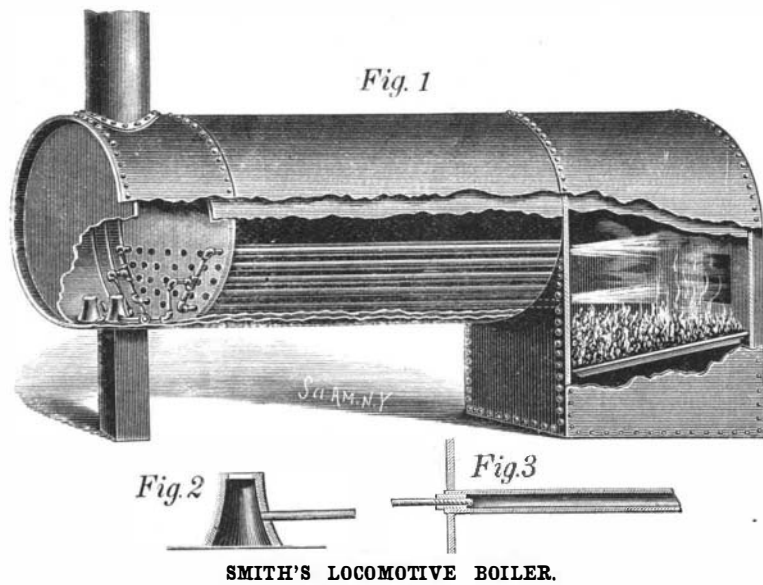


## AN IMPROVED LOCOMOTIVE BOILER.

An attachment for locomotive and other boilers, in which the draught is urged by the exhaust of the engine, and the combustion of the fuel improved, is illustrated herewith, and has been patented by Mr. Charles S. Smith, of Pocatello, Idaho Territory. In a boiler of the ordinary locomotive type, as shown in the illustra-



SMITH'S LOCOMOTIVE BOILER.

tion, a pipe is connected with each of the exhaust nozzles, at points near the bases of the nozzles, as shown in Fig. 2, whereby a portion of the exhaust will be received and conducted to two of the tubes on each side of the boiler. The pipes from the exhaust nozzles are connected with T's, short pipes from which enter the smoke box end of the boiler tubes, to the ends of which they are fitted by bushings, as shown in the sectional view, Fig. 3. The steam thus passed to the fire box from the exhaust becomes heated to the temperature of the water in the boiler, its decomposition in the fire box greatly assisting in obtaining a higher degree of heat, while the force with which it enters causes the sparks and cinders to fall back, preventing them from passing into or through the tubes, and insuring a more complete combustion of the fuel.

## ELASTIC ENGINE FOUNDATIONS AND SUSPENSION OF VEHICLES.

The complete and stable isolation of structures, machines, and vehicles, with a view to deadening shocks, preventing the transmission of vibrations, and diminishing the resulting noise, is a problem which has received a large number of solutions, none of which has hitherto given full and entire satisfaction. The processes employed for the isolation of machines consist in the use of rigid foundations or elastic substances. Masonry foundations, even with the superposition of framework, and surrounded with trenches, have proved insufficient.

The interposition of rubber has given good results in some cases but unsuccessful ones in others, and the causes of which are thus set forth by Mr. G. Anthoni in a recent communication to the Society of Civil Engineers:

"Rubber simply interposed between the floor and the tool to be isolated has been used for a long time, and gives good results, because the isolation is complete, but it can rarely be utilized because there is no stability, and movements may be produced that interfere with or are even dangerous for the service. Besides, in impact tools, the useful effect is diminished.

"If, in order to overcome such inconveniences, we connect the piece to be isolated by bolts, the vibrations pass through the latter, and the isolation is destroyed. Moreover, if we compress the rubber in order to give stability, there is no more elasticity, and if, on the other hand, we do not compress it, but allow it to retain all its elasticity, we do not obtain the stability in view of which the connecting bolt is used.

"Want of success may be due also to the improper use of rubber, for, in order to solve a problem of isolation, we must study the conditions that have to be fulfilled by the blocks from the standpoint of their form, surface, and thickness."

In order to leave rubber its entire elasticity, and to give the isolated system all the stability necessary, Mr. Anthoni has recourse to two methods, which at the same time secure isolation and stability: (1) An increase of the mass of the system to be isolated, and (2) an isolating and elastic attachment.

The first of these is applied to the foundation of machines, while the second is more especially designed for the suspension of vehicles of all kinds.

As an example of an elastic foundation for a collection of machines, we may cite the small central electric works established by Mr. Pulsford in the Faubourg St. Denis. The vibrations of these machines were annoying the neighbors considerably, and lawsuits were imminent, when Mr. Jupont, Mr. Pulsford's electrical engineer, conceived the idea of having recourse to Mr.

Anthoni's method. The accompanying figure shows the application that has been made of it, and which is giving entire satisfaction.

A large oblong ditch was dug, the bottom of which was provided with a floor and a sheet of iron plate over which was distributed a certain number of rubber disks which formed an insulation at once electric and elastic. Upon these disks was laid a second iron plate riveted to a flooring that rendered the plate indistortable. It is upon this flooring that the foundation is built, places being reserved, of course, for the foundation bolts, and spaces being reserved sufficiently capacious to allow of the periodical cleaning of the ditch and for the accumulation of debris between two successive cleanings without interfering with the elastic suspension.

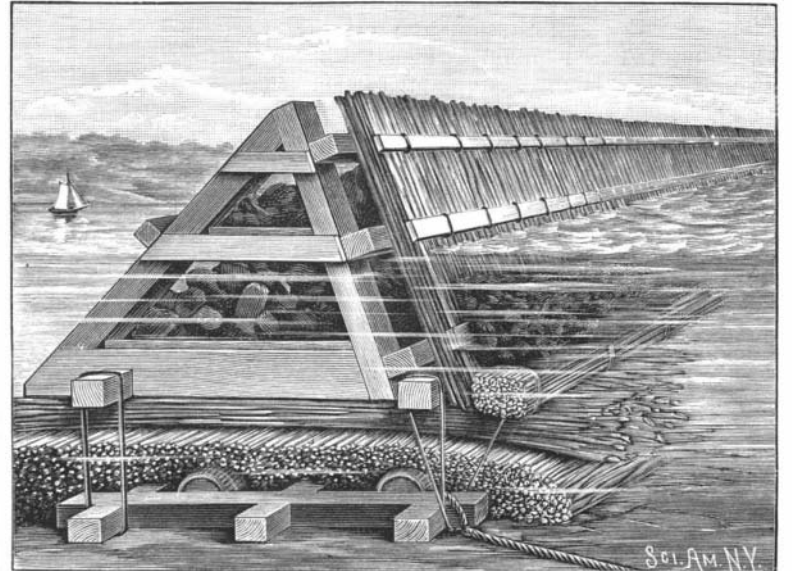
The foundation need not be of masonry, and in some cases it may be advantageous to use a caisson filled

with sand, thus permitting of the easy shifting of the foundation. The trench is covered with a flooring or iron plate permitting of the motions of the masonry in a horizontal direction if it is a question of a steam engine, or in a vertical direction if the elastic suspension is applied to a steam hammer or a pump.

The steam admission and eduction pipes are wound spirally at the upper part, so that they may have elasticity enough to permit of the motion of the whole without forcing the joints.

In the case under consideration, the oscillating motions reach an amplitude of  $\frac{3}{16}$  inch, and nothing is more curious than to see the whole affair, whose weight exceeds 25 tons, displace itself rapidly without the least vibration being felt at the edge of the trench. The same process is applicable to the rails of railways upon metallic viaducts crossing cities, and to the engines of boats, etc.

The second method of isolation, applied to vehicles, consists in the use of a rubber support, which, placed



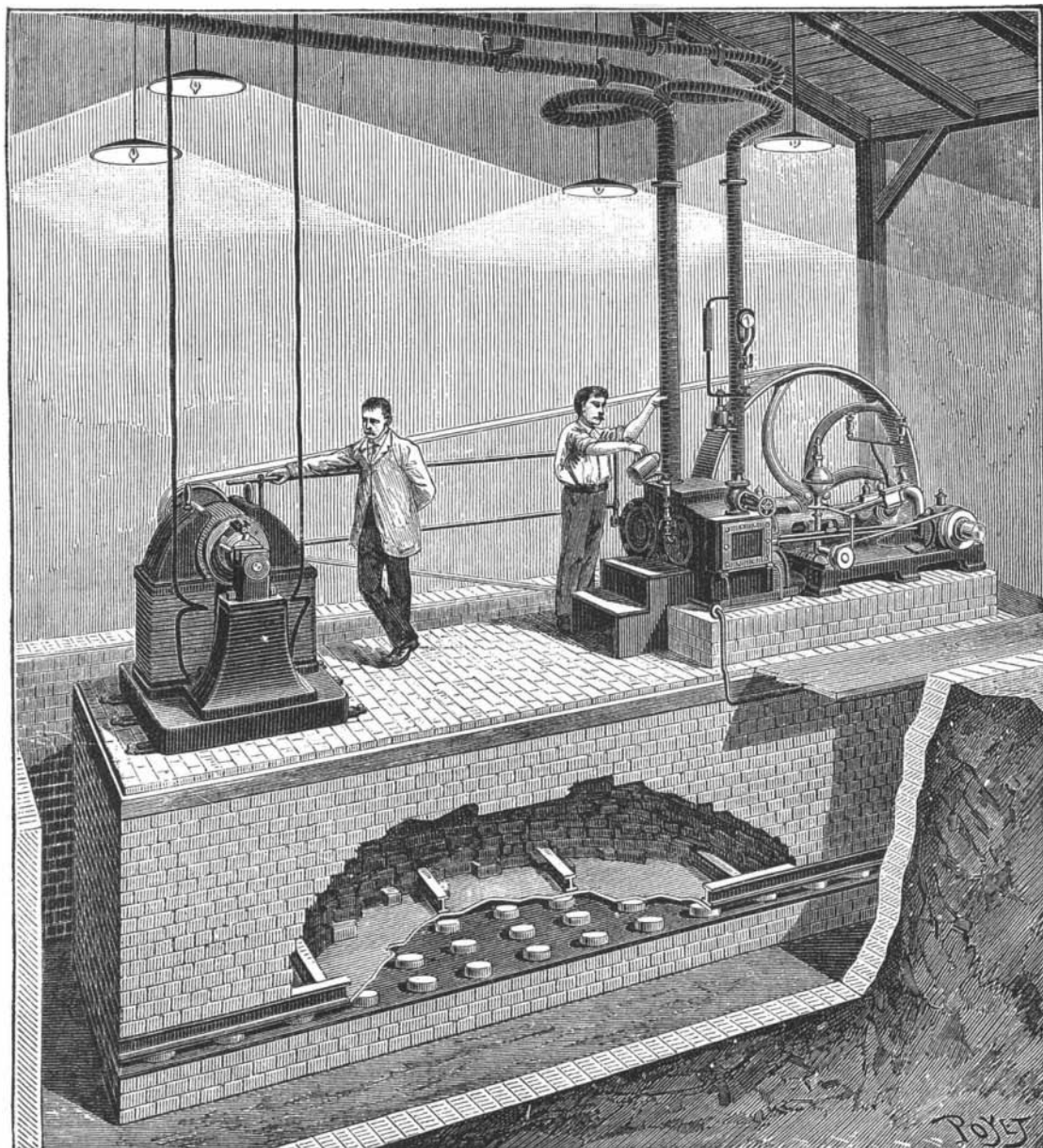
WEEKE'S SYSTEM OF BUILDING DIKES.

between the axle and the spring of carriages, gives a complete and stable isolation, increases the ease of motion and the duration of service, diminishes the noise, and reduces the variations in the tractive stresses of the horses.

This rubber support serves to fix the spring firmly upon the axle, if it is a question of a vehicle, without interfering with the elasticity of the junction by too much tightening, a drawback connected with all the arrangements hitherto employed. This result is obtained by means of a mode of attachment which interposes (1) an isolating rubber tube between the coupling plate and axle; (2) of a foundation disk of rubber supporting the load; and (3) of a reaction disk which isolates the nut and lessens the rebounding. The compression between the metallic parts is effected without crushing the metallic joint.—*La Nature.*

## WEEKE'S SYSTEM OF BUILDING DIKES.

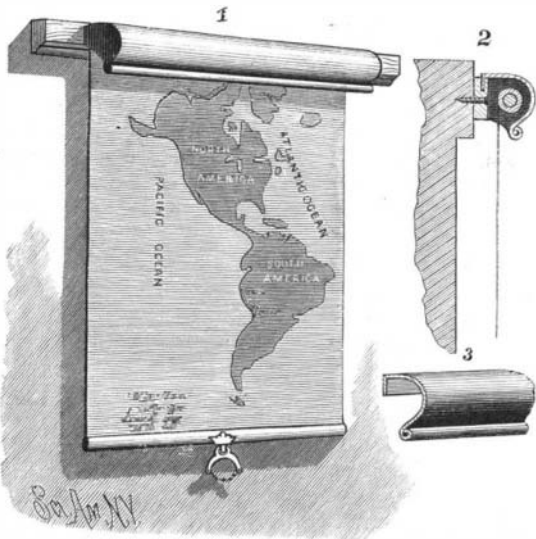
The dike illustrated in the accompanying engraving is admirably adapted for use at places where the water is of considerable depth. It consists primarily of a floating frame made of wood, and which is provided with barrels or other suitable floats. This frame is anchored by lines or piles. The work of building up the dike is carried on upon this floating frame, and above water line, the structure being gradually submerged as the superincumbent weight increases. A thick layer of rails, brush, willows, poles, or other similar material is placed upon this frame, and one or more similar layers are placed upon this transversely. These layers are lashed to the frame by wires and clamp timbers. Upon this structure is mounted an inclined trestle or frame, as shown in the cut, of



ELASTIC SUSPENSION OF MACHINES.



a height sufficient to bring it above high water mark. Layers of brush, willows, reeds, etc., are lashed vertically to the trestle by means of horizontal stringers bound to the frame of the trestle as shown. The trestle frame is then filled with stones and gradually sunk.

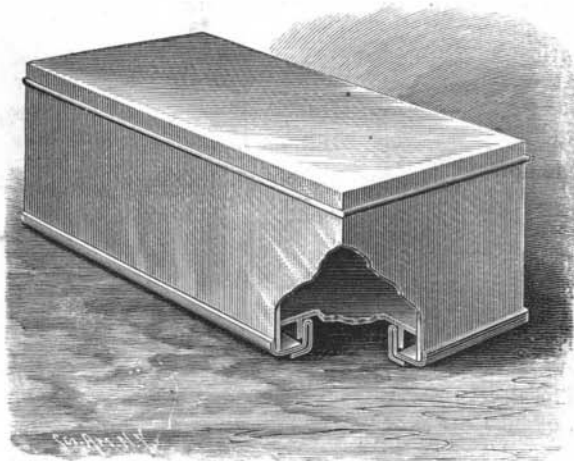


BULLARD'S EXHIBITOR FOR WINDOW SHADES, ETC.

The weight of the stones will be sufficient to retain the dike firmly in position. A bundle of reeds or willows is bound to the frame at the point of intersection of the vertical and horizontal layers of reeds to prevent the water from flowing between these layers, and a pile of stones from two to four feet high is piled upon this to keep it in place. This system has been patented by Mr. Henry C. Weeke, of St. Charles, Mo.

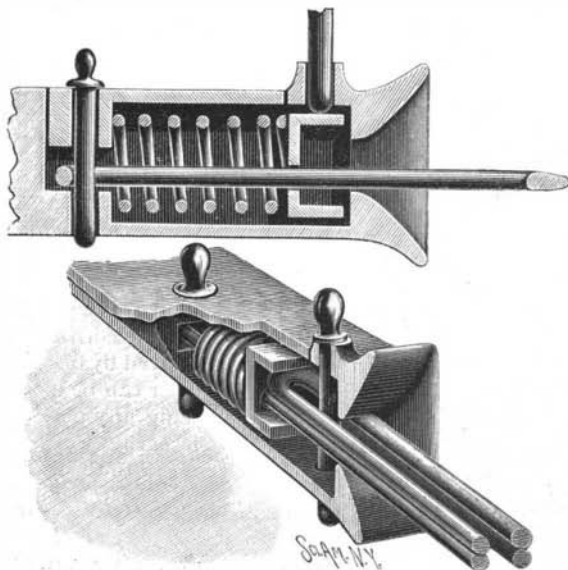
**A BOX TO HOLD BRICKS OF ICE CREAM.**

A box for containing bricks of ice cream, and which will admit of the cream being dislodged from the box with neatness and dispatch, is illustrated herewith, and has been patented by Mr. James Van Dyk, of No. 116 Bridge Street, Brooklyn, N. Y. The cover may be



VAN DYK'S ICE CREAM BOX.

of any approved construction, but the bottom is movable, of a form to fit snugly within the box, and has a downwardly extending flange a little distance from the edge. At the bottom of the body of the box is formed a flange adapted to constitute a seat for the movable bottom, and also a channel between the flange and the body of the box, the flanges being so formed and arranged that the one will fit snugly within the other. The body of the box is made gradually wider from the bottom upward, so that as the movable bottom is pressed up, acting as a follower to the cream, the latter need only to be started to loosen it and permit its ready removal. To retain the bottom within the box, and obviate the possibility of its misplacement or injury, retainers, not shown in the illustration, are secured to the inner surface of the body of the box, each formed of sheet tin or like sharp material,



CLARRIDGE'S CAR COUPLING.

whose sharp edge will present but little resistance to the cream, and will not mar its appearance.

**AN IMPROVED EXHIBITOR FOR SHADES, MAPS, ETC.**

A readily attachable device, which will effectually conceal a shade when rolled up and shield it from light and dust, is illustrated herewith, and has been patented by Mr. Edwin A. Bullard, of Vassar, Mich. The fixtures of a spring curtain roller are secured upon the face of a strip of wood, a number of which strips may be arranged in succession over the shelving. In the upper edge of the strips is a groove, to receive and retain in position over the curtain fixtures and roller a protector, consisting of a piece of sheet metal or equivalent material, bent to form a semi-cylindrical body, as shown in Fig. 3, the manner of attachment being shown in the sectional view, Fig. 2. When a series of such covers are in position they will form a moulding as far as they extend. These exhibitors may also be used in connection with curtain fixtures of dwelling houses, the protector being put up the full width of the curtain, and the slats secured to the casing of a wide or narrow window.

**AN IMPROVED CAR COUPLING.**

An automatic car-coupling, employing ordinary coupling pins and links, with the drawbar of about the form of those already in use, is illustrated herewith, and has been patented by Mr. John Clarridge, Sr., of Libertyville, Iowa. The draw bar has the usual flaring mouth, but with the inner part reduced in size to form a guide for the link, the chamber for receiving which contains a spring. In the rear of the chamber are shoulders to act as an abutment for the spring, and in its mouth are shoulders to limit the motion of a follower pressed forward by the spring, this follower consisting of a plate bent twice at right angles, and having an oblong aperture to admit a link. At the rear of the chamber are vertical apertures for receiving a coupling pin to permanently retain a link in place in the drawbar, the follower then, when the coupling is ready to be connected with another coupling, being in the position indicated in the sectional view, and forming a support for a coupling pin, for which vertical apertures are provided in the forward part of the drawhead. The outer end of each link is beveled, so that when it approaches another link similarly supported it will not be liable to collide with it, but will slip past, either above or below it. When the cars approach each other, the parts being arranged as shown in the sectional view, the link carried by each drawbar enters the other drawbar and pushes back the follower against the pressure of the spring, allowing the outer pins supported by the followers to fall through the links thus introduced, and automatically effecting the coupling.

**KANE'S CAR BRAKE.**

Mr. George O. Kane, of No. 193 Thurbus Avenue, Providence, R. I., is the patentee of an improved brake for railroad cars in which the brake shoe is applied to the track instead of to the wheel of the car. By this method the wear upon the wheels from friction with the shoe and sliding on the track is avoided. The entire weight of the loaded car bearing upon the brake shoe brings the car and train to a sudden stop. Two pairs of oppositely arranged brake shoes are pivoted at one end to a depending frame on each side of the car, the other end of each shoe being connected with the lower extremity of a toggle joint. The upper arms of the toggle joints are pivoted to the car frames, while the joints are attached to opposite ends of the brake beams, so that when the brake beams are made to approach one another, the angle of the toggle joint is increased and the shoe is lowered on to the track. As may be seen by examining the cut, between the brake beams fixed upon an immovable frame is pivoted a brake lever, which is united with the brake beam by connecting rods, so that when the brake lever is turned by means of the brake rods, that connect the ends of the lever with the brake on the platform of the car, the two brake beams will be made to approach one another, straightening the toggle joints, and the brakes will be forthwith applied. The rods connecting the brake beam with the brake levers are provided with springs at their outer ends.

**ANCEL'S STOVE PIPE AND TENT SUPPORT.**

In the device illustrated in the accompanying engraving, the smoke pipe of the stove is used as the support of the tent. This device has been patented by Mr. John W. Ancel, of Fort Buford, Dakota. The stove pipe is made telescopic, the smaller sections at the top being made to slide inside of the sections under it. Each section at its extremities is provided with holes into which are inserted screw-threaded pins for locking the pipe in position. The stove may be of any desired type. The top section of the pipe has a sleeve provided with a flange from which is suspended the heavy ring which carries the tent proper. This sleeve is removable, and is likewise locked in position by means of a pin. A bell-like shield caps the whole to prevent rain or snow from entering the opening at the top of the tent. The sections of the pipe are made flanging at the bottom and are bent in at the top so as

to make the joints tight-fitting. By this device the smoke is carried away and the tent is thoroughly ventilated, while the ordinary tent pole is done away with. When traveling, the pipe may be folded and packed

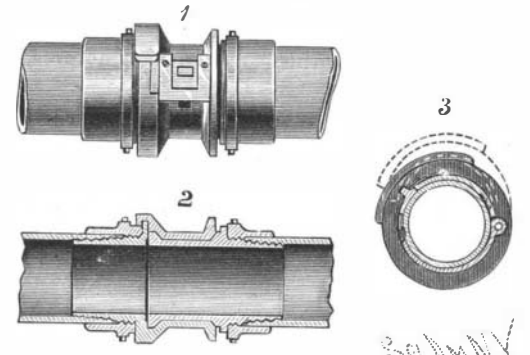


COMBINED STOVE PIPE AND TENT SUPPORT.

away into very small space, occupying no more room in fact than the largest pipe section.

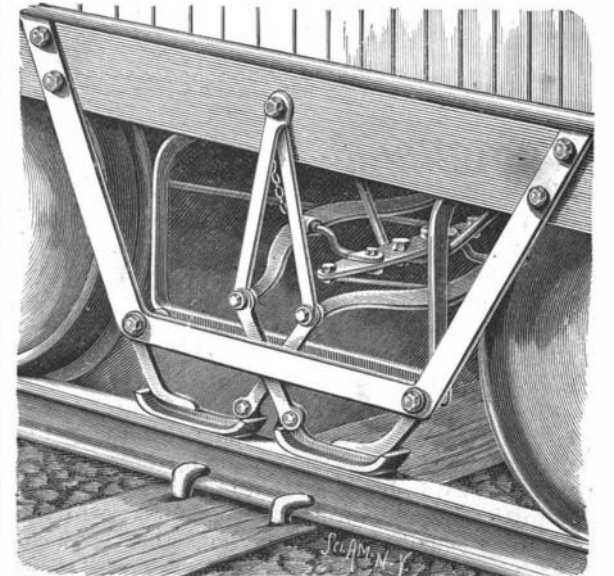
**AN IMPROVED HOSE COUPLING.**

The illustration herewith represents a hose coupling designed to be simple in construction and efficient in operation. It has been patented by Mr. James D. Sloan, of Rushville, Ind. Fig. 1 represents a side view and Fig. 2 a longitudinal section of the coupling engaging two pieces of hose, while Fig. 3 represents a cross section. Collars, internally screw-threaded, are engaged on the respective ends of the hose, each hose being then engaged to the corrugated ends of a coupling, each collar being shorter than the corrugated ends of the coupling, permitting the outer end of each corrugated part to expand on the inside of the hose, and cause the hose to expand over the outer edge of each collar. This feature, with the corrugations, forms a strong connection between the hose and coupling. The body of the



SLOAN'S HOSE COUPLING.

coupler has an end collar, a middle collar, with one part narrower than another, and external corrugations at one end, a part of the side at one end of the body being cut away, or provided with a large opening, to be closed by a hinge. When the hinge is closed, a yoke spring engages a lug on the body and locks the parts. When disengaged, a flat spring is exerted to open the hinge, the extent to which it may be opened being limited by a small lug, as shown in dotted lines in Fig. 3. When the hinge is open, the part corresponding with the pipe section, having two collars and threaded end, held in one end of the hose, may be engaged with the body or hinged part of the coupling. Then by closing the hinge and causing the yoke spring to engage with a lug on the body, the several parts of the coupling are firmly united.



IMPROVED CAR BRAKE.