

FRENCH MILITARY FOLDING BICYCLE.

Both the bicycle and automobile are meeting with favor from the army authorities in Europe. The bicycle has ceased to be considered purely as a means of locomotion for pleasure, and is now regarded as an efficient mount for soldiers. For scouting and the conveyance of dispatches, the bicycle is without a rival, being noiseless, occupying small space and affording a very insignificant target to the rifle fire of the foe. It is reliable, and a bicycle company or division is very mobile. The wheel also affords the enormous advantage over the horse in that it requires no forage supplies.

At the recent maneuvers of the French army the bicycle demonstrated its great value. The wheel which we illustrate was invented by Capt. Gerard, of the French army, and can be folded up and carried on the back. The frame is strengthened by a second tube running parallel with the first, thus giving the machine great rigidity. These two tubes, owing to their considerable diameter, reduce the vibration that plays so great a part in the expenditure of energy by the bicyclist. At the center of the right-hand side of the parallelogram forming the frame, there is a ball joint. Each of the parallel tubes is divided in the center, and the ends, which are beveled, are held in place, when the machine is opened, by coupling sockets. When the ends of the tubes are exposed by loosening the sockets and shoving them back upon the rings, the front part of the bicycle can be folded around onto the rear half, the wheels being superimposed. If desired, the bicycle may be divided into two parts, while the handle bar can be removed from the steering head. A novel form of brake is also provided. The wheel is of such a height that the bicyclist can maintain such a position in the saddle that he can at any moment touch the ground with his feet.

OILED ROADBEDS.

BY WALDON FAWCETT.

The plan of making roads dustless by incorporating crude oil into the dust of an ordinary earth road for the purpose of holding the dust down and securing a permanent roadbed has been introduced successfully on highways in various parts of the country, particularly in California, and the same scheme is now being utilized to secure dustless roadbeds on several of the principal railroads of the country. In the case of these steam roads, the officials in most instances made a trial of the dustless process purely as an experiment, and were, at the outset, far from sanguine of success; but the system has proved so satisfactory that it is being rapidly extended, and at the present time there is an aggregate of over one thousand miles of oiled roadbed on the various railroad lines of the United States.

For the operation of oiling a roadbed the sprinkling machinery is attached to an ordinary flat car, and the regular railroad employes are capable with a little instruction of manipulating it satisfactorily. The oil-sprinkling car proper is simply for carrying and manip-

ulating the sprinkler, the oil being stored in ordinary commercial tank cars. Extending the length of the car is a four-inch pipe with provision at either end for making connection by means of rubber hose with the oil supply. The main pipe is connected near the

when in extended position, they reach out on either side over the slight embankment on which a railroad roadbed is usually placed; whereas when the car is in a cut they reach up the slope on either side to a height of two or three feet. The oil escapes through slits, each about three inches in length by one inch wide, cut in the under sides of the three pipes comprising the sprinkling mechanism.

The side arms of the sprinkler are each supported at the outer end by a chain controlled by a hand wheel, so that they can be readily raised or lowered to conform to the character of the roadbed. Moreover, each side sprinkler is yieldingly held, so that no serious damage is likely to result should it strike an obstruction. To control the flow of oil from each pipe there is provided a two-inch, quick-acting gate valve, worked by a lever, and these are supplemented by globe valves fitted to the main supply pipe at either end of the car, to which there may be attached, should it be found desirable, lengths of rubber hose fitted with hand sprayers. The latter are frequently of service in sprinkling portions of the roadbed beyond the reach of the fixed pipes, and can of course be utilized in the event of the temporary derangement of any of the regular apparatus.

For oiling a roadbed a train is made up of a locomotive, one of possibly two tank cars for carrying the supply of oil, and the sprinkling car proper. With so light a train it is possible for the locomotive to also supply steam or compressed air to aid in ejecting the oil, although this is very seldom necessary. The oiling train usually proceeds at a speed of about four miles an hour, and an average of two thousand gallons of oil a mile is used.

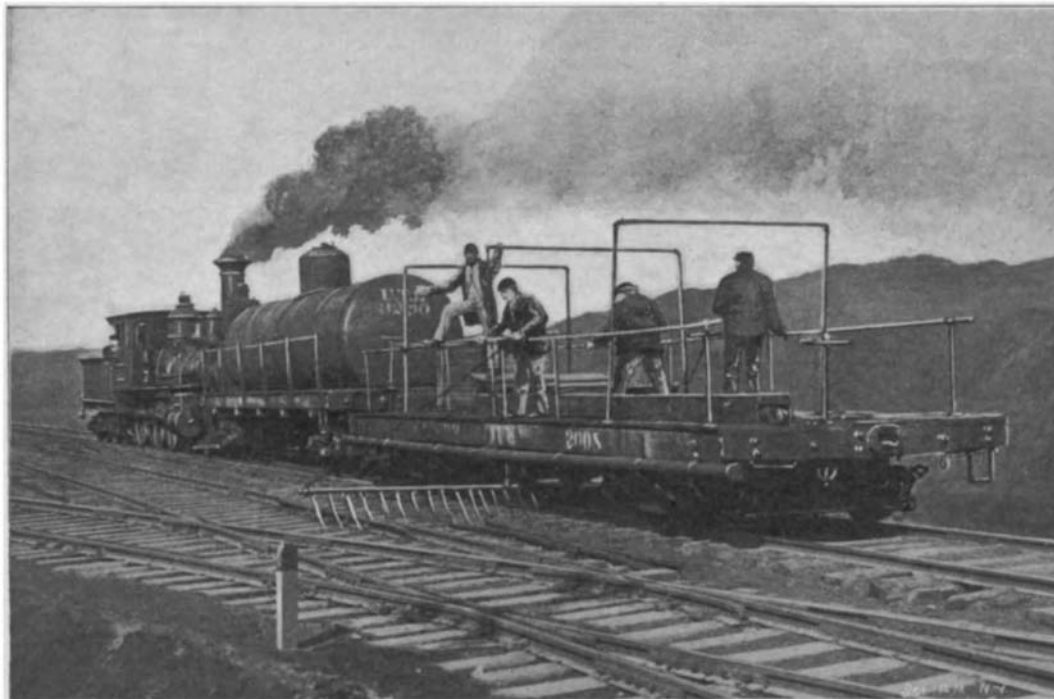
For sprinkling purposes there is now manufactured a special, non-inflammable, and practically odorless oil, which is of an exceedingly high fire test and low gravity, thus virtually eliminating all danger of combustion. Some odor is noticeable after application; but this disappears within a few days. When a stretch of roadbed is oiled for the first time the expense entailed for oil ranges from \$32 to \$45 a mile, according to the distance the oil must be transported; but subsequent sprinklings do not need to be so thorough, and the annual expense for oil seldom exceeds \$16. Of course it is highly essential that no oil come in contact with the rails, and to preclude the possibility of this, shields almost two feet in length are fitted on the sprinkling car above each rail.

The main advantages claimed for oiled roadbeds are found in the reduced expense of track maintenance and the preservation of ballast. The oil destroys all grass, weeds, and vegetation in the ballast; forms a waterproof covering or soft crust, which prevents water from penetrating below the surface, and consequently prevents the loss of ballast by abrasion from rains and floods; prevents frost in the ballast with the consequent "heaving" of the track, and by providing a water-repelling coating preserves the cross-ties. The reduction of

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middle of the car with a branch pipe, which in turn carries the oil to three sections of two-inch pipe, which constitute the sprinkling device.

One of the two-inch pipes mentioned is suspended transversely below the car and extends the full length of the cross-ties. Swinging from either side of the car is one of the other sections of two-inch pipe, and

**VIEW OF COMPLETE OIL-SPRINKLING TRAIN, SHOWING SIDE SPRINKLER IN ACTION.****BEFORE OILING, SHOWING DUST RAISED BY EXPRESS TRAIN.****AFTER OILING, SPEED OF TRAIN 60 MILES PER HOUR.**