with air. After the tire is filled to the proper degree of hardness, the material is allowed to set, in which process it must undergo a chemical change, so that it cannot again be melted by heat. At the present time the greatest difficulty with a tire filling is that the wheels, tires, and tubes must be sent to the factory for filling. A properly filled tire rides about as easily as an air-filled tire at the same pressure, while the advantages in favor of the filled tire are many. Punctures obviously cannot have any effect upon it.

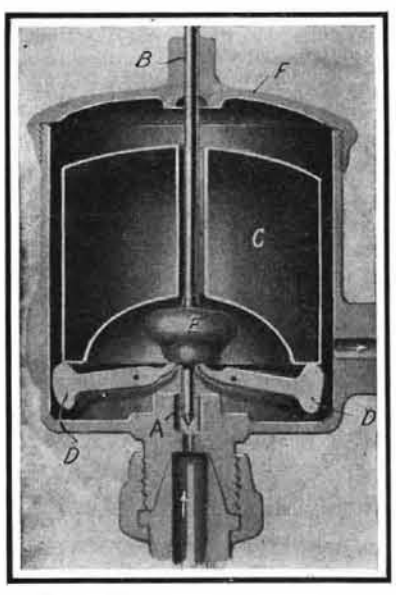
Spring wheels nearly always have an ordinary felloe and rim equipped with a solid rubber tire. Within the wheel arrangements of springs are designed to take up the shock and vibration (Figs. 20 and 21). The most common defect of spring wheels is that while they may be resilient, they do not hold the rim and tire strictly at right angles to the axle. Then again, any mechanism depending upon springs for its action is only as reliable as the spring.

Attempts have been made to introduce special wheels (usually shod with a solid tire) which depend for their resiliency upon a pneumatic tube or tire about the hub or within the felloe of the wheel. Combinations of this kind are expensive, and none of them have become very well known commercially.

The tire problem is the most serious one which the manufacturer and the automobilist have to face to-day. There is no question but hundreds of people would become users of the automobile if they were not afraid of the great expense and uncertainty of pneumatic tires.

CORRECTING A LEAKY CARBURETER FLOAT VALVE.

A carbureter float valve may leak for various reasons. There may be dirt in it, in which case a good flushing out with gasoline will stop the trouble. The connection between the float and the valve may be of such a character that the vertical movement of the float causes the valve to rock slightly on its seat. Such a valve is practically impossible to keep tight. The connection between the float and the valve may be bent or badly adjusted, so that the float is unable to close the valve. As shown, the float *A* has a



CORRECTING A LEAKY CARBURETER FLOAT VALVE.

long weighted stem *B*, and shuts off by its own weight the gasoline entering from below. This valve is held open by the float *C*, which rests on two small levers *D D*, the inner ends of which lift upward against the weight *E* of the float valve. The float is supposed to rise sufficiently to let the valve close when the gasoline level is just below the top of the spray nozzle (not shown in the figure). Something may happen, however, to disturb this relation. For example, the weight *E*, which is usually threaded on the stem *B*, may become loose, so that while the weight is held up by the levers, the stem gradually screws itself down through *E* and closes the valve. On the other hand, the top of the float may, in some manner, strike the cover *F* of the float chamber, or the small ends of the levers *D D* may strike the bottom of the float chamber before the valve is closed.

Sometimes the valve simply leaks, and has to be ground in with pumice stone. This is a somewhat delicate process, and requires keeping the stem *B* as near the center as possible while the grinding is being done. By unscrewing the cover *F*, one can generally tell where the trouble lies. For example, if pressing down the stem *B* stops the dripping, it is evident that the trouble is in the float or its connections.

A metal carbureter float such as shown in the cut may have a minute leak, through which gasoline gradually enters and weights the float, so that it does not rise sufficiently to close the needle valve *A* at the proper gasoline level. Shaking the float will disclose the trouble. The remedy is to warm the float in a moderate oven until all the gasoline has evaporated out. While the drying out is in process, dip the float in warm water; the escape of bubbles will show where the leak is. After the float is dried out, allow it to cool and carefully solder the leak.

GETTING HOME WITH A BROKEN UNIVERSAL JOINT.

All cars in which the rear axle is driven through bevel gears have a propeller shaft transmitting power from the engine or transmission gears to the bevel pinions and gear. This propeller shaft has a universal joint at one or both ends, and sometimes the pin or bolt through this joint breaks. The obvious expedient is to hunt up a temporary bolt of any sort which will go through, and usually this is the best that can be done. Sometimes, however, not even an ordinary iron bolt is to be found, and in that case one may get along by making up a bundle of fairly thick iron wire, such as telegraph wire. This bundle, as large as will collectively enter the hole, is bound securely at its ends, and the ends of the wires are then splayed out and turned over. Evidently cautious driving is required with such a makeshift, but it has been done successfully.

SUPPRESSING RATTLE IN BRAKES, MUD GUARDS, ETC.

Most noises due to loose brake shoes and miscellaneous control members about the car are easily traced, and their correction demands only a little time and common sense. Sometimes leather may be used to quiet a part that rattles. Sometimes a tension spring will do the work. Sometimes bearing pins wear loose in their holes, and the latter must be reamed and larger pins inserted. Sometimes the mud guards work loose. A somewhat troublesome problem is presented by an aluminium mud guard which has cracked from vibration. It must be braced and held by small bolts with large heads, rather than by too large bolts with small heads, as it is dangerous to put much strain on material so soft and brittle as aluminium. It is an excellent plan to use leather washers next to aluminium mud guards, dash boards, etc., wherever bolts go through.

A NOVEL GASOLINE STRAINER.

Most carbureter troubles are caused by dirt or water, which has found its way into the carbureter. When trouble of this kind occurs, the motor usually stops. The crank is turned a few times, and then the carbureter is taken apart, with the result that in reassembling, the parts fail to readjust themselves properly.

In order to overcome this difficulty the Austro-American Separator Company of Cleveland, Ohio, have introduced a funnel which separates all water and dirt from gasoline. The separating is accomplished by the use of two pockets, in which water and dirt accumulate on account of their greater specific gravity, and by the use of two very fine, specially woven water-separating gauzes. Gasoline runs through this funnel much faster