No. 738,745. PATENTED SEPT. 8, 1903

A. C. McCORD.

AIR DUCT.

APPLICATION FILED NOV. 5, 1898.

NO MODEL.

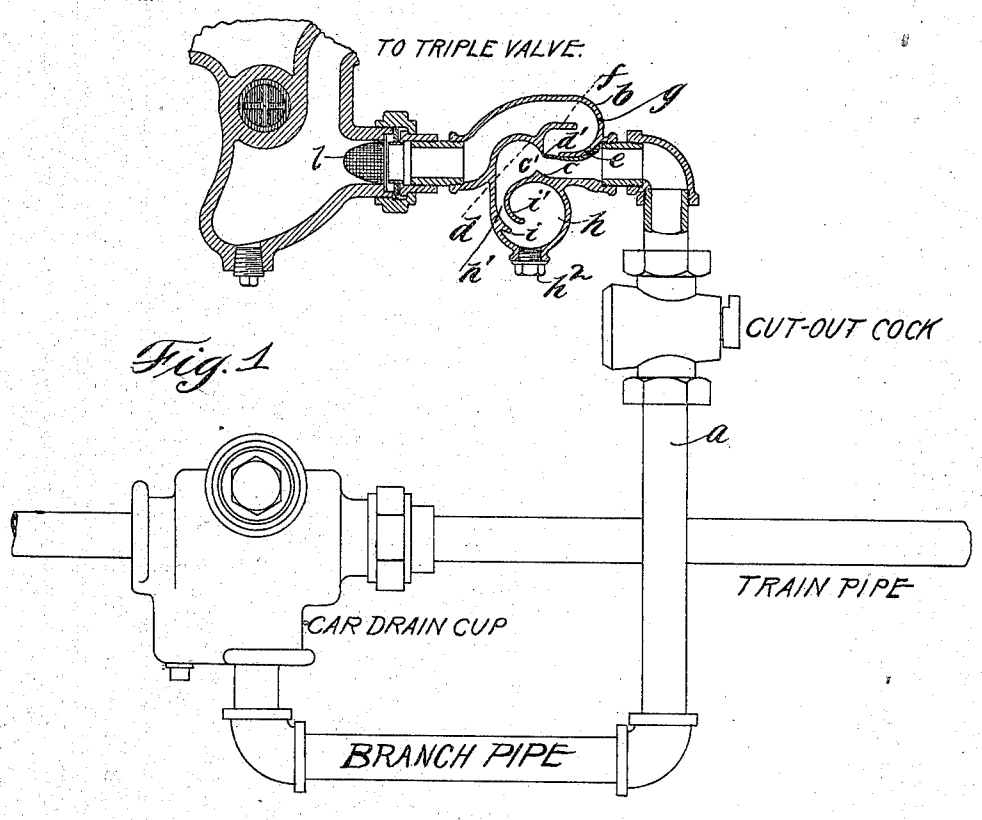


Fig. 1

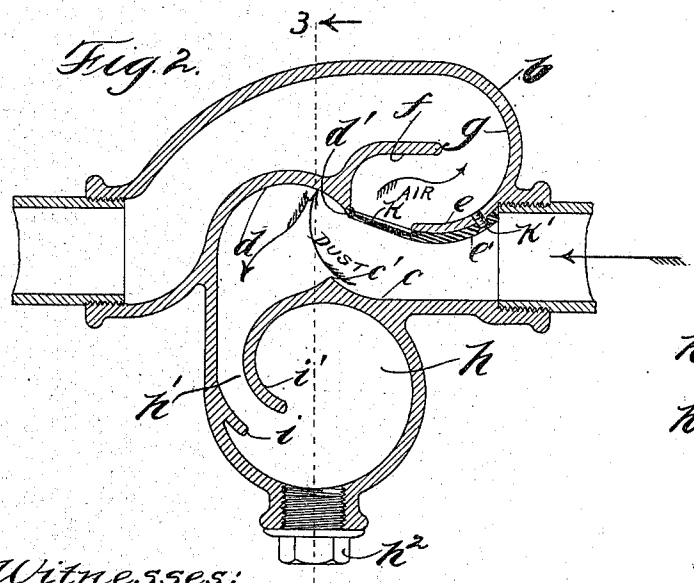


Fig. 2.

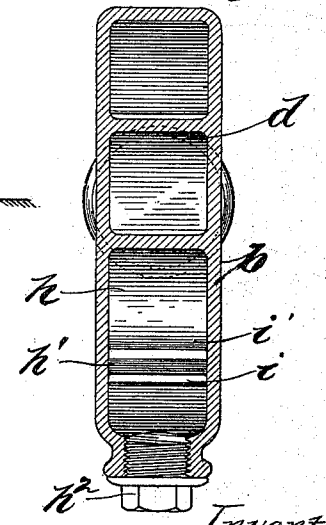


Fig. 3.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 738,745. Patented September 8, 1903.

UNITED STATES PATENT OFFICE.

ALVIN C. McCORD, OF CHICAGO, ILLINOIS.

AIR-DUCT.

SPECIFICATION forming part of Letters Patent No. 738,745, dated September 8, 1903.

Application filed November 5, 1898. Serial No. 695,586. (No model.)

To all whom it may concern:

Be it known that I, ALVIN C. McCORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Air-Ducts, (Case No. 4,) of which the following is a full, clear, concise, and exact description.

My invention relates to means for removing dust, particles of water, &c., from air, and has for its object the provision of improved means for accomplishing this work in greater part without the aid of screens or strainers.

The device of my invention consists in directing and deflecting surfaces interposed in the path of the air, which serves to separate the foreign matter from the flowing stream of air.

Another feature of the invention may generally be described as consisting in a pipe or duct having a passage extending in one direction to a pocket and provided with an opening located to one side of said passage, whereby the foreign matter by its momentum will be directed to the pocket, the air following another path through said opening.

In the preferred embodiment of my invention I convey the air through a duct, upon the interior whereof is provided a directing plate or surface, a deflecting-plate being so located with reference to the directing-plate that particles of dust, &c., are thrown against the deflecting-plate, from which they rebound into a receptacle or pocket, which I preferably provide in connection with the air-passage. The air by means of the directing-plate and the shape of the passage through which it flows is caused to circulate in curved paths, the dust and other particles of foreign matter being directed by the aforesaid curved directing-surface against the deflecting-surface.

The device of my invention is of particular utility in connection with air-brake systems, the device serving thoroughly to remove the particles of foreign matter flowing through the train-pipes to prevent the foreign matter from reaching nicely-adjusted working parts. The invention, however, is also adapted for use in other connections.

Heretofore in air-braking apparatus strainers have been employed for cleaning the air. These strainers in the course of time become choked with the dirt, which lodges thereon to such an extent that the free passage of air is prevented, the strainers frequently being blown from their fastenings. In applying my invention to existing air-braking apparatus these strainers may be retained, but injury thereto is prevented by my devices.

I will explain my invention more particularly by reference to the accompanying drawings, in which—

Figure 1 is a plan view of a portion of apparatus employed in connection with air-brakes, the arrangement of the parts being diagrammatically illustrated, the device of my invention and parts immediately connected therewith being shown in section. Fig. 2 is a detail sectional view of my improved device. Fig. 3 is a sectional view on line 3 3 of Fig. 2.

Like letters indicate like parts throughout the different figures.

The particular apparatus which is diagrammatically illustrated in Fig. 1 is used in the well-known air-braking systems, in which the brakes are operated through the agency of compressed air, the air within the train and branch pipes being normally under pressure. In coupling and uncoupling sections of the train-pipe dust and other foreign matter is likely to enter the pipe, this foreign matter being conveyed through the branch pipes by the air as it is forced toward the triple valves. Strainers placed in the branch pipes have heretofore been relied upon to prevent the foreign material from reaching the triple valves.

The device of my invention when employed in connection with air-brake appliances is preferably included in the branch pipe *a* upon each car, communicating with the main train-pipe. The preferred form of my improved device is in the form of a section of pipe *b*, open at both ends and provided with a curved directing-surface *c*, preferably placed at the bottom of the pipe or duct, and a deflecting-surface *d*, which is also preferably curved and located opposite and beyond the surface *c*, the deflecting-surface beginning opposite the point where the directing-surface ends. A nose or continuation *d'* of the deflecting-surface preferably extends beyond the nose *c'*, the deflecting-surface thus intercepting that portion of the stream of air which conveys the particles of foreign matter and

directing the foreign matter to one side. An opening is provided over the curved directing-surface and immediately adjacent to the deflecting-surface through which that portion of the stream of air which is likely to carry little or no foreign matter passes. I preferably provide a directing portion or plate *e* adjacent to the aforesaid opening and preferably located immediately over the surface *c*. A directing-surface *f* is provided above the surface *c* and opposite the opening between the deflecting-surface *d* and the directing portion *e*. The portion *g* of the wall of the duct is preferably curved. The directing surfaces or portions *e*, *f*, and *g* coöperate to cause the air to follow a sinuous path through the pipe *b*. The particles of foreign matter, being comparatively heavy, will be thrown by centrifugal force toward the outer or longer edge of the stream of air or that edge at the directing-surface *c*, and these particles continuing in their curved path will strike the deflecting-surface *d*, from which they rebound out of the path of the air. I provide a pocket *h* to receive the particles of dust as they are deflected. Foreign matter which is not cast against the deflecting-surface by centrifugal force will be carried past the opening at K by its momentum. This pocket is provided with an opening *h'*, communicating with the duct *b*, the foreign matter falling through this opening into the pocket. A plug h^2 is provided, which is withdrawn when the accumulations within the pocket are to be removed.

To prevent the foreign matter from returning to the flowing stream of air, I provide projections *i i'* within the pocket, which serve to prevent the passage of the foreign matter as it circulates from the pocket, the curved projection or guiding-surface *i'* adjacent to the opening *h'* serving to direct the foreign matter in a curved or circular path within the pocket, the inward projection *i* upon the lower wall of the pocket and located at the mouth of the opening *h'* serving to catch any particles that may be circulating near the lower portion of the pocket toward the pipe or duct *b*. In case any foreign matter happens to escape the deflecting-face *d* I provide a screen or strainer *k*, located in the opening between the portions *d' e*, which is preferably fastened, by means of screws *k'*, to the wall of the pipe. The location of this strainer with reference to the direction of flow of the air is such that when air flows in the branch pipe foreign particles which may previously have accumulated upon the lower surface of the strainer are blown toward the pocket *h*. The strainer *l* heretofore employed may be retained, if desired.

It will be observed that the passage in the preferred form of my improved fitting through which the air is conveyed to the triple valve lies substantially in a single plane and preferably also in the same plane with the contiguous portions of the train-pipe between which the fitting intervenes. The portion or branch of the passage leading to the opening K from the train-pipe is angularly disposed with relation to that portion or branch of the passage extending from the opening K toward the triple valve. The opening K is substantially parallel with and extends longitudinally of the first aforesaid portion of the passage, so that the current of air may be turned to one side through said opening, while foreign matter passes by the same into the receptacle beyond.

It will be observed that I have provided a pipe having three branches, two of which are angularly disposed with relation to each other and together constitute an air-channel, while the third is preferably substantially closed to prevent passage of air, but which is adapted to receive foreign matter that may pass with the air along one of the branches, the foreign matter, owing to its momentum, being prevented from following the devious path of the air in passing from this branch, owing to the angular relation of the branches of the pipe through which the air is passed. In order the more effectively to prevent the foreign matter that may have settled in the closed branch of the pipe from being agitated after lodgment, this branch is preferably angularly disposed with relation to that branch of the pipe first admitting the air.

While I have shown and particularly described the application of my invention to an air-braking system, it is obvious that it may be employed in other connections. Changes may be readily made without departing from the spirit of my invention, and I do not, therefore, wish to be limited to the precise construction shown; but,

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

1. The combination with an air-duct provided with a directing-surface *c* and a deflecting-surface *d*, the directing-surface serving to direct air containing foreign material against the deflecting-surface, of a pocket *h* provided with a curved wall or surface *i'* upon its interior and having a projection *i* extending toward the interior of the pocket and located at the outside wall of the pocket, and having a communicating opening or passage-way located adjacent to the said deflecting-surface, which surface serves to deflect the foreign material into the pocket through said opening, said curved wall or surface within the pocket serving to direct the foreign material in curved paths within the pocket to prevent the same from being returned to the duct, the projection *i* serving to prevent the foreign matter at the outer wall of the pocket from passing to said duct, substantially as described.

2. An air-duct provided with a directing-surface *c* and a deflecting-surface *d* projecting beyond the directing-surface and extending within the passage of the duct, said di-

recting-surface being curved and extending toward the deflecting-surface, whereby the foreign matter is thrown toward the outer edge of the current of air and carried toward the deflecting-surface by centrifugal force, substantially as described.

3. The combination with an air-duct provided with a directing-surface *c* and a deflecting-surface *d* in a passage portion, the directing-surface serving to direct air containing foreign material against the deflecting-surface, an opening K extending longitudinally of the said passage portion and having communication therewith, of a pocket *h* provided with a curved wall or surface *i'* upon its interior and having a communicating opening or passage-way *h'* located adjacent to the said deflecting-surface, which surface serves to deflect the foreign material into the pocket through said opening, said curved wall or surface within the pocket serving to direct the foreign material in curved paths within the pocket to prevent the same from being returned to the duct, substantially as described.

4. An air-duct provided with a directing-surface *c* and a deflecting-surface *d* placed opposite the directing-surface and projecting into the passage of the duct beyond the directing-surface, the directing-surface serving to direct air containing foreign material against the deflecting-surface, the latter surface serving to deflect the foreign material from the flowing current of air, and a pocket for receiving the foreign material, substantially as described.

5. The combination with an air-duct, of a dust-pocket into which the air-duct opens, and a second or supplementary air-duct communicating with the first-mentioned air-duct in advance of the pocket, whereby the dust and similar matter is carried by the opening to the supplementary air-duct into the pocket while the air escapes into said supplementary duct, substantially as described.

In witness whereof I hereunto subscribe my name this 3d day of November, A. D. 1898.

ALVIN C. McCORD.

Witnesses:

GEORGE L. CRAGG,

WINFIELD W. LEACH.