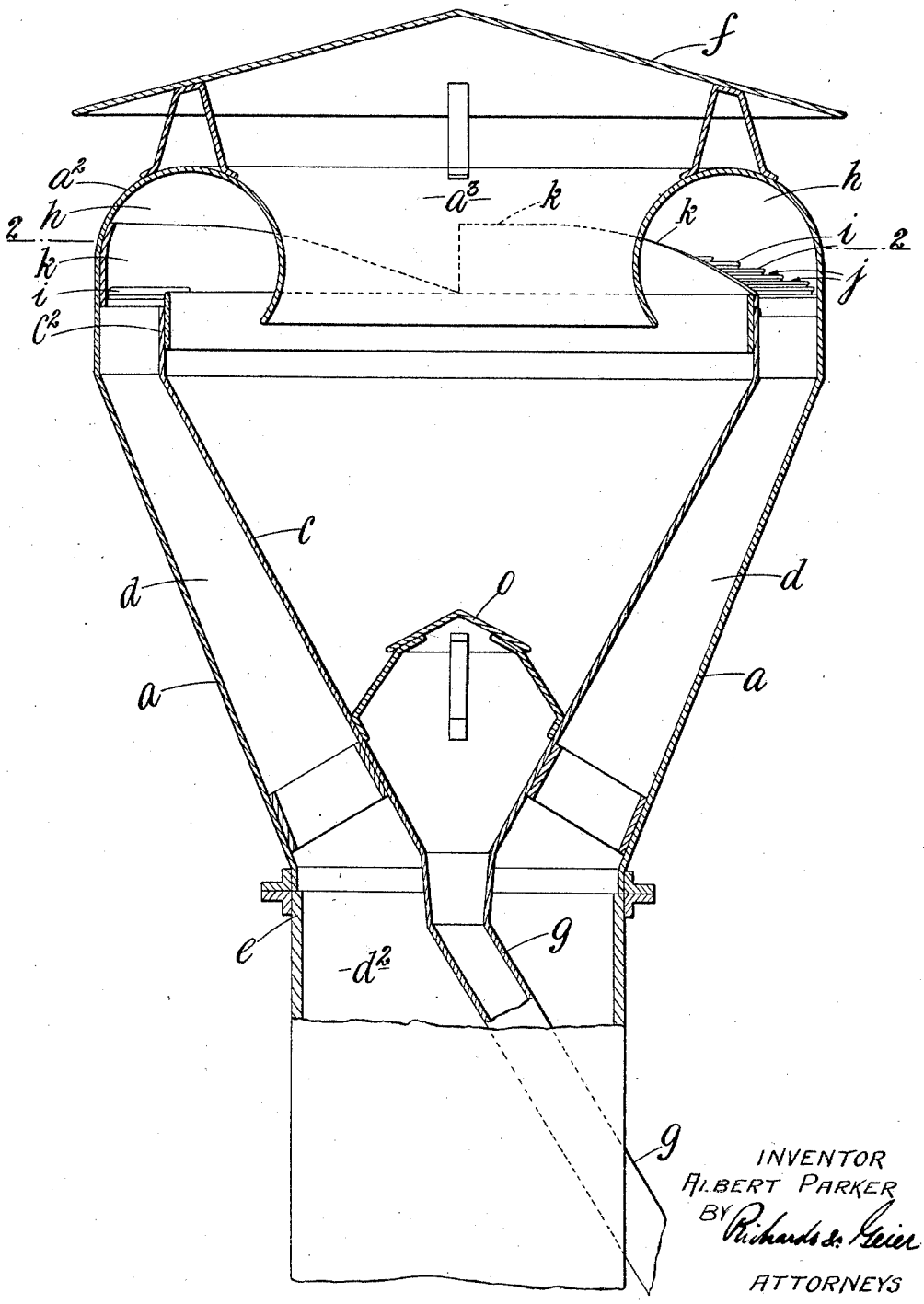
Dec. 10, 1929. A. PARKER 1,739,014

GRIT CATCHER

Filed Oct. 25, 1927 2 Sheets-Sheet 1

Fig. 1.



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Filed Oct. 25, 1927 2 Sheets-Sheet 2

Fig. 2.

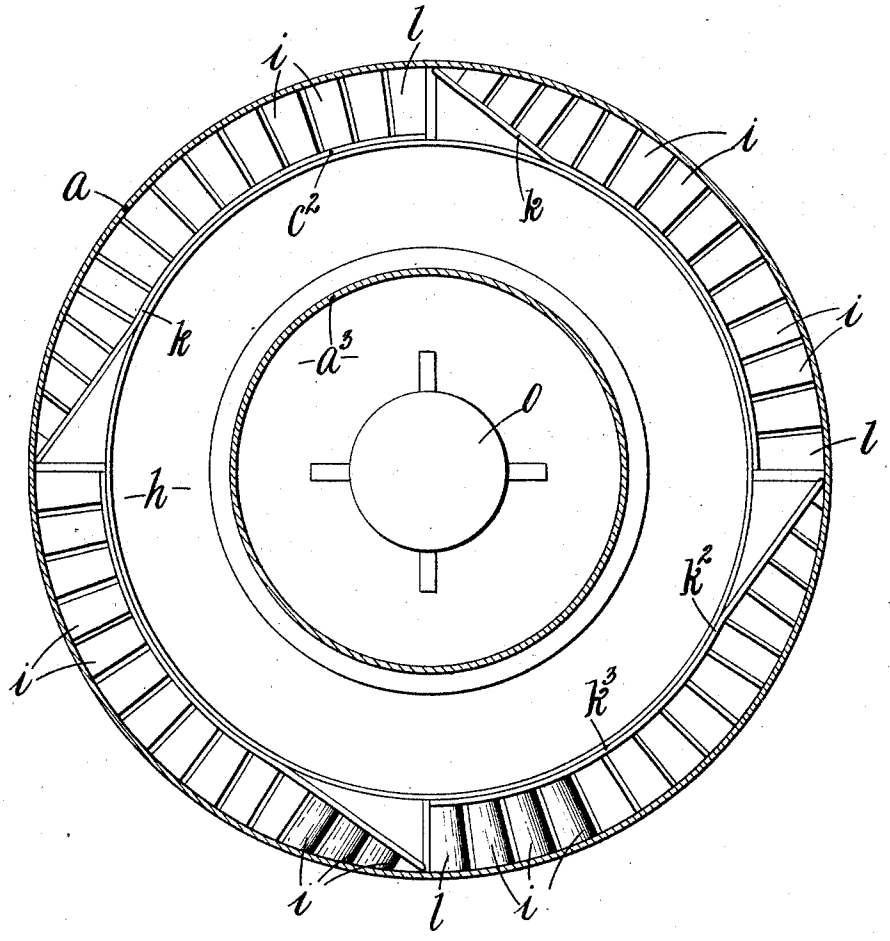
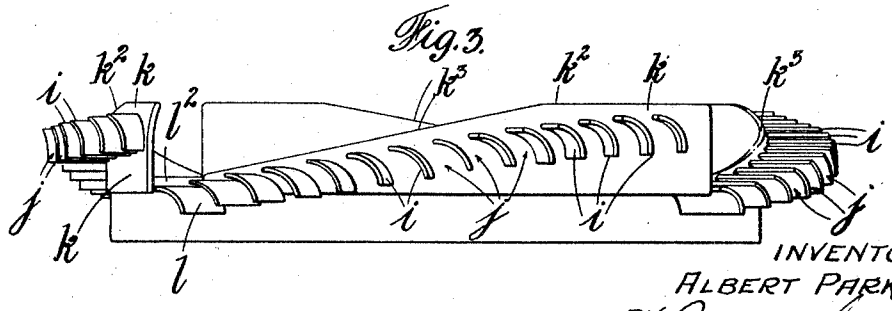


Fig. 3.



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UNITED STATES PATENT OFFICE

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GRIT CATCHER

Application filed October 25, 1927, Serial No. 228,539, and in Great Britain October 27, 1926.

This invention relates to improvements in apparatus for separating grit, dust and the like from smoke or gases and more especially to a particular kind of apparatus commonly known as a grit catcher adapted to be fixed to the outlet, face, or at any intermediate position in a chimney or flue.

The type of apparatus to which my invention refers comprehends an outer casing within which is a centrally and vertically disposed funnel shaped member relatively fixed in relation to the casing so as to provide between itself and the casing an annular space. At the lower end of the casing an inlet for smoke or gas is provided and at the top of the casing an expansion space is formed and also a central outlet pipe dipping into the funnel shaped member aforesaid while a down pipe leads from the bottom of said member to the exterior. The apparatus functions to permit the smoke or gases to be treated to pass upwardly in the annular space between the casing and the funnel-shaped member, then downwardly thereinto, and then upwardly through the central outlet pipe but before the smoke or gases pass through the central outlet pipe they are cleaned or deprived of the whole or greater part of the dirt and grit in suspension by being caused to pass through a ring of spaced vanes or blades within the expansion space referred to, or in the front of the entrance to the funnel-shaped member. The smoke or gases are thereby caused to pass into and from the expansion space and into said member at the top of the latter. Due to said vanes, the gases are made to whirl into said member and to descend while continuing to whirl and expand, and the dirt and grit fall into said member and are directed away by the down pipe proceeding from the bottom thereof.

The present invention aims at separating the grit from the smoke or gases so that it quickly falls into the catcher after the whirling action occasioned by its contact with the vanes or blades has been produced. Accordingly I provide one or more diverting walls to function in co-operation with the ring of vanes or blades aforesaid, said walls being disposed to cross the ring of vanes or blades so that after the smoke or gases have been subjected to the whirling action they are more quickly carried into the mouth of the catcher where further expansion occurs. The solid particles in suspension will then fall into the catcher and be directed away by the down pipe proceeding from the lower end of the funnel-shaped member.

Said diverting walls are preferably vertical in elevation and in plan are tangentially arranged or curved in relation to the ring of vanes or blades and cross same from the outside to the inside. In one form of the invention the ring of blades may be provided upon the diverting walls and the curved continuation thereof so that the termination of one series of vanes on a particular diverting wall meets the commencement of a similar diverting wall, it being desirable to arrange even numbers of walls so that the termination of one is contiguous to the commencement of the succeeding wall.

The depth of the diverting walls varies, is deeper at the external width dimension of the vanes or blades, and of least depth at the internal width dimension of said vanes or blades and, in the practice of the invention, it is desirable to build the rings of vanes aforesaid spirally in elevational relation to the apparatus, that is to say, there would be four substantial spirals if four independent diverting walls were utilized said blades also being inclined so that in plan they are of substantially radial appearance.

An example of the invention is diagrammatically illustrated by the accompanying drawings upon which similar letters of reference denote corresponding parts throughout the several views.

Fig. 1. is a sectional elevation.

Fig. 2. is a diagrammatic sectional plan of Fig. 1, taken on the dotted lines 2—2.

Fig. 3. is a diagrammatic elevation of a ring of vanes fitted with the improvements.

a is the outer casing of the apparatus within which a vertically disposed funnel-shaped catcher *c* is centrally fixed to collect grit or the like from smoke and gases.

The size and mounting of the catcher *c* provides an annular space *d* between the ex-

terior walls thereof and the inner walls of the casing a in which space gases flow from an inlet d^2 at the lower end of the casing, the said inlet being fixed to the top of a chimney or flue e.

The catcher c has a rim c^2 and the casing a extends a considerable distance above this rim and is covered in at the top a^2 except for a rigidly depending central outlet pipe a^3 which depends a distance into the catcher c. As will be seen, said outlet pipe a^3 is approximately of the same diameter as the inlet d^2.

In the diagram illustrated, the apparatus is utilized as a cap or terminal to a chimney or flue and the outlet a^3 has a weather hood f incorporated therewith. However if the apparatus is applied at the base of the chimney or flue, or at any intermediate position therein, the outlet pipe continues to an upper stretch of the chimney or flue.

The bottom of the catcher c communicates with a down pipe g which conveys collected grit or other solid matter in suspension in the gases away from the catcher.

The walls of the casing a are relatively inclined in the same direction as those inclined walls of the catcher with the idea of maintaining the smoke or gases at the same rate of flow up the annular space d until they reach a much larger space h above the rim of the catcher member where expansion thereof occurs.

Between the expansion space h at the top of the casing a and the entrance from the annular space d, a ring of spaced curved vanes or blades i is provided, the latter forming therebetween the spaces j which will impart a whirling action to the flow of the smoke or gases entering the expansion space h and passing into the catcher c. This whirling of the suspended grit into the catcher from the top thereof will cause said grit to impinge against the inner walls of said catcher and, adjacent the bottom, be directed away by the down pipe g.

The invention incorporates with the aforesaid ring of spaced vanes or blades i one or more diverting walls k which, as will be particularly seen in Figs. 2 and 3, are vertical in elevation but tangential or inclined in relation to the ring of vanes aforesaid.

Said diverting walls k are arranged to cross the vanes i from the outside to the inside so that grit passing between the vanes or blades with a whirling action will, after a short period of time, strike the diverting walls k which results in the suspended matter being quickly carried into the top of the catcher c.

It will be appreciated that the said diverting walls k, while permitting of the upward flow of the whirling smoke or gases through the co-operation of the vanes, also function to quickly divert said smoke or gases into the top of the catcher and thereby prevent any back pressure that is likely to be formed.

The depth of the diverting walls k varies being deeper at k^2, and gradually narrows in depth as at k^3 towards the commencement of the tangential disposition of the walls k.

It is practicable also to arrange the series of blades on each diverting wall in spiral formation, as best seen in Fig. 3, the vanes, in such case, still forming a ring but declining from one end of the associated diverting wall to the other end thereof. Adjacent the lower vane l of one diverting wall, and the commencement of the next diverting wall, a web l^2 is formed which may be slightly inclined and in reality constitutes a continuation of the vanes, said web serving the dual purpose of connecting the diverting wall to the ring and also preventing any dust or grit, after it has been subjected to the whirling process, from falling into the space d.

As will be seen from Fig. 3 of the drawings, the various blades i are slightly inclined and are of a radial stepped formation.

Disposed centrally within the catcher c and near the bottom thereof is fixed a horizontal conical disc o to prevent the grit collected in the bottom of the catcher from rising at the centre towards the outlet a^3 and thus hindering the collection of the grit aforesaid.

Briefly, the action of the apparatus is as follows: Grit-laden gases or smoke ascend the annular space d and pass through the vanes which, being curved, divert the gases or smoke to horizontally circular motion so that they revolve above the vanes in the expansion space. But in consequence of the diverting walls k said revolution of the gases or smoke cannot be concentric above the vanes, they being directed towards the centre of the apparatus, so that they may freely flow downwardly into the catcher c and then away to the outlet a^3, the grit separating out in said catcher.

Having now described my invention, what I claim and desire to secure by Letters Patent is—

1. Grit catcher, combining a circular and vertical outer casing of cone shape closed at its upper end except for a depending central outlet, said casing being adapted at its lower end for attachment to a vertical pipe, a catcher member centrally disposed within the casing to project by its upper edge above the lower edge of the outlet and to leave an annular space between itself and said casing and between its upper edge and the outlet, a horizontal ring including spaced, curved vanes fixed between the upper edge of the catcher member and the opposite walls of the casing, and vertically arranged diverting walls between the upper edge of the catcher member and the inner diameter of the ring

of vanes, said walls crossing some of the vanes.

2. Grit catcher, combining a circular and vertical outer casing of cone shape closed at its upper end except for a depending central outlet, said casing being adapted at its lower end for attachment to a vertical pipe, a catcher member centrally disposed within the casing to project by its upper edge above the lower edge of the outlet and to leave an annular space between itself and said casing and between its upper edge and the outlet, a horizontal ring including spaced curved vanes fixed between the upper edge of the catcher member and the opposite walls of the casing, said vanes being arranged in inclined or spiral series, and vertically arranged diverting walls between the upper edge of the catcher member and the inner diameter of the ring of vanes, said walls crossing some of the vanes.

In testimony whereof I have affixed my signature.

ALBERT PARKER.