Some Automobile Novelties.

STORM PROTECTION FOR THE AUTO DRIVER.

The latest addition to the equipment of a well-appointed car is the "cling tight storm apron," manufactured by the Beebe-Elliott Company of Racine, Wis., and shown in the accompanying illustration. The storm apron, designed to protect the driver of the car in cold or wet weather, is made of waterproof material, with a spring steel band to encircle the waist and another band to spring about the ankles. The apron cannot slip down from the waist, and if placed over the ordinary lap-robe, holds it snugly about the person of the driver in a manner never possible before. There is perfect freedom for the feet to operate the pedals on the floor of the car. The wind and water are kept out, and the comfort of a warm robe about the body is kept in. There are no straps or buttons or buckles to cause annoyance, and the apron may be put off or on in an instant.

A STORM APRON FOR CHAUFFEURS.

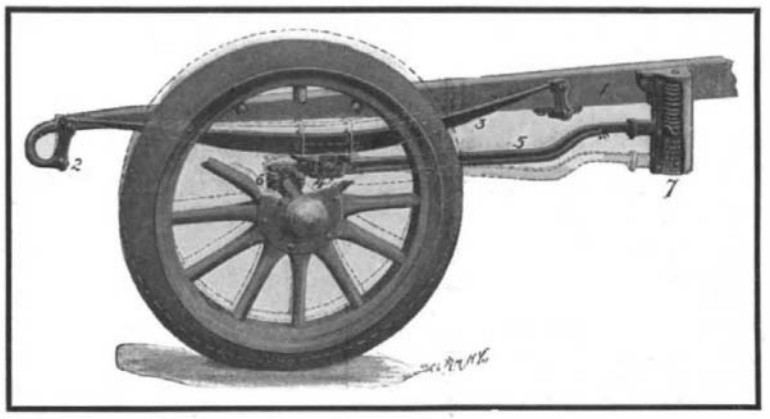
A NOVEL CARRYING CASE FOR AUTOMOBILE TIRES.

One of our illustrations shows a new metal carrying case for automobile tires, which offers several advantages over the ordinary rubber covering that is placed over a shoe. This case is made of pressed steel, and weighs only about 25 pounds. It is hinged so that the outer half can be opened instantly, as soon as the lock has been unfastened. The spare shoe can then be quickly removed if it is needed. In the center of the case there are two spaces, the upper one being for spare tubes, and the lower one for tools. These cases are made sufficiently large to accommodate two 4½x36-inch shoes, and the fact that they provide waterproof and burglar-proof holders for the tires and tools is sufficient to warrant almost any automobile user purchasing them. Added to these advantages is that of ready and quick accessibility when the tire is needed. At the recent Automobile Show in the Grand Central Palace, one of these cases made of spun copper was exhibited. Although it had been in use on a car for nearly 3,000 miles, there was practically no indication of this from its appearance. When made of pressed steel, these cases will be even more durable.

A NEW SUSPENSION FOR AUTOMOBILES.

The ordinary elliptical spring, if it could be made flexible enough, would serve as an excellent device for relieving an automobile body of the tossing to which it is subjected in passing over inequalities of the road and would save much tire and machinery trouble. Unfortunately, if the spring is sensitive, it is too weak, so that the body is bound to strike. It has, therefore, been the practice to make the spring so stiff that less comfort is obtainable. Moreover, even the stiff spring is not always able to cope with the violent tossing, for which reason shock absorbers have come into more or less general use. It is the purpose of the shock absorber to relieve the elliptical spring of unusual strains, which purpose it accomplishes either by friction devices, or recoil cylinders.

Mr. Oscar Stolp, of 20 Fletcher Street, New York, N. Y., has adopted an entirely new means of overcoming the suspension problem. In his device he abandons friction devices and recoil cylinders and employs instead a very simple equalizing lever which dissipates the tossing effect, not by causing it to overcome friction or compress air or a liquid, but by changing its direction and causing it to expend itself in holding the car down on the road. The accompanying illustration shows the device. To the chassis 1, an elliptical spring 3 is secured by hangers 2. The axle 6 is mounted not at the center of the elliptical spring, but at the end of an equalizing lever 5, which is fulcrumed at 4 (the center of the elliptical spring). The other end of the equalizing lever is connected with a coil spring inclosed in a case 7. When the car strikes a depression the short arm of the equalizing lever is thrown up and the long arm down, thereby distending the coil spring and pulling the chassis down. The result is that the elliptical springs are entirely relieved of strain, so that they can be made sensitive and responsive. This new lever suspension has the merit of adapting itself to the character of the road, for it is obvious that the arm 5 will be rocked to a degree corresponding with the tossing effect. The inventor of this device has traveled over 20,000 miles on a car fitted with solid rubber tires and claims that he rides as comfortably in his vehicle, if not more so, than would be possible with an ordinary shock absorber on a pneumatic tired car. The device would seem to be particularly applicable to the high-speed roadsters which are now so popular—cars which are apt to leave the road when they strike a very slight obstacle and which obviously need some mechanical device for holding them down.



THE STOLP EQUALIZING SUSPENSION LEVER.

The dotted lines show the position of the parts when displaced by an inequality in the road.

A NOVEL SPEED-CHANGING GEAR.

A novel speed-changing gear has been patented by Joseph A. Wilkin, of Matamoras, Pa., which is adapted for use on machine tools, automobiles, and motor boats. The device has been examined by Prof. Arthur L. Williston, who reports that in his opinion it is "thoroughly mechanical in principle and altogether practical; it is positive in its action; it is simple and effective in its operation; and it has many advantages not possessed by any other change speed mechanism."

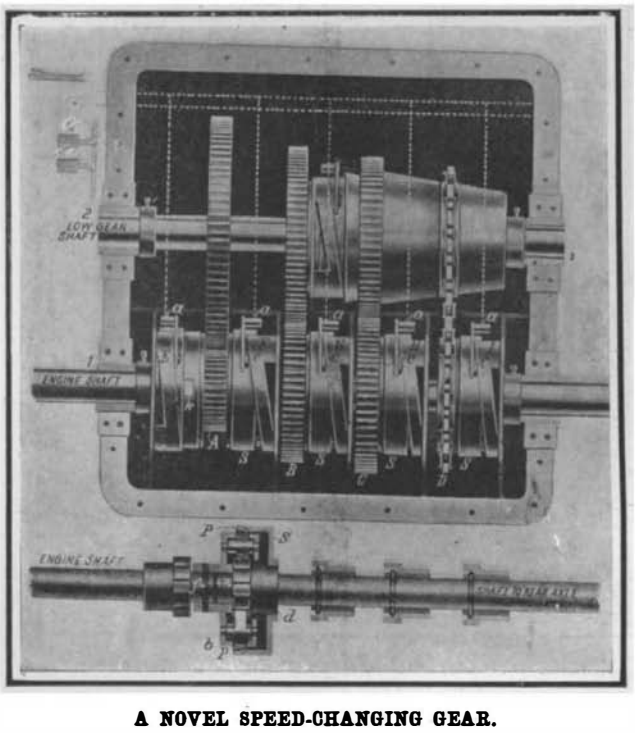
In the accompanying illustration the device is shown applied to the transmission of an automobile. The engine shaft and the shaft to the rear axle or main driven shaft are in alinement but separated. The engine shaft carries a gear *A;* the rear axle shaft carries the gears *B* and *C* and the sprocket *D*. These three gears and the sprocket are loosely mounted on their respective shafts, but any of them can be made fast by moving the lever *a* of the appropriate clutch. The corresponding or mating three gears and sprocket wheel mounted on the countershaft and low gear shaft above the engine shaft, are all fixed, except for the provision of a slip clutch.

The engine shaft may drive the rear axle shaft through either pair of gears *A* and *B* or *A* and *C*, or may drive it in the reverse direction through the gear *A* and the sprocket *D*, simply by throwing the levers of the appropriate clutches and making the proper gears or sprockets fast to the engine and the driven shaft. The reverse motion of the driven shaft may also be obtained by means of two sprocket wheels and a chain, or by means of two gears in place of these sprockets with an idler running between them on an independent shaft.

The clutch which connects the gears with the driving or driven shaft is shown separately. Securely keyed to the shaft is a bushing to which a ratchet wheel *d* is attached. On the face of the gear a disk *b* is fixed, which is provided with four pawls *p*, so located that they may engage in the ratchet wheel simultaneously at four points equidistant on its circumference. By throwing these pawls in or out, therefore, the gears or sprocket may be made fast to or released from the shaft. The pawls may be held in action either by springs or by a pressure created on them through lugs located on their hubs by the driven or the driving gear. The operation of the pawls is controlled by a sleeve *S*, conical on the inside, which moves to the right or to the left longitudinally with the shaft and which permits them to engage in the ratchet wheel or holds them out of mesh with it. These conical sleeves are shown at *S* in the upper view. On their outer surface there

(Continued on page 67.)

A NOVEL TIRE-CARRYING CASE.



A NOVEL SPEED-CHANGING GEAR.

The gears are always in mesh and it is possible to change directly from a low to a high speed.