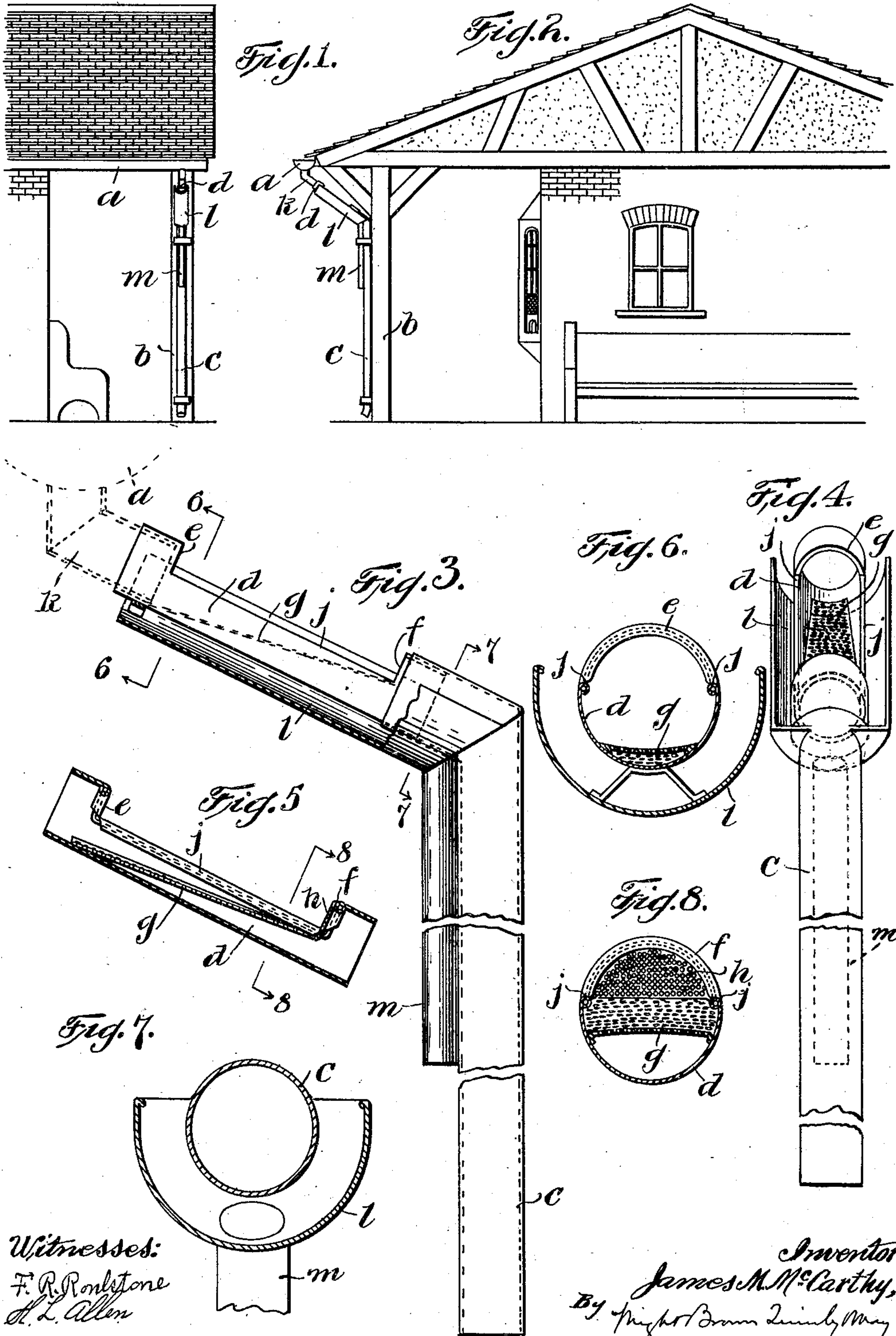


J. M. McCARTHY.
SEPARATOR FOR DRAIN PIPES.
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Patented May 9, 1911.



Witnesses:
F. R. Ronkstone
H. L. Allen

Inventor:
James M. McCarthy;
By *Frederic Brown* *Quincy May*
Attys.

UNITED STATES PATENT OFFICE.

JAMES M. McCARTHY, OF WALTHAM, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO
JOHN W. McMANAMA, OF WALTHAM, MASSACHUSETTS.

SEPARATOR FOR DRAIN-PIPES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES M. McCARTHY, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Separators for Drain-Pipes, of which the following is a specification.

The object of the present invention is to provide means adapted for use with the leader pipes which carry away the rain water drained from the roofs of buildings, particularly such as are located near railway lines, as railway stations, etc., for the purpose of separating such cinders and dust ejected from locomotive engines as have been deposited on the roofs and washed into the drain by the rain water, from the water so as to prevent clogging of the gutters, leader pipes and drains.

The device in which the invention is embodied is adapted to be set at any point in the course of the downwardly extending pipe systems wherever used for carrying away surface drainage which is liable to be mingled with cinders as above noted, or any other finely divided solid matter.

It consists of a conduit having means for separating the solid matter from the water, and constructed with provisions for permitting the solid matter to escape outside of the pipe or for removing the solid matter from the pipe and conducting it separately to a suitable depository.

In the accompanying drawings I have illustrated the preferred construction of a separating device embodying the essence of my invention, illustrating as well the manner of its employment.

In the drawings, Figures 1 and 2 represent views as seen from directions at right angles to each other of a separator embodying my invention applied to the water leader of a railway station house. Fig. 3 is an elevation of a device on an enlarged scale showing the same view of the device as illustrated in Fig. 2. Fig. 4 is an elevation of the part shown in Fig. 3 as seen from the right of Fig. 3. Fig. 5 is a longitudinal section of the separator detached from the leader pipe. Fig. 6 is a section enlarged on line 6—6 of Fig. 3. Fig. 7 is a section enlarged on line 7—7 of Fig. 3. Fig. 8 is a section enlarged on line 8—8 of Fig. 5.

Referring to the drawings, *a* represents a gutter such as is usually placed at the edge

of any roof to catch the rain water drained from the roof. In this drawing the gutter is supposed to be applied to the roof of a railway station house.

b represents a post supporting the part of the roof which overhangs the station platform, and *c* is a leader pipe secured to the post for carrying away the water drained into the gutter.

Between the gutter *a* and the leader pipe *c* is an inclined conductor, a part of which is the device in which my present invention is embodied.

The separator itself as shown best in Figs. 3, 4 and 5, is a conduit *d*, which is designed to be placed when in use at an inclination, somewhat as shown in these figures, in order to permit a free course of the water through it, without causing the water to overflow at its edges. The upper side of the conduit is cut away to permit the escape of the cinders, the cut-away part extending between the points *e* and *f*. Across the conduit is a diagonally arranged screen or strainer *g*, which is joined to the bottom of the conduit near the upper end thereof, and extends diagonally toward the other end, terminating at the end *f* of the opening in the conduit. Across the space between this end of the screen and the sides of the conduit is a second screen *h*. These two screens are secured to the walls of the conduit so as together to form a perforated partition crossing the passageway of the conduit, by which particles of solid matter are arrested and prevented from being carried by the water through the conduit. The disposition of the partition, however, is such with respect to the opening in the upper side of the conduit as to permit the cinders to escape and thus prevent formation of a dam, and clogging of the conduit. The inclination of the conduit is such that preferably the screen *h* also extends on a downward slant, whereby the cinders are forced by the flow of the water and their own accumulation toward the end *f* of the opening. The screen *g*, however, rises about to the level of the sides *j* at the point where it joins the second screen *h*, so that the accumulated cinders can easily fall away out-side of the conduit.

This separator may be placed at any point where the nature of the leader pipes permits the insertion of an inclined pipe section. The most convenient position for its

use is perhaps that illustrated in the drawings, where is it applied as the connector between the gutter at the eaves of the roof and a leader pipe supported by a post some distance from the eaves. An elbow connection *k* here leads from the gutter to the separator, and a similar elbow on the upper end of the pipe *c* is connected to the lower end of the separator. However, it is not essential that the separator be placed at this point, as it might be arranged at the bottom of the upright leader, and near where the latter discharges into a drain, or it might be located between two sections of the vertical pipe, offset far enough to permit the separator to be placed between them.

While I do not limit myself to any particular size for the parts of the separator, I have found in practice that a separator in which the conduit portion is about four inches in diameter and the screen a foot or fifteen inches in length, gives perfect satisfaction.

The screen *h* is an important adjunct of the separator, since it causes the cinders to be separated from the water without clogging the separator, and without causing any material loss of the water. The cinders and other solid matter being as previously described carried by the flow of the water toward the lower end of the screen *g*, are arrested by the screen *h* and while so arrested are raised in contact with the screen *h* by the pressure of the water and other solid particles, to a height above the sides *j* of the opening of the conduit, whereby they can fall freely from the conduit. The fact that the screen *g*, while being arranged on a downward slant, is less sharply inclined than the separator as a whole, is another important feature of the invention and one which differentiates it sharply from other separators. This disposition of the screen causes the solid particles to be removed from the water and allows practically all of the water to pass through the screen without deflecting the stream of water and causing it to overflow the sides of the opening in the separator. This is due to the fact that the gravity velocity of the water caused by the pitch of the conduit is greater than the gravity velocity corresponding to the pitch of the screen.

Another important feature of the inven-

tion is the provision which I have made for the disposition of the cinders and other solid matter removed from the water. For this purpose I provide a cinder collector which is a tubular member *l* surrounding the separator either completely or partially, and at least to a sufficient extent to enable it to catch the cinders and other solid particles which fall from the screen. At the lower end of the collector is a conduit or conductor pipe *m* which extends downwardly and receives the cinders which are caught by the collector section *l*. If desired this conductor *m* may be stopped at the bottom so that it serves not only as a conduit but also as a receptacle for the cinders. Otherwise the conductor may be arranged to discharge into any suitable depository.

I claim,—

1. In a water leader a separator for straining particles of solid matter from the water, comprising a conduit forming a section of the leader and arranged on a slant, said conduit having its upper side cut away, and a screen crossing the conduit diagonally from the wall of the conduit near the upper end of said cutaway portion to the lower end of the cutaway portion, and a second screen of segmental form crossing the end of the cutaway portion, being joined at its outer edges to the walls of the conduit and at its inner edge to the end of the first-named screen.

2. An automatic separator for purposes of drainage and filtration comprising a conduit arranged on a slant having provisions for admission and discharge of water at its ends and an opening in its upper side, a screen extending from the lower side across the conduit to the lower end of the cutaway portion of the latter and approximately to the height of the side edges thereof, and a second screen closing the end of such cutaway portion, and arranged at an abrupt angle with respect to the first screen, whereby solid particles carried longitudinally of the first screen are arrested by the second screen and caused to rise until they pass over the sides of the conduit.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JAMES M. McCARTHY.

Witnesses:

JAMES T. COPSON,
HARRY L. FRENCH.