CURIOUS KNOT FORMATION.

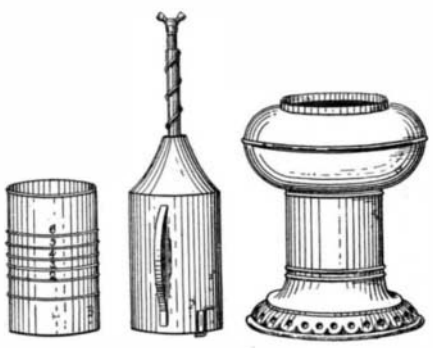
We are indebted to one of our correspondents, Mr. R. C. Wagner, of Jonesboro, Ind., for the accompanying illustration of a very curious knot formation. It was obtained from a swampy ash tree and was sawn off from the tree about 20 feet from the ground. The remarkable thing about it is its resemblance to the

CURIOUS KNOT FORMATION.

head of an aged woman, the various rings forming the receding planes which simulate the eye sockets and the mouth. The wood which forms the right eyeball is loose and can be moved around like a human eye. The knot is about as large as the average human head. The negative was not retouched. This curious specimen is now in the possession of Mr. B. Coleman, of Jonesboro.

A SIMPLE PORTABLE ACETYLENE HOUSE-LAMP.

The general public having convinced itself that calcium carbide is no more dangerous than kerosene and gasoline and that the brilliant white light of acetylene is far preferable to the weak, yellow flame of oil, it is



THE THREE PARTS OF THE LAMP.

not astonishing to find that acetylene is no longer restricted to the carriage and bicycle lamp, but is now used even in the house-lamp. The simplest lamp of this kind which has been brought to our attention, and perhaps the first produced by an American manufacturer, is made by the Badger Brass Company, of Kenosha, Wis.

AN ACETYLENE HOUSE-LAMP.

The lamp in question, as our illustration shows, consists only of three parts, a carbide-holder, a gas-chamber, and a lamp-base which serves as a water-reservoir. The carbide-holder is merely a cylindrical vessel, through the bottom and along the inner wall of which vertical feed-tubes extend. The holder is graduated, so that it can be readily determined how much carbide must be employed to yield a light for a time which may vary from two to six hours. The gas-chamber is a cylindrical vessel provided with a conical top through which a burner-tube extends, and is of such size that it can snugly receive the carbide-holder, the two sections telescoping with each other. On the sides of the gas-chamber springs are secured, which serve the purpose of engaging the wall of the water-reservoir so as to center the gas-chamber. The burner-tube is provided with a spiral rib which serves as a thread and co-acts with the shade-holder, to raise and lower the gas-chamber and water-reservoir.

When the water-reservoir has been filled, when the carbide holder has received its charge and has been thrust into the gas-chamber, and when the gas-chamber and carbide-holder, thus combined, have been slipped into the water-reservoir, the lamp is ready for use. By turning the shade-holder, which engages the rib or thread of the burner-tube, the gas-chamber and carbide-holder are lowered, whereby the water is forced up through the feed-tubes of the carbide-holder to the carbide. The water in the reservoir serves the double purpose of generating gas and of keeping the lamp cool. In order to extinguish the light, the shade holder is turned so that the carbide-holder and gas-chamber are raised. The water-level and pressure being thus reduced, the generation of gas ceases. It is therefore evident that the light can be as readily controlled as in any oil-lamp.

NEW TELEPHONE METER.

A successful telephone meter solves one of the most important problems connected with the telephone exchange. Where the service is measured or graded according to the number of calls, and where there are pay stations, the keeping of a record of these calls entails considerable labor upon the operators and distracts their attention from their other duties. In general, telephone meters may be divided into three classes: first, where they are located at the subscriber's end of the line only, and where they are controlled or supervised by the central office operator; second, where the meter is located in the central office and worked manually by the operator or automatically; and in the third class there are duplicate registers at the subscriber's station actuated simultaneously by the aid of the subscriber or operator.

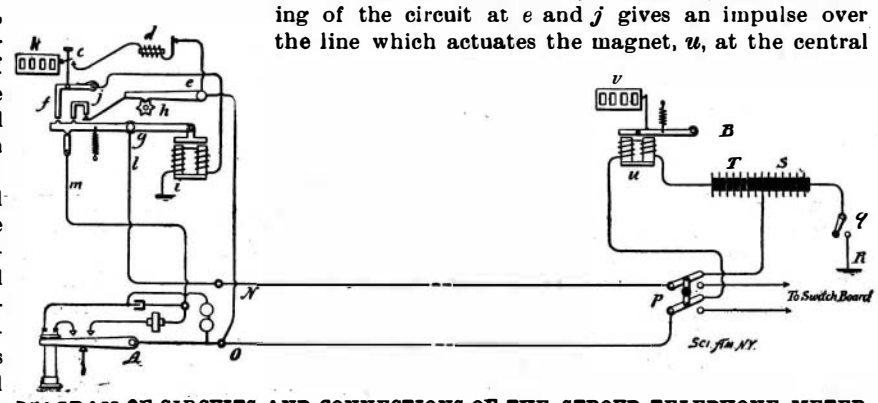


DIAGRAM OF CIRCUITS AND CONNECTIONS OF THE STROUD TELEPHONE METER.

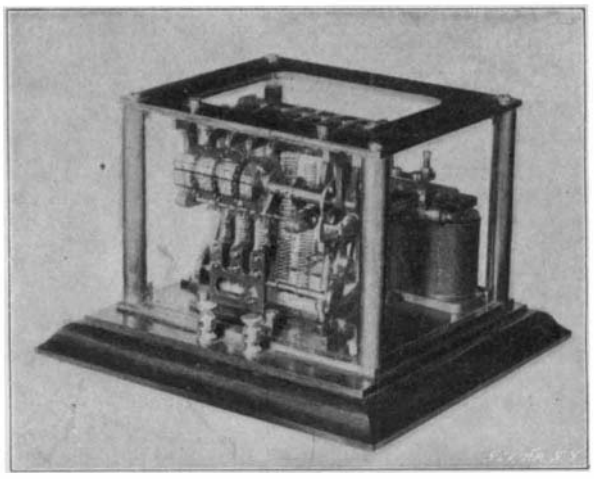
In meters of the first class, there is considerable expense and inconvenience in visiting the various telephone installations, in order to take the state of the meter. The second method is as unsatisfactory to the subscriber as is the ordinary system of keeping a record with a pencil, as the latter has no means of verifying his bill. This is also the disadvantage in the third system.

The Stroud telephone meter, which we illustrate, is made by the National Measured Service Company, of Chicago, and is designed to obviate these objections. In this system a permanent meter is not required at the switchboard for each line, one portable instrument doing all the work. It can be used with either the local or common-battery systems. Each outgoing call is "stored," as it were, at the instrument from which the call emanates, so that the operator need not be concerned as to who makes the call. At the end of any given time the registered number of calls can be transmitted electrically to the central station at the pleasure of the operator who is taking the state of the meters.

Our diagram shows the connections. Of the two other engravings, one illustrates the meter attached at a subscriber's station, and the other the recording instrument at the exchange.

In the diagram, *A* represents the register at the subscriber's end of the line, and *B* the counter with the battery connections, etc., at the central station. The meter is operated as follows: The subscriber at *A* removes the receiver from the hook, thus calling central; he then gives the number desired, to the operator. As soon as the person called responds, the operator asks the one calling to press the button, *c*, which must be done before the conversation begins. The operation of pressing the button sounds the buzzer, *d*, by closing the circuit from *O* through *f* by being brought into contact with *g* and thence to *N*. The same motion of the button, *c*, simultaneously rotates the counter one number forward and rotates the camwheel, *h*, to which is connected a spring, thus winding the spring and as it were "storing" the call.

At the end of any given length of time, when it is desired to take a reading from the meter, the operator who has charge of this branch of the service disconnects the line to be read at a convenient point in the central office and attaches the cords of the reading in-



THE REGISTERING INSTRUMENT AT THE EXCHANGE.

strument to the outgoing line, then rings the subscriber up and requests him to press the button, *c*, which closes the controlling circuit, *c*, through the coil, *l*, through *f* and *g* to *N* and thence to *p* and through the limb, *S*, of the battery and the switch, *q*, to the ground, completing the controlling circuit and energizing the magnet, *l*, which draws down its armature and closes together the contacts, *e* and *j*, also maintaining the connection made at *g* and *f* by the act of pressing the button. The energizing of the magnet, *l*, also releases pawls which check the spring connected with *h*, and the latter rotates backward, giving motion to the arm, *e*, which intermittently closes the circuit to *j*. The number of strokes of the arm, *g*, represents the number of calls stored by the meter; thus the closing of the circuit at *e* and *j* gives an impulse over the line which actuates the magnet, *u*, at the central station, so that the calls have been transferred from the subscriber's meter to the recording and reading instrument at the central office. After each reading the counter, *v*, on the reading instrument is restored to zero by turning a button. The counter at the subscriber's end of the line does not reset, but continues to count up to 99,999 and then turns to zero, so that it is possible for the subscriber to see how many calls he has had in any given length of time, and also protects the company by maintaining a positive record, should any part of the apparatus fail in transmission or recording. The number on the receiving instrument after registering, added to the previous total, should tally with the number on the subscriber's meter. The device is a most ingenious one.

SUBSCRIBER'S TELEPHONE WITH METER ATTACHED.