W. C. FULLER.

Car Spring.

No. 4,827. Patented Oct. 24, 1846.

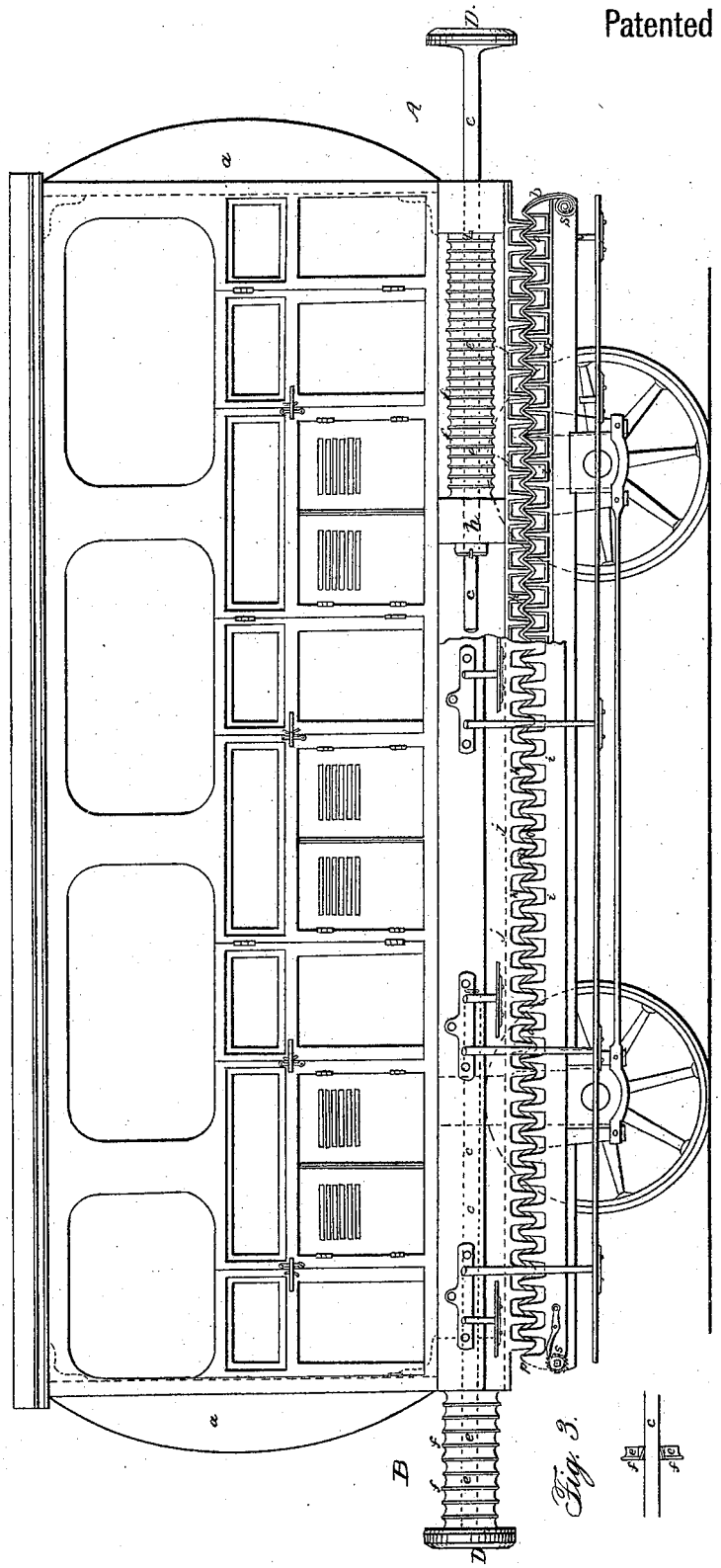

Fig. 1.

Fig. 3.

Fig. 2.

UNITED STATES PATENT OFFICE.

WM. C. FULLER, OF HOLBORN, ENGLAND.

RAILROAD-CAR.

Specification of Letters Patent No. 4,827, dated October 24, 1846.

To all whom it may concern:

Be it known that I, WILLIAM COLES FULLER, a subject of the Queen of Great Britain, and now residing at Brownlow street, in the parish of St. Andrew, Holborn, and county of Middlesex, in the said Kingdom, cabinet maker, have invented or discovered a new and useful invention of Improvements in the Construction of Carriages for Railways; and I do hereby declare that the following is a full and exact description thereof.

My improvements consist firstly in placing a cushion at each end of a railway carriage and covering the whole or the greater part of each end of it in such a manner that in case of a collision of a train the cushions of the carriages may diminish the effect of the concussion and tend to the security of the passengers.

The second part of my improvements consists in the application of buffer springs of vulcanized india rubber or caoutchouc; and the third in the forming of the springs that support the body of india rubber, in manner hereinafter described for the purpose of promoting the ease and safety of the passengers and the safety of the transit of goods.

The first part of my invention (viz the large cushions) may be either used alone or in conjunction with the second or third parts; and in like manner the second or third parts may be adopted and used without the first.

Figure 1 represents a railway carriage having a cushion *a a* at each end of the carriage firmly attached thereto. The end and top framing are made of extra strength to resist the pressure upon these cushions which it should be observed are only designed to come into contact under circumstances of collision or extraordinary pressure when the resistance of the lower buffers have been overcome. The cushions are covered with leather, strong canvas, india rubber, or other suitable material, and are stuffed with wool, india rubber, air-bags, horse-hair, or any other elastic or suitable material, which will most effectually protect the passengers.

The application of my india rubber springs to railway carriage buffers is shown in two different ways in the before mentioned Fig. 1. At one end of the carriage in Fig. 1 my improved buffer spring is represented as being placed under the carriage and within the framing whereas at the opposite end it is shown as situated between the buffer head and end framing.

In place of the ordinary buffer springs I employ circular disks or rings of india rubber *e e* of about five inches to ten inches in diameter and from half an inch to three inches in thickness according to circumstances and the situation of the spring. These disks or rings are placed upon the circular rods or shafts *c c* of the buffers with a thin disk or circular plate of tinned iron galvanized iron or other similar material *f f* placed between them as a support so that every ring of india rubber *e e* will be situated between two iron or other disks *f f*. These india rubber springs may as before mentioned be placed either inside the framings as shown at the right hand end of the figure and covered with boxes or covers or they may be placed between the buffer heads D, and the end framings of the carriages as shown at the left hand or opposite end of the carriage. When the india rubbers *e e* are placed under the carriage as shown at A (which is perhaps the more preferable mode of the two) they should be made of less diameter than when placed outside and a stop *g* is made on or attached to the sliding rod of the buffer, which when the buffer of one carriage comes into contact with or strikes against the buffer of an adjoining one it compresses the india rubber rings *e e* laterally against the stationary piece *h* of the framing.

It will be seen that the thin iron disks *f f* are of greater diameter than the india rubber disks *e e* and as these latter are compressed laterally, their diameter is increased in proportion so that when in a compressed state they completely fill up the space between the iron disks. It should be understood that as the sliding rods *c c* pass freely through holes made in the center of the india rubber disks *e e* and metal disks *f f* the india rubber after being compressed laterally thereon as above mentioned is left perfectly free to expand to its original thickness which it will do immediately the pressure is removed, and in order to assist this regular compression and expansion of the india rubber disks and prevent them from binding around the sliding rods which would have the effect of preventing them from expanding regularly and properly the tinned iron disks are placed between the india rubber disks, and the holes in these latter are made of greater diameter than

the diameter of the sliding rods. In order still further to assist in keeping the india rubber disks in their proper places small holes with rough edges or projections are made in the metal disks *f f*, as shown at *n*, *n*, Fig. 2, which by holding onto the india rubber disks will be sufficient to keep them from slipping down out of their places and binding on the rods *c c*. I sometimes also furnish the iron disks *f* with conical collars which by fitting one inside the other will allow the india rubber disks *e e* to be compressed and yet will effectually prevent them from binding on or coming into contact with the rods *c c;* a disk of metal, so furnished, and one of india rubber are shown in Fig. 3, in section. The spring at B is merely a modification of that just described, the india rubber disks being placed between the buffer heads and the end framing instead of inside the framings; this plan may be used in conjunction with the preceding one if thought desirable, or either or both may be employed with ordinary steel buffer springs if required.

The principal advantage of the mode of application shown at B is the facility with which my india rubber spring may be applied to the buffers of railway carriages of the ordinary construction, but as the india rubber disks are more exposed in this plan than in that shown at A they may if thought desirable be protected or covered over with some flexible waterproof material.

It is to be observed that the disks of india rubber employed in the construction of my buffer springs are to be made of a proper diameter according to the part of the carriage in which they are to be placed and so that when the springs are compressed the disks may have sufficient room to expand and the thickness of the disks must be according to the degree of elasticity or rigidity which the spring is intended to possess and it will be found that a spring composed of thin disks will be much more rigid and less elastic than a spring composed of thick disks.

If it is desired that a buffer shall possess greater power or rigidity that object may be attained by applying two or more sets of springs to it.

The application of my india rubber springs for supporting the bodies of railway carriages is also shown at Fig. 1.

i i is an oblong box firmly secured to a framing resting on the axle boxes and furnished with a rack consisting of a number of strong horizontal teeth *o o* projecting upward and extending across the box from side to side and *j j* is a second box and rack attached to the suspended body of the carriage and furnished on its under side with a number of teeth *k k k* projecting downward, and at each end of the framing *j j* guide rods may be made to pass through holes or sockets made in the lower framing for the purpose of keeping the carriage body in its proper position. A long thick rib or strap *p* of india rubber is laid along the top of the horizontal teeth *o o* of the rack in the lower box and both ends of this rib or strap of india rubber are firmly secured. It will now be seen that when the teeth *k k* of the framing *j j* are brought down onto the india rubber rib or strap *p* they will force this latter down between the teeth *o o* and these teeth being arranged at proper and suitable distances and so as to pass up and down between each other the india rubber will prevent the teeth *k k* from descending too far and by its elasticity form a spring for suspending the body of the carriage.

In the place of using teeth as above described either the upper or lower box may be constructed with bars or pins for the purpose of resting upon or supporting the india rubber. The strength or rigidity of the spring will depend upon the closeness of the teeth *o o* to each other and the thickness of the rib or strap of india rubber, and the tension of the india rubber strap is to be regulated by a ratchet *s* so that when the carriage is fully laden there will be sufficient space left for the action of the spring.

Having now described my invention and the manner of carrying the same into effect I would observe that ordinary india rubber is liable to be affected by changes of temperature and to become hard or rigid by exposure to cold, and therefore I prefer to use india rubber or caoutchouc prepared with sulfur in the manner described in the specification of a patent granted in the United States to Charles Goodyear, as caoutchouc thus prepared is not liable to be acted upon by any ordinary temperature to which it may be exposed, and

I hereby declare that I claim as of my invention

1. The application of cushions to the ends of railway carriages as represented at *a*, *a*, and hereinbefore described.

2. I claim the manner set forth of forming the buffers of disks of india rubber with plates of metal interposed between them as herein shown and described, that is to say, the metallic disks being made larger in diameter than those of india rubber, for the purpose set forth.

3. I claim the manner set forth of forming the carriage springs of long straps of india rubber extending along between teeth, *k k*, and *o*, *o*, substantially as described and represented.

W. C. FULLER.

Witnesses:
JOHN VINEY,
FRED WALKDEN.