(No Model.) 2 Sheets—Sheet 1.

S. K. BUELL.

BRAKE SHOE.

No. 484,404. Patented Oct. 18, 1892.

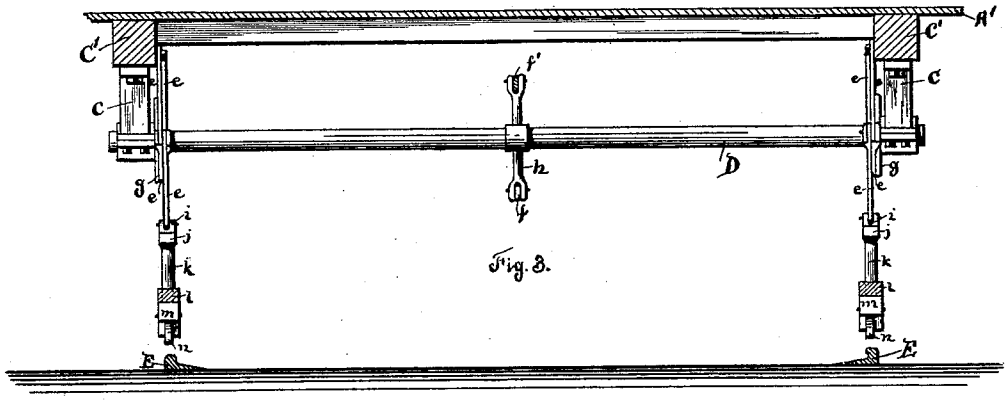

Fig. 3.

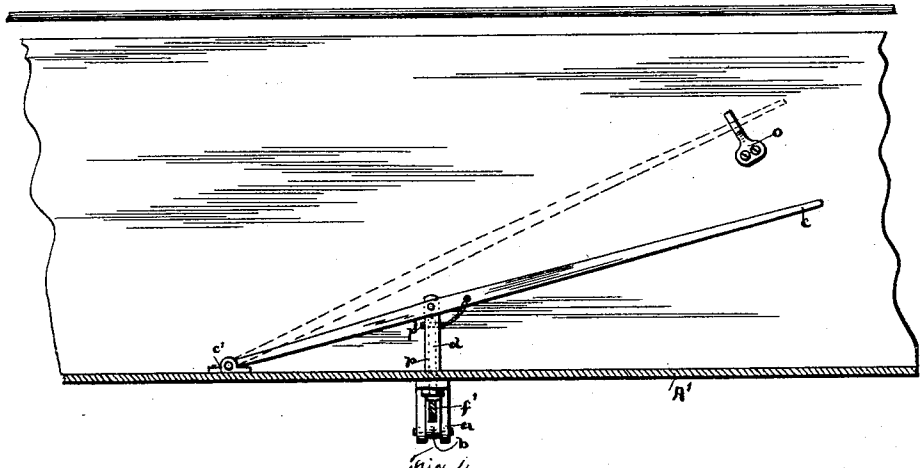

Fig. 4.

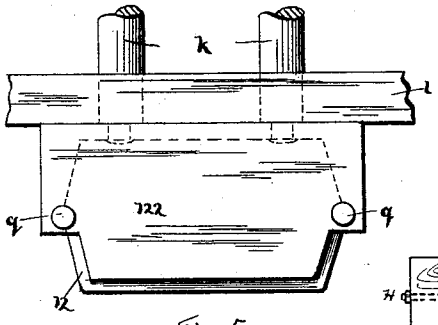

Fig. 5.

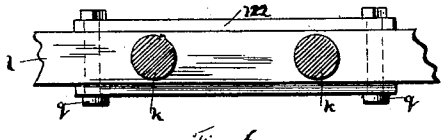

Fig. 6.

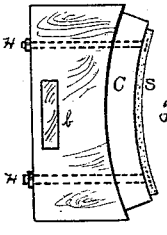

Fig. 1.

Witnesses
F. A. Cutter.
J. L. King

Inventor
Samuel K. Buell

(No Model.) 2 Sheets—Sheet 2.

S. K. BUELL.

BRAKE SHOE.

No. 484,404. Patented Oct. 18, 1892.

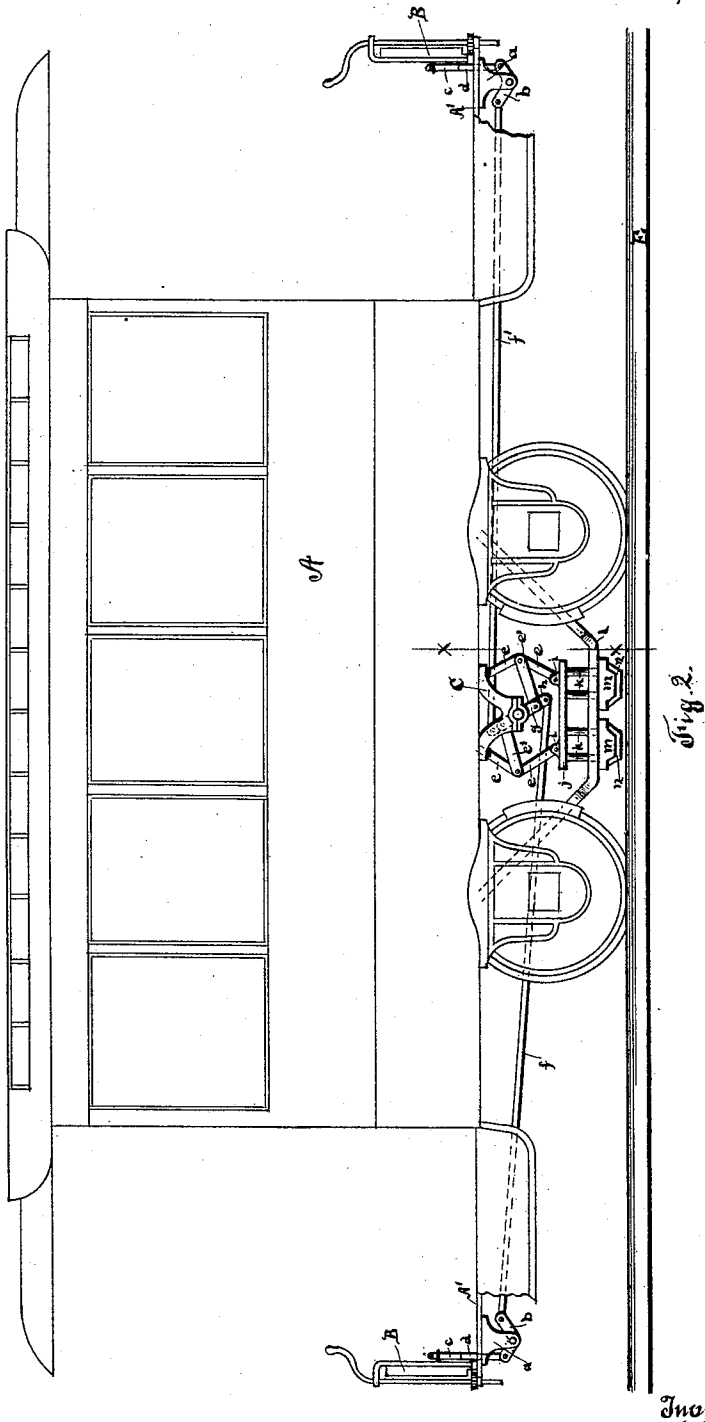

Fig. 2.

Witnesses
F. A. Cutter.
F. L. King

Inventor
Samuel K. Buell

UNITED STATES PATENT OFFICE.

SAMUEL K. BUELL, OF WORCESTER, MASSACHUSETTS.

BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 484,404, dated October 18, 1892.

Application filed April 6, 1891. Serial No. 387,739. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL K. BUELL, of the city and county of Worcester, State of Massachusetts, have invented Improvements in Brake-Shoes, of which the following is a specification.

My invention consists, primarily, in the equipment of a brake with a shoe or friction-surface that comprises a concrete conglomerate block, substantially as hereinafter described.

In all of those forms of brake-shoes that have been employed heretofore which have made use of blocks a single elementary material has been used. When a concrete conglomerate is used, the material is placed in a new combination in its adaptation as a brake-shoe and its old function is largely expanded.

In the construction of a brake-shoe great advantages arise in the use of broken fragments or granular particles of quartz, emery, corundum, or similar hard-cutting materials, as consolidated in a bond of cement, over the other means of confining said material in the detachable manner as proposed and disclosed in other attempts. In a properly-constructed conglomerate the bonded particles or fragments are held in a rigid self-supporting juxtaposition by means of the strengthening medium of cement, a method of fastening best calculated to withstand unequal pressure without damage. Furthermore, when the fragmentary material or plastic mass of same is compressed into the desired form the grinding fragments, as presented on the face of the shoe, are so arranged in the holding material and leveled off as to leave no projecting particles or irregularities to rasp groove-like cuts when applied in its bearing against the periphery of a wheel. These minute grinding-cutters need, therefore, no adjustment in the sense of fitting, as in the devices heretofore used, and therefore are not liable to become out of uniform adjustment with each other, as might be the case in blocks or panels that are simply mechanically confined. The method of disposition of panel-blocks, for instance, as well as the method of fastening same, restricts their use to but one grade of brake-shoe, while the method of embedding hard granular substances in cement-like holding material admits of making a variety of grades, from a coarse, rigid, heavy shoe, strengthened by a hard cement, to a fine elastic gum-bonded shoe, whose particles are easily abraded.

My invention further consists in certain combinations and sub-combinations, to be hereinafter described.

Figure 1 shows my invention applied to an ordinary brake-head. Fig. 2 shows my invention applied to a track-brake, and Fig. 3 is a view of a brake mechanism for applying power to produce friction to both the wheel and track which embodies my invention. Fig. 4 shows a front view of that portion of the ends of a street-car having a dash-board and the devices for brake mechanism which are located in connection therewith. Fig. 5 shows, on an enlarged scale, details of track brake-shoes; and Fig. 6 shows an inverted plan view of the same.

Referring to Fig. 1, H is a brake-head, of wood or metal, in end view with its connected brake-beam *b*. C is a metallic box-like clamp in which is placed a shoe S, that is composed of a conglomerate of corundum and a cement or compound for holding the said corundum in a brick-like mass, and the brick thus formed is shown bolted through the clamp C to the head-block H. When a friction-surface of the character of the shoe S is pressed against a revolving wheel, it adheres thereto and checks the motion of the wheel better than a surface of iron or any other known substance would do, the pressure being the same in both instances. By the use of the conglomerate a degree of uniformity is reached in manufacture that is impossible when natural stone is employed—that is, every brake-shoe can be made exactly like every other brake-shoe—but when blocks of stone of natural formation are used it is possible to cull out those that are best. This cannot be done when brake-shoes are made of a conglomerate, as all are alike. Moreover, the use of conglomerate admits of making a variety of grades, each of which can be reproduced with unerring uniformity and made hard or soft, as conditions of use require. Further advantages resulting from the use of the conglomerate bricks consist in diminishing the expense and amount of labor required for shaping and fitting for use and the

furnishing of different grades to be used for heavy or light work.

Instead of employing corundum, I may employ or use a conglomerate of sand and any substance that is gritty and a holding-cement.

Referring to Fig. 2, there is shown a street-car A of ordinary construction provided with a track-brake, in which friction surfaces or shoes *n n*, made in accordance with my invention, are employed. Supported to the bottom of the car by means of a hanger C are the parts *e e e e*, *e' e'*, and *g*, forming toggle-joint mechanism, by means of which the brakes are forced to the track with greater power. From beneath the platforms B B at either end of the car run horizontal operating-rods *f' f'*, said rods connecting the knuckle-joint mechanism with the operating-brake lever *c* by means of the intermediate parts L, levers *b b*, and attached vertical rods *d d*. In this track use the form of the conglomerate block is of practical consequence, and I make the blocks for this use rectangular oblong or equivalent and their edge beveled to allow them to run up onto and pass over a small obstruction or inequality in the track. The greatest usefulness of the concrete conglomerate in its application as a friction-surface in a brake-shoe is in its adaptation to the track as a safety or emergency brake.

A wheel-brake is all proper and often sufficient so long as the wheels adhere to the track and withstand a continued increase of pressure; but when the adhesion to the track ceases and sliding commences something more is then needed to effectally hold in check the car. This can be accomplished in a more perfect and reliable manner by the use of a friction-surface of the character named than can be found by substituting any other known material. In fact, no amount of friction equal to such a device has yet been found for all conditions of track, wet or dry. A properly-constructed conglomerate is capable of producing greater friction and at the same time possessing sufficient strength and endurance under all conditions to withstand enormous pressure than would be found in this special application by using natural stone in its unmixed condition. There is in most natural formations a vital deficiency of cohesion, due to the various seams and hard and soft spots found therein, and when subjected to great stress—as in an emergency or when required to override inequalities in track—would naturally crumble and become easily pulverized under the unequal strains to which it is subjected. The heat of friction and the contrary effects of a freezing temperature have no deteriorating effect upon the concrete conglomerate, while these varying extremes in temperature produce a fatal defect in the usefulness of a natural stone.

Referring to Fig. 3, there is shown a section of the car taken back of brake on line *x x*, and shows a view of brake mechanism for applying friction to both the wheel and track.

Referring to Fig. 4, there is shown on the side of dash-board facing the platform of car the brake-lever *c*, fulcrumed in a standard *c'* at the point of juncture where platform and dash-board join and near to one side of platform, as shown. Near to the opposite side of the platform on the dash-board is a rack *o*, designed for the retention of brake-lever *c* when the latter is not in use and it is desired to hold the brake-shoes *m m* out of engagement with the rail. When it is desired to operate the said brake mechanism from the car-platform, the lever *c* is pressed downward, forcing vertical rod *d*, attached thereto, to actuate the central lever or cam *b*, to which rods *f' f'* are fastened. Vertical rod *d* is provided with pin-holes and is vertically adjustable, as shown in dotted lines, and the rod can be raised and the pin *p* be introduced when it is necessary to prevent the up-and-down motion of said rod from causing any harm.

Referring to Fig. 5, *m* is a box holding the composition brake-shoe *n*, which is made fast to said box by bolts *g g* and so shaped as to allow of its being reversed when one face is worn away. Socketed into top of said box *m* and running piston-like through the frame *l* are plunger rods or posts *k k*, which are attached to the toggle-joint, and by means of which the brake is forced onto the track.

Referring to Fig. 6, there is shown a top view of the same, Fig. 5, and like letters refer to like parts, as shown and described in Fig. 5.

What I claim is—

1. A brake-shoe consisting of a single block of concrete conglomerate composed of granulated corundum and a binder or cement, substantially as described.

2. A brake-shoe having its entire contact-face formed of a concrete conglomerate composed of granulated corundum and a suitable binding agent, substantially as described.

Worcester, January 30, 1890.

SAMUEL K. BUELL.

Witnesses:

FRED A. OLMSTEAD,

FRANK H. TENNEY.