

patible with wartime orders, to dispense with any awe-inspiring insignia of rank. Patients will not respond if they think they are being ordered to "get well" by a superior officer. This is in line with Navy usage regarding titles. Doctors are referred to and addressed as "Dr. So-and-So" rather than Captain or Commander.

According to British experience, it is vital for volunteer defense workers to inspire confidence in bomb-shocked civilians and encourage them to pour out a

complete story of their frightful experience. Organized "listeners" are being trained in England for this purpose. It is the best preventive, say modern psychiatrists, for severe war neuroses, particularly if the victim can be encouraged to express his emotions freely.

Just as everyone finds it easier to tell his troubles to a sympathetic neighbor than to a policeman, many women war workers will find they can be of greater service by not wearing uniforms.

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for most people to this day. Perhaps it did not have a fair trial.

Saving of punctures rather than saving of rubber being the main object, most of these ancient spring wheels were equipped with solid rubber tires. In that case it is hard to see any advantage in putting the springs and shock-absorbers on the wheel rather than on the vehicle. If on the vehicle, the waste and expense of throwing away the old wheels and manufacturing innumerable new ones, using up critical materials, would be avoided.

When rubber or some similar material is put on automobile wheels, half the problem of taking out the vibrations is already solved. Rubber absorbs the small high-frequency vibrations—the kind that produce sound. That is why the rubber-clad wheel is silent while the steel-clad wheel is noisy and grinding. Springs and shock-absorbers of appreciable dimensions take up only the jolts and major vibrations. The short-period ones pass through the system almost as though it were a rigid body, and are communicated to the vehicle. In time they shake the car to pieces, loosening the nuts and screws.

In the old-time automobile, nuts and screws had to be tightened frequently. But this was due to poor engine balance, not to inefficiency of the tires. Enormous progress has been made in late years in engine balance, particularly in damping out these high-frequency vibrations.

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#### ENGINEERING

## Rubberless Wheels Are Not Considered Generally Practical

### Spring Wheels, Originally Intended To Reduce Number Of Punctures or Blowouts, Might Be Used on Rural Roads

**W**ILL the rubberless wheel, the automobile wheel with springs and shock-absorbers, take the place of the rubber tire? Some think it will to a limited extent if the rubber shortage continues. Others believe it is utterly impractical.

If no rubber were available, some government engineers believe we would have to come to some such thing, whatever its disadvantages and discomforts, or else return to the horse and buggy era, if we could get the horses and the buggies. Before that point is reached, the spring wheel might find some use on trucks, farm wagons and even on passenger cars in the rural districts.

One such wheel has proved relatively adequate under rural conditions. It does not, to be sure, provide the smooth riding

qualities or permit the high speeds of the most modern streamlined cars. No rubberless wheel can do that. It is a question of how much discomfort and inconvenience we are willing to endure in order to save rubber for war purposes.

At the National Bureau of Standards, the spring wheel was pronounced to be "out of the question." The main obstacle, they said, was excessive wear—of road surface, wheel and vehicle. Rubberless wheels on heavy vehicles are not permitted on hard surfaced roads in any part of the country, and the load restrictions on solid rubber tires have been so increased that nearly all trucks have abandoned the solid for the pneumatic tire. While a spring wheel could be designed that would accomplish a large part of what the pneumatic tire does, it would be complicated and expensive and still inferior to a small rubber tire of the most inferior grade. It could not compete even with such a tire.

In the early days of automobiles there was a huge crop of spring wheels. The files of the U. S. Patent Office are full of these inventions. Most of them are on the "crackpot" side, but a few had merit. The chief incentive in those days was to avoid the frequency of punctures and blowouts in the tires then used. And in the absence of shock absorbers and snubbers, some of these wheels might have done as well. But with improvement in tires and the addition of these devices, the spring wheel was pronounced impractical and so has remained

#### ENTOMOLOGY

## Fumigant Kills Insects In Stored Grain and Flour

**A** NEW fumigant for grain and flour, highly penetrating, deadly to insects but harmless to humans, is announced by the University of New Hampshire. It is known to chemists as chlorinated nitroethane.

The compound is a clear liquid with distinct but not disagreeable odor, stated to be safe to ship in ordinary containers. It evaporates readily on exposure to the air, and the fumes penetrate quickly into even large masses of grain or flour. A simple method of fumigating grain in cars consists merely in putting the chemical on top of the grain and then sealing the car.

Fumigation costs are said to be low, with no special apparatus required. The last traces of odor quickly leave the fumigated products after brief exposure to air.

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