New Machines And Gadgets

Novel Things for Better Living

You can test your spark plugs and determine the width of the spark gap without removing them from the engine, by means of a new ignition tester made in the form of a screwdriver. The device has been awarded a patent. There is a lamp in the transparent handle which flashes when proper contact with the spark plug and the engine is made —provided the ignition is working. A cylindrical band on the handle, when turned, gradually opens a secondary spark gap in the handle. When this gap corresponds to that in the engine, the lamp ceases to flash and the spark can be seen within the handle. A scale on the movable band tells the width of the spark gap.

Rubber gas tanks in place of aluminum are not for the purpose of contracting as gas shortages require, but to save aluminum and to provide self-sealing tanks for airplanes. Besides, they are not exactly made of rubber, but of a substance derived from rubber, a substance that is one-third as heavy as aluminum and two-thirds as strong. Bullet holes shot in these tanks seal almost immediately, preventing leakage of gasoline which is one of the main reasons why airplanes come down in flames.

Now you can shave and trim your hair too with the same electric razor. An attachment has been patented which slips over the business end of the razor, providing it with longer and larger teeth. It can be placed close to the cutters or a short distance from them, according to whether you wish to trim the hair from the back of your neck or your sideburns or from elsewhere on your head.

Policemen, it seems, sometimes carry a flashight in the tip of their nightsticks or billies. A patent has been awarded for an improvement in such an arrangement, the improvement consisting in a more convenient and accurate means of focusing the light so that it can look you straight in the eye without flickering.

A snowflake can be preserved in all its delicate detail in a very simple way. This does not mean a photograph or a reasonable facsimile, but an actual three-dimensional replica. Catch a snowflake on a piece of black velvet, lift the flake carefully with a toothpick and transfer it to a microscope slide on which has been placed a drop of a weak solution of a suitable resin. If the flake is large, an additional drop of the resin may be placed on top. All this must be done outdoors and everything used must be cooled below the freezing temperature. Good results have been obtained with a one per cent. solution of polyvinal formal resin dissolved in ethylene dichloride. When the solvent evaporates it leaves a replica of the snowflake that can be preserved indefinitely.

Lots more fun can be had with a toy train when equipped with a remote control device that has recently been patented. From a single convenient location in the room all operations of the train can be controlled. It can be made to go forwards or backwards at different speeds. The lights on the train can be switched on or off without leaving your seat. The mechanism works on the principle of the telephone dial. You dial your order and a mechanism on the train similar to that used in the actual telephone service is actuated according to the number of impulses sent by the dial in returning to its initial position.

To warn soldiers of poison gas, and to signal them to put on their gas masks, a small hand-cranked siren is being manufactured by a Chicago company. The government, it is said, has ordered 30,000 and plans to provide each group of 60 soldiers with a siren alarm.

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St. N. W., Washington, D. C., and ask for Gadget Bulletin 77.*

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● RADIO

Thursday, November 6, 3:45 p.m., EST

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Frank B. Jewett, president of the National Academy of Sciences, will discuss the relation of industry to fundamental research.

Listen in each Thursday.

Monday, November 10, 9:30 p.m., EST

Science Clubs of America program over WRUL, Boston, on 6.04 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Have your science group listen in at this time.

ASTRONOMY—RADIO

Sunspots May Cause Delayed Radio Blackout

GIANT sunspot groups, such as that which caused the great aurora of Sept. 18, shoot out into space slow-moving charged particles of about 1,200 miles per second velocity as well as speedier particles. New evidence for this theory has come from observations made by Dr. Harlan T. Stetson of the Massachusetts Institute of Technology suburban laboratory in Needham, Mass., which showed a lag of about a day between sunspot effects upon short-wave transmissions and broadcast bands.

An abrupt drop in the field intensity of the National Bureau of Standards 5 megacycle transmission of standard frequency signals over WWV from Washington was observed at the same time that the aurora appeared.

Dr. Stetson also measures regularly the field strength of Station WBBM, Chicago. It was the next night before these transmissions were affected. They then practically disappeared.

Relatively speedy particles from the sun had an effect on the F ionized layer the first night and the slower particles a day later changed the E layer or the Kennelly-Heaviside layer. These layers in the upper atmosphere act as mirrors to reflect the radio waves and thus allow them to reach great distances by going from earth to layer and from layer to earth repeatedly.

The way in which the radio waves acted as the result of the largest sunspot group since the sunspot maximum in 1937 bears out Dr. Stetson's investigations over the past ten years. The delayed effect on the E layer upholds the theories of Chapman and Grotrian that there are the slow-moving particles, although it may also mean that time is required to build up an excessive degree of ionization at the E layer level to kill the transmission of radio waves at broadcast frequencies.

The fact that the big aurora display of September came close to the equinox has some significance to Dr. Stetson. The Easter disturbance of 1940 also came at the time of an equinox. There is good physical reason why this should be so. At the equinox the axis of the earth is perpendicular to the line joining the sun and the earth and the sun's pole is tipped towards the earth. Thus at this time any sunspot is more nearly in line with the sun-earth direction than would be the case at other times of the year.

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