

COMBINED MUTOSCOPE AND TALKING MACHINE.

There are certain inventions of so common-sense a character that they immediately suggest the question, Why was not that thought of before? There is a natural relationship between phonographs or kindred machines and moving picture apparatus, since they both give a reproduction of life, though appealing to different senses. What could be more logical than to combine the two machines so that one would complement the other? This has just been done by Mr. L. P. Valiquet, of Newark, N. J., in the manner shown in our engraving. It is Mr. Valiquet's opinion that phonographs have about reached the acme of their popularity and many are beginning to tire of them, and that by adding the mutoscope feature there will be a revival of interest in the instruments and their popularity will receive a new boom. With this in view he has so designed the apparatus that the mutoscope attachment may be fitted to any standard phonograph either of the disk or of the cylinder type.

Our illustration shows a disk machine fitted with the moving picture attachment. The pictures are projected through the horn of the instrument. The usual elbow to which the horn is applied is removed and in its place a tubular tee is provided. In the forward end of this member the horn is secured. The member is also provided with the mechanism for operating the reel of pictures. The film is coiled up on a reel mounted above the tee tube and passes over the rear end of the tee to a take-up reel below. The film is moved past the end of the tee by operating a hand crank which actuates the necessary gearing to multiply the speed of travel. The gearing also actuates a shutter which vibrates up and down so as to interrupt the exposures in the usual manner. The lantern is mounted on a pair of horizontal bars which project to the rear and are supported at the extreme rear end on an adjustable vertical standard. Either gas or electricity may be used to furnish the light. It will be noted that the talking machine is unchanged with the exception that the elbow is replaced by the tee tube. The instrument thus combined is called a "photo-phone" and should furnish much entertainment, as the audience, whether in the home or in a public hall, will be able to see and hear at the same

time a comic performance, operatic production, and the like. We are informed that a large number of special films and records have been prepared with a special view to providing an entertaining combination of music or conversation with moving pictures.

The cylinder machine is similar in most respects to the disk machine, with the exception that a flexible connection is provided between the horn and the stylus so that the horn may remain stationary while the stylus travels from end to end of the cylinder.

A SIMPLE APPARATUS FOR GENERATING HYDROGEN.

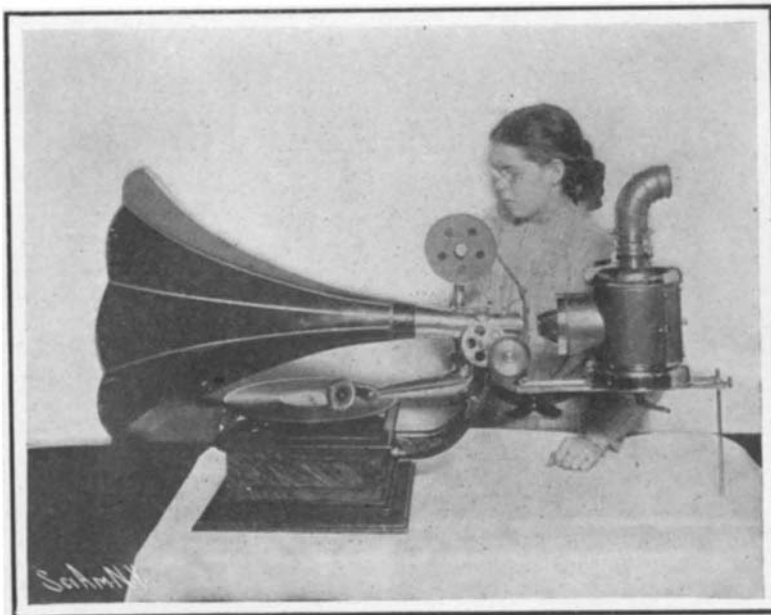
BY PROF. GUSTAVE MICHAUD, COSTA RICA STATE COLLEGE.

Broken pieces of aluminium table or kitchen ware can be used for several interesting chemical experiments. The following is a simple one: Buy from a druggist a foot or two of rubber tubing, a stopper with a small glass tube running through it and a few ounces of caustic potash or soda. Select a bottle to match the stopper and in it place the broken pieces of aluminium. Pour over them some lukewarm water and add a few spoonfuls of caustic soda. (This chemical is not so dangerous to handle as sulphuric acid, yet contact with the skin should be carefully avoided.) An effervescence will at once take place and will last for several hours in spite of the fact that the liquid is no longer lukewarm.

Hydrogen gas will be generated, escaping through the rubber tube, and the gas may be used for any of the experiments described in books on chemistry. It should not be ignited directly at the end of the tube

unless fully a quarter of an hour has elapsed after the beginning of the effervescence. *Disregard of this caution might cause an explosion on account of the oxygen left in the bottle.*

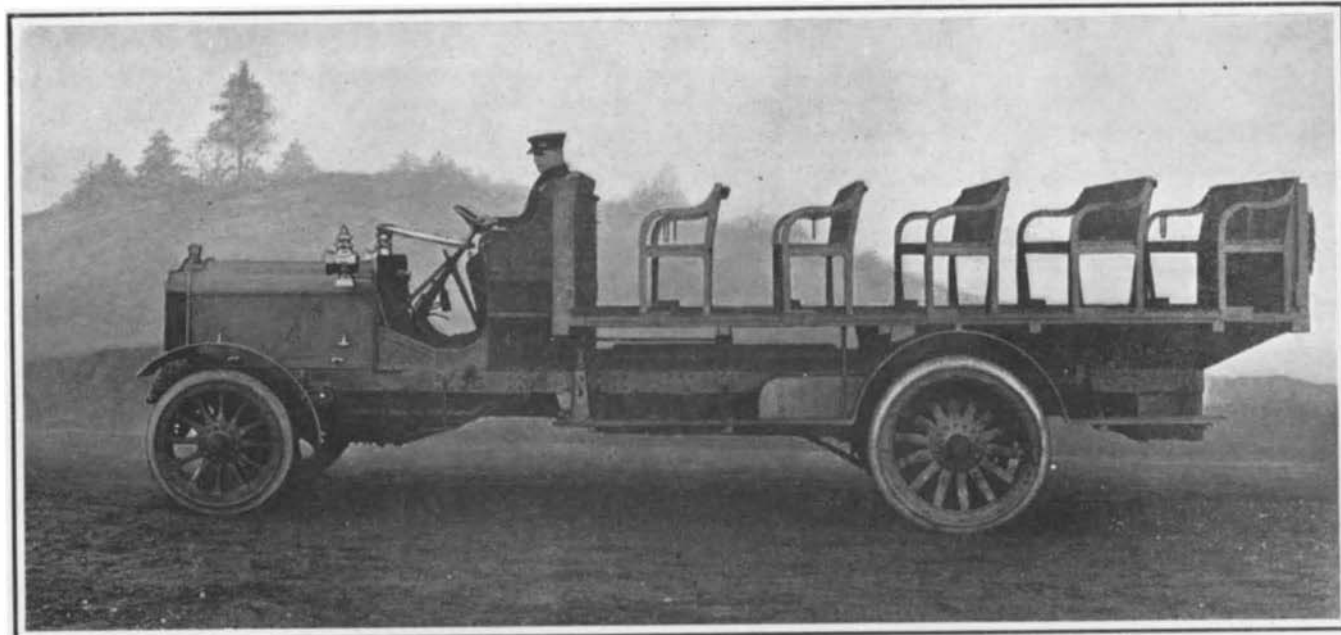
A given weight of aluminium displaces almost four



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times as much hydrogen as is evolved by the same weight of zinc, and some day, therefore, aluminium will be used instead of zinc for the industrial preparation of hydrogen. The method is at present more expensive than the ordinary zinc-and-acid process, yet it should be given the preference in several cases on account of the following two points of superiority:

1. The gas is free from hydrogen arsenide, hydrogen sulphide, and acid vapors. Its greater purity be-



A CONVERTIBLE MILITARY TRANSPORT MOTOR WAGON.

The vehicle will accommodate 25 men, or it may be converted into a baggage wagon.

comes especially apparent when it is used to inflate soap bubbles. With the classical apparatus the experiment cannot be made unless the gas is purified after leaving the bottle, because the acid vapors it carries along break the bubbles long before they reach any considerable size.

2. The apparatus is simpler and the operation easier than in the case of the zinc-and-acid process. There



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is no need of a Wolff bottle with a contrivance for the gradual addition of small amounts of one of the reagents. All the needed alkali is placed in the bottle at the outset, and the gas is generated continuously and regularly until the last bit of aluminium has disappeared.

CONVERTIBLE MILITARY TRANSPORT MOTOR WAGON.

BY OUR ENGLISH CORRESPONDENT.

The vehicle pictured in the accompanying engraving is expressly designed for military purposes for the transport of troops, or for the conveyance of baggage, stores, ammunition, etc. The conversion from one type to the other is effected in a few seconds, and if so desired, one-half of the wagon can be arranged to accommodate passengers, the other half being available for freight. The most important feature of the design is that no extra parts are required to convert it from one type of vehicle to the other. The seats are so arranged transversely that the passengers all face in the direction in which the car is traveling. Steel standards are fixed at each side, and on these the seats rest, the latter being made in two parts hinged together, one part forming a back rest, while when used as a baggage wagon, these standards serve as supports to the sides.

When it is desired to convert the vehicle from a passenger into a baggage wagon, the seats, which are portable, are lifted out and used to build up the sides of the vehicle. The necessary fastenings for securing the sides are already fitted, so that the complete change can be effected within two minutes. An important feature in the designing is that the seats are exactly half the length of the space which is required to be filled so as to change from passenger to baggage wagon. The seats have an over-all width of

15½ inches, with a similar clear space between each. Five rows of seats are available when the wagon is exclusively used for passenger purposes, and this provides accommodation for twenty-five men. Suitable clips are provided on the back of each seat for the housing of rifles.

The vehicle has an over-all length of 21 feet 3 inches and is driven by a four-cylinder 32-horsepower gasoline motor. The over-all width is 6 feet 9 inches, while the top of

the sides is 6 feet 9 inches above the ground. At the rear beneath the floor there is a toolbox, and a locker in which 6,000 rounds of rifle ammunition can be carried is also provided. Ringbolts are provided to permit of securing heavy and cumbersome piles of baggage with ropes if found necessary, and there are also two eyebolts large enough to take block and tackle. When used as a composite passenger and baggage vehicle, the seating accommodation comprises two rows of seats, the latter half of the car, 6½ feet in length, being used for stowing the baggage.

The commanding officer's seat is placed beside the driver, who is thus conveniently near for carrying out driving instructions, while to the dashboard is fitted a folding table for the use of the officer, who may desire to consult maps, etc., while in transit.

The convenient and handy nature of this car has recently been demonstrated. One of the volunteer battalions upon the Tyneside has acquired one of these vehicles and has found it highly serviceable for certain phases of military operations. Owing to its substantial construction, it is well adapted to the rigors of military service, though it is equally applicable to ordinary freight traffic. The vehicle was designed by Sir W. G. Armstrong, Whitworth & Company, the well-known British armament manufacturers.

Getting broken taps out, says a writer in the American Machinist, is, in one shop at least, performed by pouring hydrochloric acid into the hole. The acid is left there for about four minutes and enough of the tap and the hole is eaten away to loosen the tap.