

No. 873,532.

PATENTED DEC. 10, 1907.

G. H. FORSYTH.  
DUST COLLECTOR.  
APPLICATION FILED APR. 2, 1906.

Fig. 1.

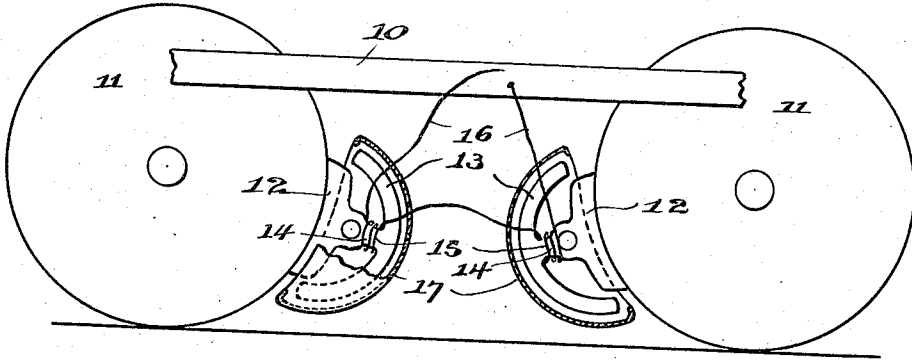


Fig. 2.

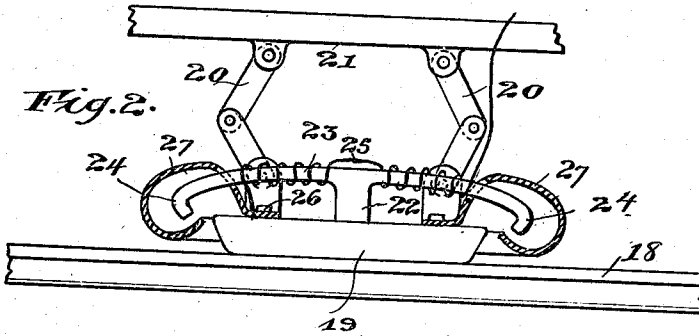
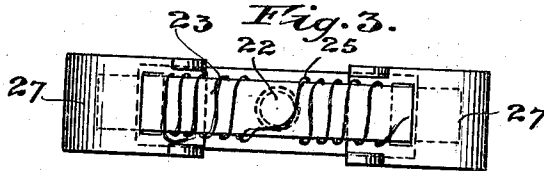


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## DUST-COLLECTOR.

No. 873,532.

Specification of Letters Patent.

Patented Dec. 10, 1907.

Application filed April 2, 1906. Serial No. 309,463.

*To all whom it may concern:*

Be it known that I, GEORGE H. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a specification.

This invention relates to dust collecting devices, and pertains more particularly to means for collecting and retaining metal dust produced by abrasion and wear between two or more metallic contact surfaces. Well known instances in which dust of this character is produced may be found in the wear of brake shoes upon the wheels of railway cars, and in the wear of the contact shoes with the third rail of electric railway systems of the third-rail type. It has been found in practice that the fine metal dust created in these ways is objectionable, especially in underground or conduit railways, by reason of the danger and injury resulting from inhaling an atmosphere impregnated therewith, as well as fouling the shoes and rails and deteriorating the character of the contact, especially between the contact shoe and the third rail. Still another objection resides in the quite considerable loss of metal represented by the wear of these parts, which metal, if it could be saved and re-melted and re-used, would represent a considerable saving in the cost of material.

The object of my invention is to provide a simple means for obviating these objections and disadvantages, and this object is accomplished through the provision of means for collecting the dust thus generated from the vicinity of the shoe and retaining or confining the same until the end of the run, or other point of disposal, is reached; and an especial feature of the invention resides in the provision of means whereby the dust collected is retained until disposed of, irrespective of whether the dust-collecting agent is active or passive.

The means which I prefer to employ for drawing or collecting the dust are of a magnetic character; this feature of the invention residing substantially in the location of a magnet in the vicinity of the point or place of generation of the dust for the attraction and collection of the latter; and the means for retaining the dust thus collected consisting preferably of a receptacle of suitable form to hold and contain the dust whenever

the magnet is deenergized, allowing the dust to fall therefrom. The magnet may be permanent or electric, and may take many forms within the purview of the invention, different forms being employed according to the form and relative location of the shoe being served thereby; and the dust-retaining agent may likewise take any suitable form that is consistent with its character as a holding or retaining device for the dust when freed from the magnet.

In the accompanying drawings I have illustrated applications of the principle of my invention to the case of third-rail contact shoes and car wheel brake shoes; but it will be understood that the invention is capable of useful application in many other relations too numerous to be herein specified.

Referring to the drawings,—Figure 1 is a side elevational view, partly in section, of a portion of a railway car truck showing my invention applied thereto; Fig. 2 is a similar view of a third-rail contact shoe equipped with my invention; and Fig. 3 is a top plan view of the shoe and its attachment shown in Fig. 2.

Referring first to Fig. 1, 10 may represent a side bar of a car truck, 11 the car wheels, and 12 the usual brake shoes. 13 designates an arc-shaped magnet core connected with the head of the brake shoe or the end of the brake beam by a central stem or post 14. Around these stems are located coils 15 which may be in series with the wire 16 forming part of an electric circuit. When the electric current is on through the coils 15, the ends of the arc-shaped cores 13 represent one polarity and the shoe 12 represents the opposite polarity of the magnet; and metallic dust generated and given off between the brake shoe and the wheel will be collected on both the magnet and the shoe. Suitably secured to the brake beam or any other supporting device and surrounding and enveloping each of the magnets 13, as well as underlying the shoe 12, is a substantially cup-shaped dust-retaining casing or receptacle designated by 17, which receptacle should be of non-magnetic material, such as brass. The feature of importance about this receptacle is that it be so formed and placed as to catch and retain particles of dust liberated by the magnet and shoe when the latter are deenergized.

In Figs. 2 and 3, 18 may represent the 110

third rail conductor of an electric railway of the third-rail type, and 19 the contact shoe or trolley suspended by links 20 from a side bar 21 of the truck, and sliding over the rail 18 in a manner well understood. Mounted on the shoe 19 by means of a central post 22 is a bar or magnet core 23 preferably having inwardly and downwardly turned pole-pieces 24 at its ends opposite the ends of the shoe. Surrounding the bar or core 23 is a coil of wire 25 representing an electric conductor, whereby the magnet is energized upon the sending of an electric current through the coil. Attached to the upper side of the shoe, as by means of screws or bolts 26, near the ends of the shoe, are dust-retainers in the form of casings or housings 27 that envelop the polar projections of the magnet and are so formed and located as to be well adapted to catch and hold the particles of metal dust collected by the magnet when released therefrom by the deenergizing of the magnet.

In the form of the invention shown in Fig. 1, the wires 16 may form part of a continuous closed local circuit; or they may be so connected with the trolley pole or other main conductor leading to the car motor through the controller that the circuit will be closed therethrough when the circuit through the motor is opened, or they may be so connected that the circuit will be closed therethrough by the brake-applying mechanism. In the latter cases, the circuit through the wires 16 will be broken or interrupted when the controller is operated to supply current to the motor or when the brake mechanism is released, and this would deenergize the magnets, which operation would allow the dust collected by the magnets to drop into the retainers where it would be held against loss and dissipation until the end of the run or other point of disposal. Similarly, in the form of the invention shown in Figs. 2 and 3, the wires 25 may be in a continuously closed circuit, or they may be so connected as to open the circuit when the supply of current to the motor is cut off by the controller; in which latter case the dust collected on the pole-pieces would be liberated and dropped into the retaining devices 27 and there held until the end of the run or other point of disposal.

In an application filed by me on the 17th day of March, 1906, Serial No. 306,672, I have disclosed and claimed that the generic part or feature of the present invention consisting in the employment of magnets in association with contact shoes for collecting the metal dust and holding the same so long as the magnet is energized. My present improvement is distinguished therefrom by the addition of means for retaining the dust thus

collected, irrespective of whether the collecting means be active or inactive. That is to say, the dust will be retained and held against dissipation even though the magnets be deenergized after a quantity of dust has been collected thereon. This latter feature is of importance, both as a means for saving for re-use the dust collected, and as a means for preventing subsequent dissipation of the dust collected by the magnets.

It will be understood that the forms and relative locations of both the magnets and the retaining devices may be considerably altered and varied from those shown in the drawings without departing from the spirit of the invention, or sacrificing any of the advantages thereof. It is also noted that, while I have shown and described magnetic means for collecting the dust, yet other means might be substituted therefor within the spirit and purview of the invention.

I claim:

1. The combination with two or more abrasive surfaces generating dust, of means for attracting and arresting said dust, and means for receiving and retaining the dust subsequently released by said attracting and arresting means.
2. The combination with two or more abrasive surfaces generating metallic dust, of a magnet serving to attract and arrest said dust, and means for receiving and retaining the dust subsequently released by said magnet.
3. The combination with two or more abrasive surfaces generating metallic dust, of a magnet located in the vicinity of said surfaces and operating to attract and arrest said dust, and a receptacle so located relatively to said magnet as to catch and retain the dust released by the deenergizing of the latter.
4. The combination with a contact-shoe, and a metallic surface frictionally engaged thereby, of means located in the vicinity of said shoe for attracting and arresting the metallic dust generated by said parts, and means for retaining the dust subsequently released by said attracting and arresting means.
5. The combination with a contact-shoe, and a metallic surface frictionally engaged thereby, of magnetic means located in the vicinity of said shoe serving to attract and arrest the metallic dust generated by said parts, and a receptacle for retaining the dust subsequently released by the deenergizing of said magnetic means.

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