(No Model.)

E. P. ROCHE.

CHAFE IRON FOR VEHICLES.

No. 279,816. Patented June 19, 1883.

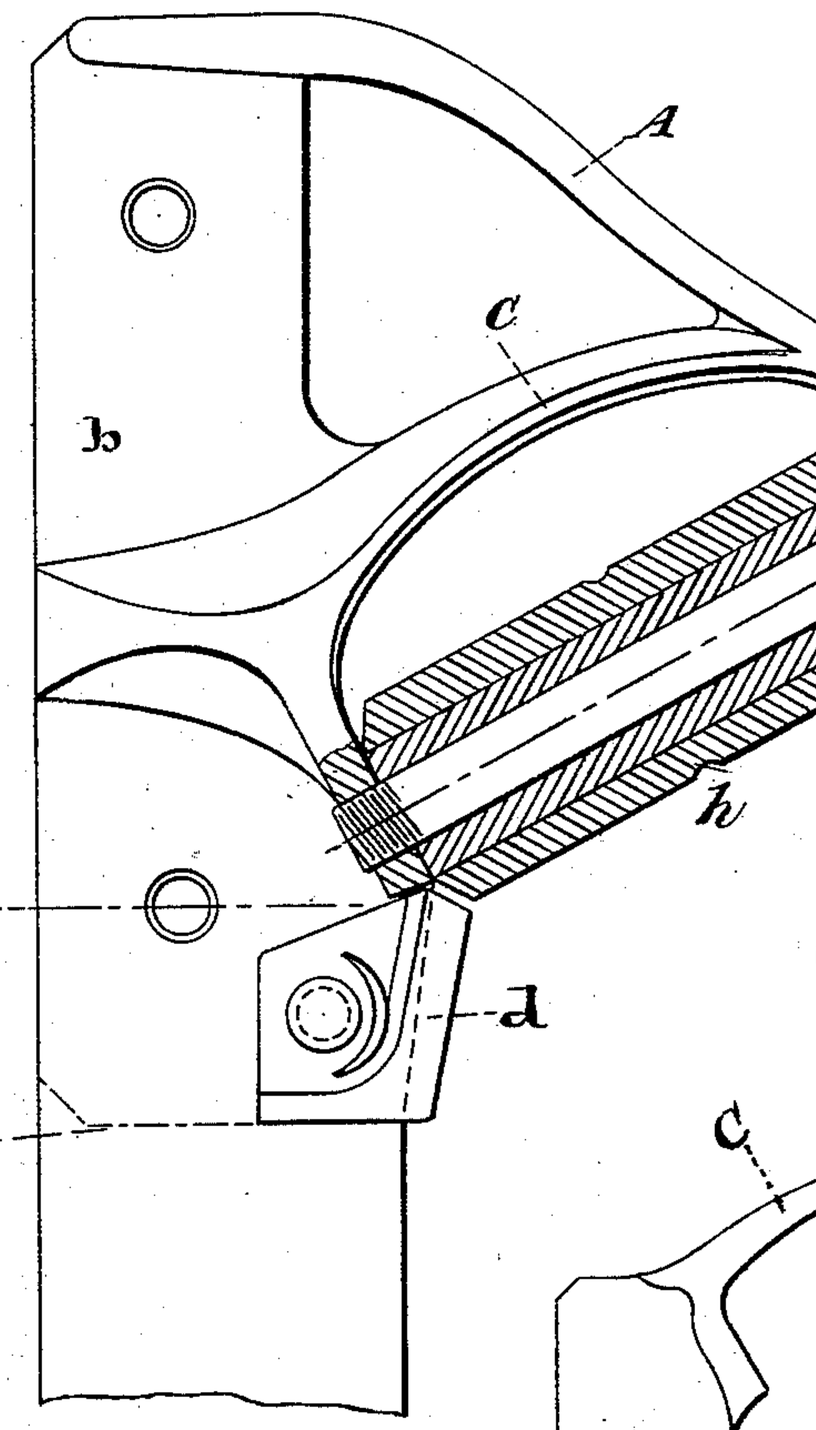


Fig. 1.

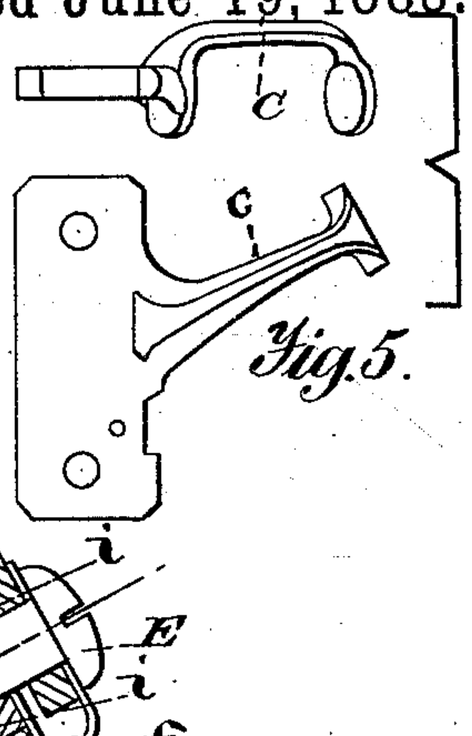


Fig. 5.

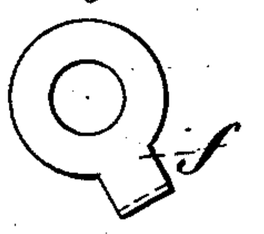


Fig. 7.

Fig. 6.

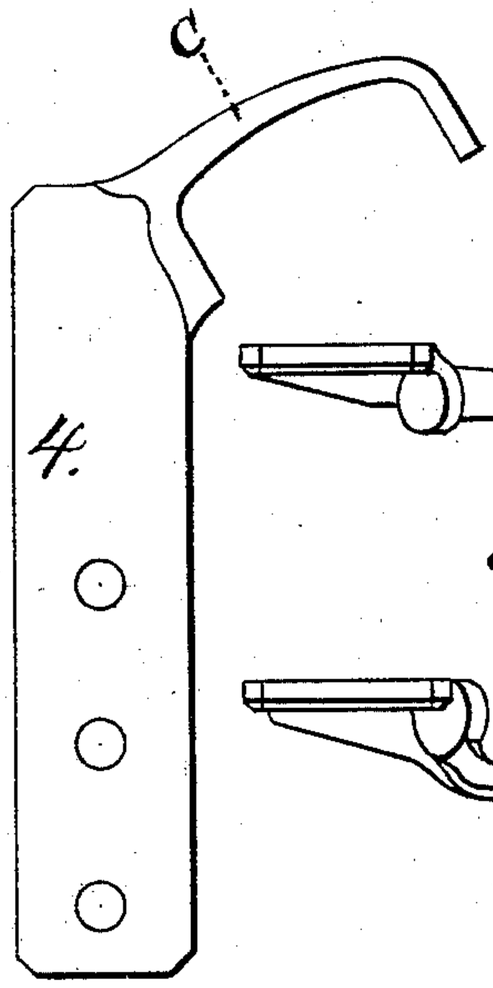


Fig. 4.

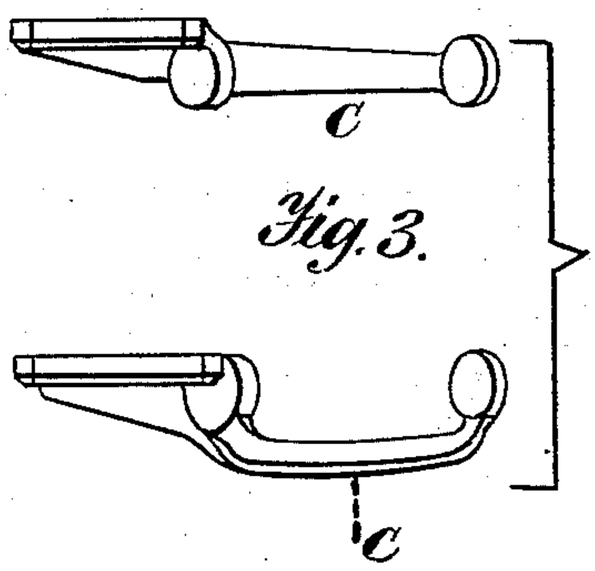
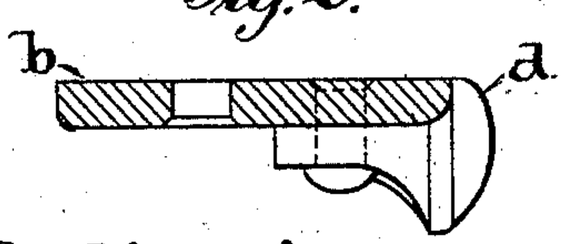


Fig. 3.



Section A.

Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

EDWARD P. ROCHE, OF BATH, MAINE.

CHAFE-IRON FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 279,816, dated June 19, 1883.

Application filed February 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. ROCHE, of Bath, county of Sagadahoc, and State of Maine, have invented a new and useful Improvement in Chafe-Irons for Four-Wheel Vehicles, of which the following is a specification.

My invention relates to and is an improvement on the devices shown and described in my Letters Patent No. 95,381, of September 28, 1869, No. 112,851, of March 21, 1871, No. 127,645, of June 4, 1872, and No. 174,381, of March 7, 1876.

This invention relates to that class of devices which are used as guards on four-wheeled vehicles to prevent the forward-wheel tire, in turning curves, from chafing or cutting into the carriage-body.

My invention has in view the improvement of that class of devices for this purpose in which a roller in a suitable bracket or frame serves as such a guard or body-fender, while at the same time easing the strain on the wheel and permitting the vehicle to be turned in a shorter space with safety. I employ a roll of hard metal, as gray iron or franklinite, which has the important advantage over all material heretofore used in the casting of rolls, that the tire does not wear them into flat surfaces or slab them off into faces, which, once formed, render the whole device useless from the roll sticking or ceasing to revolve when such flat spot on the roll is in contact with the face of the tire. The surface of the roll is made plainly cylindrical, so as to permit the tire to act on it freely. The ends of the roll are chamfered or beveled, thus presenting a smaller and better surface for the rattle-spring to act on, and also allow the supporting ends of the frame to be made smaller and neater in appearance—an important matter in so prominent a part. This shape of the roll end also allows of free escape of dirt by centrifugal force when the roll is in use, and of oiling when needed. It is evident a roll made of such refractory metals as above mentioned must offer serious impediments to boring or drilling out the hole for the bolt or bearing on which the roll is to turn. It is also demonstrated by use that such hard rolls, when bored and put into service, do not retain the lubricating material, but run dry and make a very loud chattering noise. To cast such rolls hollow and then fill them with Babbitt metal only adds a new difficulty, for it is quite impossible to drill through so much soft metal from the chip crowding the drill and rendering the production of rolls in sufficient quantities too expensive. I overcome these difficulties as follows: The roll is cast hollow, the central bore being much longer than the hole required. Into this central bore, or "shell," as the casting is now termed, (the shell being held in position endwise and centrally as to its outside over a steel pin or core by special machinery,) a softer metal is run, when, the steel core being driven out, a straight smooth hole results. It will be seen that by this mode the hole is "trued up" by the outside of the roll, instead of the outside being trued up by the hole. For such lining metal I have found the cheaper forms of Babbitt metal sufficient, and also the better class of type metals.

In the accompanying drawings, Figure 1 is a side view of a roller chafe-iron having a composite frame, and showing the roll, rattle-spring, and screw-bolt, the roll being in section. Fig. 2 is a cross-section at A of Fig. 1. Figs. 3 to 7, inclusive, show modifications and details, as hereinafter explained.

Similar letters indicate similar parts in the accompanying drawings.

A is the back brace dividing and re-enforcing the outstanding arm, C; *b*, the rectangular or body part, the line *m* showing where the frame would be cut off if used on an end-spring vehicle.

d is the "tire-piece," riveted to the frame in front of the inner end of the roll. Fig. 2 shows a section of the tire-piece and frame through line A, on the rectangular part of the frame *b*.

E is the head of a top bolt or screw holding the rattle-spring in place, and screwed into the inner face or bearing of the frame.

f is a section of the rattle-spring. (Shown also in Figs. 6 and 7.) The roll or shell of hard iron is shown by *g*, with beveled ends, the rattle-spring *f*, by its shape, pressing the roll against the inner face of the frame, preventing the vi-

bration of the roll against the face of the frame or on the bolt. An annular score, *h*, is formed in the middle of the roll, to serve as a guide in fitting the chafe-iron to its body, the rule being to set them so that the face of the tire will coincide with the inner half of the roll when the vehicle is unloaded, variations of the tire inward being prevented by the style of spring or tire-piece, and outward by the length of the roll. The composition lining of the roll is shown by *i i*.

From the great diversity in shapes of carriage-bodies, it becomes necessary to vary the shapes of the frames to suit them. Different portions of the country also demand a variation in the frame to suit their conditions as to soil and mud. Thus a side-bar body is best fitted with a frame that protects the side of the body from the mud that is thrown up by the centrifugal force of the roll. Such a modification of the frame is shown in Fig. 5, where the outstanding arm C is shown as being over or above the roll-mortise.

In the Concord or side-spring style of vehicles, used greatly in the country, where mud and frost prove serious obstacles to the action of the roll, the outstanding portion of the frame is modified to meet these conditions by being cast back of the roll. Such a frame is shown in Fig. 4 with the outstanding arm C, while in Fig. 3 the arm C is shown as being back of and beneath the space for the roll, so as to allow no resting-place for mud on the frame and roll, the protection of the bodies of this class of vehicles from the mud thrown by the revolving of the roll being of less account than that the roll should not become clogged or frozen up by the mud adhering to it.

A further modification in the frame is required for the bodies of two-seated or heavy carriages. In these a frame would look too clumsy made as those described for single carriages. Therefore in such frame the metal of the outstanding portion C is divided into the arm C and the brace A, Fig. 1. This shape gives lightness, strength, and also spreads the holes in the body or rectangular portion *b*, Fig. 1, thus obviating the danger of splitting the wood-work of the body by having the screw-holes too near together.

The bodies of end-spring vehicles always afford room for the attachment of the frame in some portion; hence such frames are made short, as in Fig. 5, and to the line *m* in Fig. 1; but the so-called side-spring vehicles are fastened to the running-gear by a yoke or bolts that pass through the center of the spring and side of the body. A frame, to fit such a vehicle, must have iron enough to meet these holes and allow the roll and its supporting portion to project back to the point needed by the wheel when backing onto the roll. Such a frame is shown in Fig. 4. In all these modifications of the frame the roll and its attachments remain the same and for all styles of vehicles.

Side-spring vehicles and all coming under that class are peculiar, in that they are hung by four points to the running-gear. Vehicles of this class do not tip much when loaded on one side, nor rock over when the wheel is crowded onto the chafe-iron in turning; hence the roll can be made quite short, and there is no danger of the edge of the tire cutting into the soft metal of the frame or wood-work of the body when the vehicle is in use turning; and, economy of cost being a vital point in the production of the chafe-irons, no addition is put onto the frames used on that class of vehicles, and these frames, in contradistinction to such as do have the addition, I term the "simple" frame. The other class of vehicles are termed "end springs," and are so attached by the center of the springs or their ends to the running-gear as to permit of great motion sidewise, whether by being loaded on one side or crowded up by the wheel on the chafe-iron. A roll that would overcome the great variations of this class of vehicles would be so long as to destroy by its weight and clumsy appearance the adoption of such a device. To overcome this objection I rivet or cast to the frame a block or piece of hard metal, as gray iron, franklinite, or steel. This piece is attached firmly to the frame in front of and at the inner end of the roll, so that when the body rocks over and the tire of the wheel tends to run in under the edge of the frame and off the inner end of the roll it is met by the hard block and prevented from going farther. The hardness of the block and its rounded convex face, being parallel to the side of the carriage-body, perform all the functions of the best form of chafe-irons in use without the improvement of the roll, at the same time keeping the face of the tire on the roll and allowing it to perform its functions in the best manner. Without some such protection as the hard block to the frame, my device would be of no value to this class of carriages, from the fact the wheel would cramp or catch on the soft iron of the frame and either tip the body of the vehicle dangerously over or strain the wheel in the hub, or "dish" it, in technical language. This addition to the frame I term the "tire-piece." This addition or tire-piece is shown in Fig. 1 marked *d*, and also in Fig. 2. Fig. 5 shows a frame before the tire-piece has been riveted to the frame. These frames are most economically produced by casting them in one piece of malleable iron or in some of the forms by drop-forging.

For purpose of distinction, I designate those frames which do not have or need the tire-piece added to them as "simple" frames and those frames to which the tire-piece is added as "composite" frames.

I claim as my invention—

1. The supporting-frame, cylindrical chafe-iron having chamfered ends, and the axial bolt, combined with the rattle-spring, one part of which encircles the bolt and is clamped between its head and supporting-frame, the other

part encircling the bolt and pressing against the end of the chafe-iron, substantially as set forth.

2. The cylindrical chafe-iron, axial bolt, and supporting-frame, combined with the tire-piece *d*, substantially as set forth.

3. The supporting-frame, with bearings for the axial bolt, and having the back brace, A, rectangular or body part *b*, and outstanding arm C, substantially as set forth.

EDWARD P. ROCHE.

Witnesses:

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ALFRED T. FOGG.