(No Model.) 2 Sheets—Sheet 1.

H. FLAD.

RAILWAY AIR BRAKE.

No. 307,535. Patented Nov. 4, 1884.

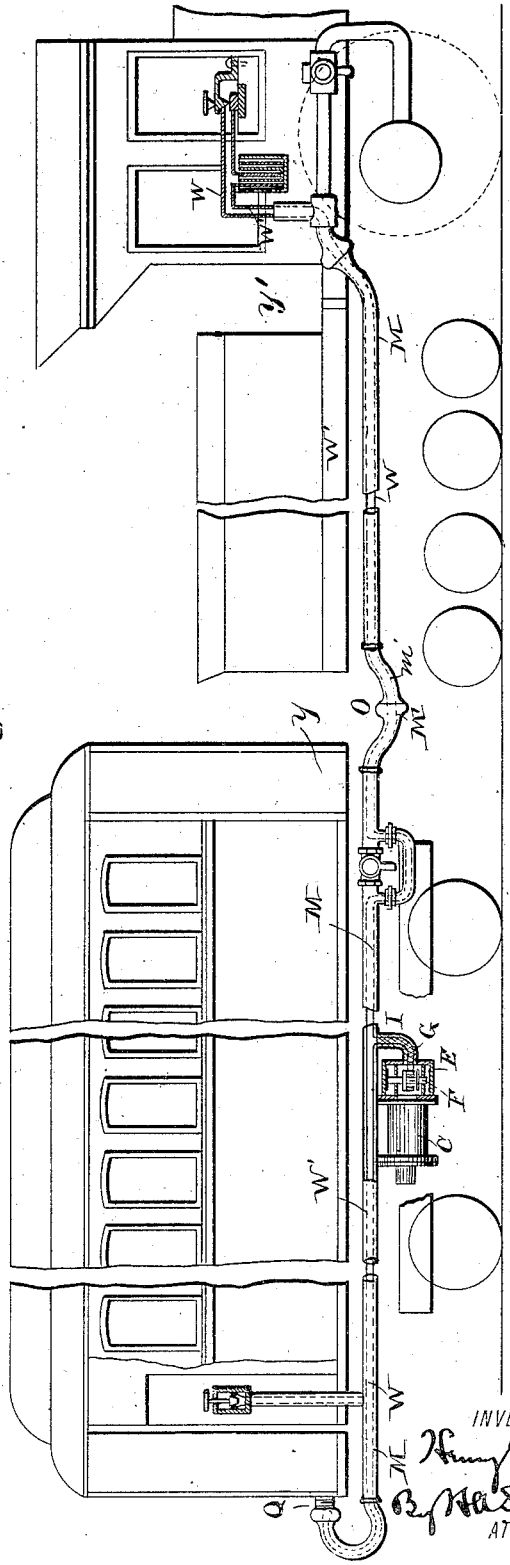


Fig. 1.

WITNESSES

Wm. T. Gill

Geo. F. Downing

INVENTOR

Henry Flad,

By Wm. Seymour

ATTORNEY

(No Model.) 2 Sheets—Sheet 2.

H. FLAD.

RAILWAY AIR BRAKE.

No. 307,535. Patented Nov. 4, 1884.

FIG. 3.

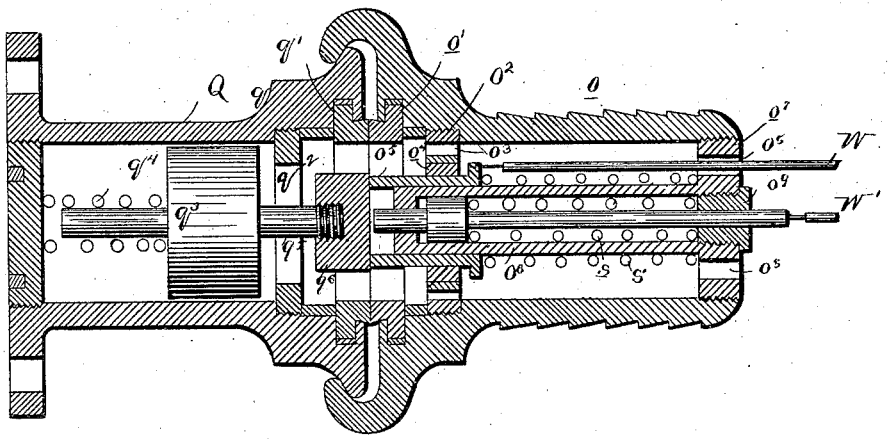
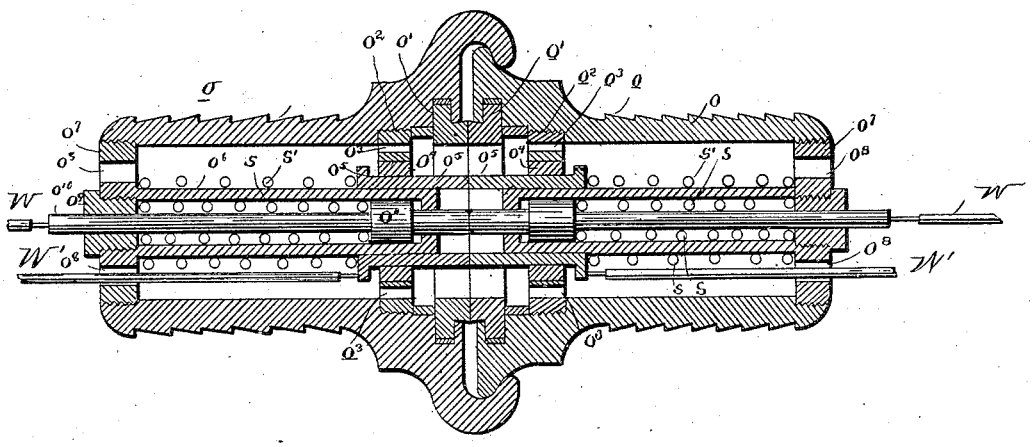


FIG. 2.



WITNESSES

Chas. F. Gill

Geo. F. Downing

INVENTOR

Henry Flad.

By H. A. Seymour

ATTORNEY

UNITED STATES PATENT OFFICE.

HENRY FLAD, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE ELECTRO MAGNETIC BRAKE COMPANY, OF EAST ST. LOUIS, ILLINOIS.

RAILWAY AIR-BRAKE.

SPECIFICATION forming part of Letters Patent, No. 307,535, dated November 4, 1884.

Application filed May 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, HENRY FLAD, of St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Railway Air-Brakes; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved electric circuit and connections for controlling the valves of electro-magnetic railway air-brakes.

In Letters Patent No. 296,546, granted to me April 8, 1884, for improvement in electro-magnetic air-brakes, I have shown an electric circuit composed partly of an insulated wire arranged in the main pipe and partly of the wheels of the cars and portions of the railway-rails upon which they run. It might be considered objectionable under some circumstances to use the wheels and rails as a portion of the electric circuit—as, for instance, on account of the necessity of keeping the rails electrically connected end to end in a line of track, and, further, because of the necessity of arranging upon the cars and the engine certain intermediate conductors necessary to complete what may be called the "return-circuit," or that portion of the circuit which is outside of the air-pipes. I have therefore, in my present invention, provided a complete metallic circuit comprised within the main air-pipe, its connections, and couplings.

I have on the 9th day of April, 1884, filed an application for patent for improvement in electro-magnetic air-brakes, and in the following description and accompanying drawings I will describe and show my present improvements in a general way in connection with the invention set forth in my said previously-filed application.

In the drawings, Figure 1 is a diagram representing in side elevation portions of a car and an engine coupled in a train provided with an air-brake system comprising my improvements. Some of the parts of the cars and truck-frames are omitted in order to permit observation of the brake-pipes and other apparatus. Fig. 2 is a longitudinal section through the coupling of the hose which connect the air-pipes from car to car. Fig. 3 is a similar section of the blind coupling and a hose-coupling connected therewith.

Referring to Fig. 1, Y is the car, and Y′ the engine. M is the main air-pipe; M′, the hose attached to the opposite ends of the air-pipe on each car. O is the hose coupling, and Q designates the blind couplings at the ends of the cars. Under one of the cars is shown the brake-cylinder C, having an attached valve-chamber, E, in which is a tubular valve, F, controlled by an electro-magnet, G, as in my application filed April 9, 1884, and to which I refer for a full description of the operation of the valve and other parts of the brake apparatus, as my present invention relates only to the improved circuit, in which is included the magnet which operates the valve. A small branch pipe, I, leads from the main pipe M to the central compartment of the valve-chamber E, for a purpose which will presently appear. Through the main pipe are arranged two insulated electrical conducting-wires, W and W′, the former of which may be called the "direct" and the latter the "return" circuit wire. The wire W is led in a loop through the small pipe I to the valve-chamber, and within the same is connected to include the coils of the electro-magnet G. The other wire, W′, extends through the main pipe and its hose from coupling to coupling without interruption. The small pipe I is filled with paraffine, or some other sealing substance, in order that the air may not escape through this pipe from the main pipe.

The hose-coupling is composed of the two metallic parts, *o o*, (see Fig. 2,) provided with clutches for engaging each other in the usual manner, and each part of the coupling has set in its mouth an elastic gasket, *o′*, so that when the two parts of the coupling are engaged these gaskets will come together and form an air-tight joint. Just behind the gasket in each part of the coupling is screwed a metallic disk, o^2, having air passages or perforations o^3 arranged about its center, at which is formed a larger aperture lined by a non-conducting ring, o^4, within which fits to slide freely a

short metallic tube or thimble, o^5. Within this tube or thimble is arranged the front end of a tube, o^6, of ebonite or other non-conducting material, the rear end of which is firmly attached to a disk, o^7, of similar material, screwed into the end of the coupling part, and having perforations o^8 about its center. The rear end of the ebonite tube o^6 is closed by a screw-plug, o^9, perforated through its center to form a bearing for a metallic rod, o^{10}, which has also a bearing in and projects outwardly beyond the front end of said ebonite tube. Within said tube the rod is provided with a shoulder, o^{11}, against which bears one end of a spiral spring, s, which surrounds the rod and has its other end bearing against the plug o^9, so that said spring will press the rod outwardly, its outward movement being limited by the striking of the shoulder o^{11} against an inwardly-projecting flange at the front end of the tube o^6. Around this tube o^6 is coiled a spring, s', one end of which bears against the flanged inner end of the short metallic tube or thimble o^5, while the other end of said spring rests against the disk o^7. This spring forces the metallic tube or thimble o^5 outwardly, or in the same direction in which the spring s forces the metallic rod o^{10}. Normally the thimble o^5 and rod o^{10} will project slightly beyond the mouth of the coupling part; but when the two parts of the coupling are engaged, as shown in Fig. 2, their thimbles o^5 will butt against each other, as will also their rods o^{10}, and they will be forced inwardly somewhat against the tension of their springs, which will hold them in good electrical connection. At each hose-coupling the wire W coming from the main pipe into the base passes through one of the perforations o^8 of the disk o^7, and is electrically connected to the short metallic tube or thimble o^5, while the wire W′ does not enter the hose-coupling, but is connected to the rearwardly-projecting end of the metallic rod o^{10}. It will now be seen that at each coupling the thimbles form the continuous electrical connection of one wire from car to car and the rods o^{10} form the coupling-connections of the other wire, so that the circuit of both wires will be completed at the coupling when the two parts thereof are engaged.

On each end of each car is arranged a blind coupling, Q, with which a hose-coupling is to be engaged at the end of a train, as shown in Fig. 1 and in the sectional figure, 3. This blind coupling has a tubular metallic part, q, provided with clutching devices for engaging a hose-coupling, the same as one hose-coupling engages another, and in the mouth of the blind coupling is set an elastic gasket, q', which forms an air-tight joint with the gasket, o', of the hose-coupling. Behind the gasket in the blind coupling is screwed a ring, q^2, which serves as a limit to the outward movement of a piston, q^3, pressed outwardly by a spring, q^4, and having fixed through its center a piston-rod, q^5, carrying at its outer end a metallic head, q^6, which is arranged to come in contact with both the thimble o^5 and rod o^{10} of an engaged hose-coupling, as shown in Fig. 3. It will now be seen that when the hose-coupling at the rear end of a car is connected with the blind coupling on the rear end of the same car, the wires W and W′, which are arranged through the air-pipe and hose, will be electrically connected through the thimble o^5, metallic head q^6, and metallic rod o^{10}, and the metallic circuit will thus be completed at the rear end of the train. At the front end of the train the hose-coupling at the front end of the front car may be connected to a suitable coupling on the engine or tender, and proper connections made in any suitable manner from the wires W and W′ to the opposite poles of a generator arranged for operation on the engine.

I do not confine myself to any particular manner of connecting the two conducting-wires with the generator on the engine.

What I claim is—

1. In an electro-magnetic car-brake system, a complete metallic electric circuit arranged through the main air-pipe and connections, and including electro-magnets arranged to operate the valves, substantially as described.

2. The combination, with the main pipe, hose and hose-couplings, and the insulated electrical conducting-wires arranged in said pipe and hose, of a spring-actuated ring forming the terminal of one wire, and a spring-actuated rod forming the terminal of the other wire, the said spring and rod being located within the coupling and insulated from each other, substantially as set forth.

3. The combined hose and wire coupling composed of the hose-coupling part o and the suitably supported and insulated spring-pressed thimble and rod arranged within said coupling part, and adapted for connection with the separate conducting-wires, substantially as described.

4. The combination, with the blind coupling arranged upon a car and inclosing the spring-pressed metallic head q^6, of the hose-coupling inclosing the suitably supported and insulated spring-pressed thimble and rod connected to separate conducting-wires, and adapted to come in contact with said spring-pressed metallic head when the hose-coupling is engaged with the blind coupling, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HENRY FLAD.

Witnesses:
E. F. FINNEY,
J. S. MCLEOD.