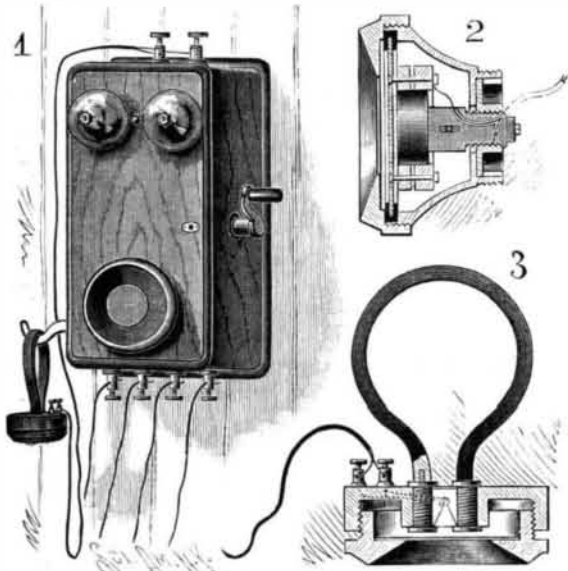


AN IMPROVED TELEPHONE.

The illustration represents a telephone designed to transmit a great volume of sound over long distances, and in which the transmitter is not liable to derangement. It has been patented by Mr. Eloy Noriega, box 516, city of Mexico, Mexico. The transmitter, shown in Fig. 2, has a diaphragm inclosed in an elastic band, annular carbon electrodes being placed upon screws passed through the diaphragm, one of these electrodes being movable upon the screws, while the other is fixed, and vibrates with the screws as they are moved back and forth by the diaphragm. A cylindrical carbon block is supported by a metallic stud to project loosely within the annular electrodes toward the diaphragm, the rear end of the stud having a threaded engagement with an insulating piece in the back of the diaphragm cell. One branch of a double conducting cord is connected with one of the screws through the diaphragm, and the other branch is connected with the stud. In the receiver, shown in Fig. 3, the mouthpiece has a laminated diaphragm formed of a number of thin sheets of iron. The poles of a polarized magnet are inserted in the diaphragm cell to within a short distance of the diaphragm, and the bobbins attached to the poles of the magnet are connected in series and their terminals connected with the binding posts projecting from the cell. Within the box, shown in Fig. 1, is a polarized vibrating bell of the usual description, and a magneto-electric machine for operating the call bells. In the cover of the box is an induction coil, the primary wire of which and the electrodes of the transmitter are in the circuit of the battery, one terminal of the secondary wire connecting through the hinge of the box with the ground wire, and the other terminal being connected electrically with one of the binding posts on the top of the box. In one side of the box is pivoted an angled lever forming a support for the receiver, the



NORIEGA'S TELEPHONE.

inner arm of the lever being connected with a spiral spring, electrically connected through a stud with one terminal of the induction coil, while in the path of the inner arm of the lever is a contact point, electrically connected with the transmitter. One terminal of the magnet of the polarized bell is connected with the ground wire and the other terminal is connected electrically with one terminal of the magneto machine, the remaining terminal of which is connected with the line wire. In using this telephone, sounds uttered in the mouthpiece of the transmitter, causing the diaphragm to vibrate, vary the contact of the annular carbon electrodes and the cylindrical electrode, and correspondingly vary the current in the circuit. The electrodes are made of binoxide of manganese, graphite, tar, sulphur, and water, formed in moulds and subjected to a strong pressure, the mass then being heated to a high temperature, in a manner similar to that followed in vulcanizing rubber.

The Famous Death Valley, Cal.

Several correspondents have called our attention to an error in the SCIENTIFIC AMERICAN of January 17, by which this desert region was located in Colorado instead of California. The name refers to one of several sections near each other, whose exact delimitations have not yet been marked upon the government maps, but which comprise some of the most unpromising lands to be found anywhere. What is known as Death Valley, and the Amargosa Desert and "sink" of the Amargosa River, are in Inyo and San Bernardino Counties, southeastern California, these desert regions also extending into Nevada, in the neighborhood of the Ralston, Mohave and Colorado deserts. For many hundreds of square miles there are only isolated farming spots, the valleys being mostly sandy desert wastes, generally terminating in an alkaline flat. According to the government survey of 1871, "the eastern slope of the Telescope Range makes an exceedingly abrupt descent of fully 10,000 feet into Death Valley, the area due east from Telescope Peak being

below sea level." The information which will be afforded by a complete survey of this region, such as is now on foot, will be looked for with much interest.

The Greatest of Copper Mines.

President Agassiz, of the Calumet and Hecla Mining Company, has made the statement that, in his opinion, the mine of which he is the chief officer can be continued in existence for a period of forty years at an annual production of about double its present output. At the end of that time it may be assumed that the supply of ore upon which it depends will have been exhausted. Looked at from the present standpoint, it may seem that an output of double the present volume would be a fair and ample average of the probable future production; but when one takes into account the enormous increase that has been made in the use of copper, and the probable extension of that increase, due not only to the growth in population, but the introduction of new electrical devices of all kinds, the estimate made by President Agassiz of what the future yield of his mine will be seems a low one. We are inclined to believe that unless great changes occur, the Calumet and Hecla mine in the year 1900 will be found producing three or four times as much copper as in the year 1890. This will of course cut down the possible life of the mine, assuming the correctness of President Agassiz's estimates, and thus although large returns will be paid in the interval, we should say that in twenty-five years from this time there would be very little life left in this great mining property. The Calumet and Hecla has paid \$34,500,000 in dividends.—*Boston Herald.*

The Electrical Treatment of Wine.

For some time past a small 8 horse power experimental plant, due to M. De Meritens, has been in operation at the Bercy works of MM. Pollet, where M. De Meritens' method of treating wine by electricity has been exhaustively tested and pronounced satisfactory by competent authorities. The dynamo employed is a 25 volt alternator, having a frequency of 116. The wine to be treated by electricity with a view of increasing its "keeping" qualities is passed through a small tube containing a series of silver disks connected to the poles of the alternator. The wine as it flows through the tube is thus traversed by a rapidly alternating current, which it is supposed destroys the ferments. The experimental plant is capable of treating 22 gallons of wine per hour. The process has been tried on wines of all kinds, and the results have been most marked with the light Algerian wines, whose bad "keeping" qualities have hitherto prevented their exportation.

Locks Used on United States Mail Pouches.

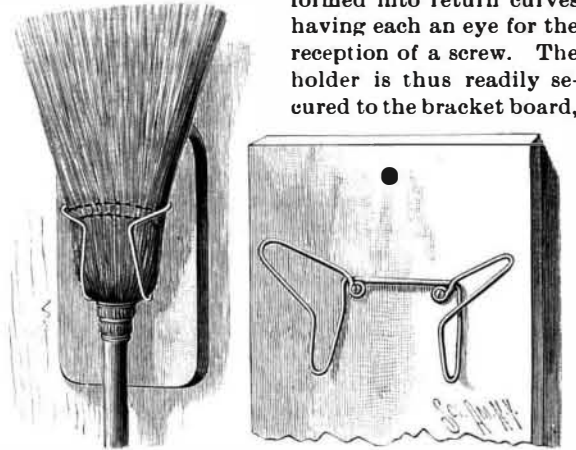
"It is a very risky thing nowadays for a mail agent to interfere with the lock on the mail pouches in his care," said Assistant Postmaster Gayler to a *World* reporter, as he handled a burnished copper lock which lay upon his desk. "This lock makes it practically impossible for any interference to go undiscovered. Examine this lock, and you will see that each time you turn the key, the register moves up one number. I lock it on the number 1,234. Now you unlock it. See, the number is now 1,235. And you cannot get it back to the first number, do what you may. All our locks begin at 1 and stop at 9,999, giving them a life of service of thirty-three years. When the last number is reached the lock will not work any more unless it is sent back to the factory and 'upset.' This fact was unknown to the route agent who ran between Altoona and Harrisburg in 1881, when the lock was first adopted by the government. He had no difficulty in procuring a key to open the lock, and figured that he could manage to go through the contents of his pouch, and by the use of a turning lathe, which he took in the car with him, he could soon send the numbers flying till he would get back to the number charged against him on leaving the post office at Harrisburg. It was mail lock No. 102, registered out on No. 23. After going through the contents of the pouch and getting a good swag he placed his lock in the lathe and commenced to turn. It didn't take very long to make 9,000 revolutions on the lathe, but when the lock refused to go past 9,999 the fellow got frightened and, throwing his booty down on the floor of the car, he jumped off and took to the woods. This was a warning to others, and we scarcely ever hear of any attempts to tackle this lock. It is the best kind of a protection against so-called honest fellows who don't mind stealing a few hundred if they risk nothing—fellows who are in positions of trust. It simply keeps watch, and if one of the men acts dishonestly, it just tells on him. That's all. But it tells every time and can't be bribed."

A Huge Gold Nugget.

At a recent meeting of the Geological Society, London, a model of the largest gold nugget yet found in Western Australia, known as the "Little Hero," weighing 330 oz. 8 dwt., found at Shaw's Fall, 200 miles from Roebourne and 80 from Nullagine, at a depth of eight inches, was exhibited by Mr. Harry Page Woodward, F.G.S.

AN INEXPENSIVE BROOM HOLDER.

A simple form of broom holder, which may be readily moved from one place to another, and hung upon a vertical support where desired, is shown in the illustration, and has been patented by Mr. J. H. Allison, of New Vienna, Ohio. It is preferably formed of a single piece of galvanized wire, or wire coated with any suitable non-oxidizable material, bent to form supporting limbs wherein the head of the broom may be seated, the middle portion of the piece of wire resting upon the face of a bracket board, while its end portions are



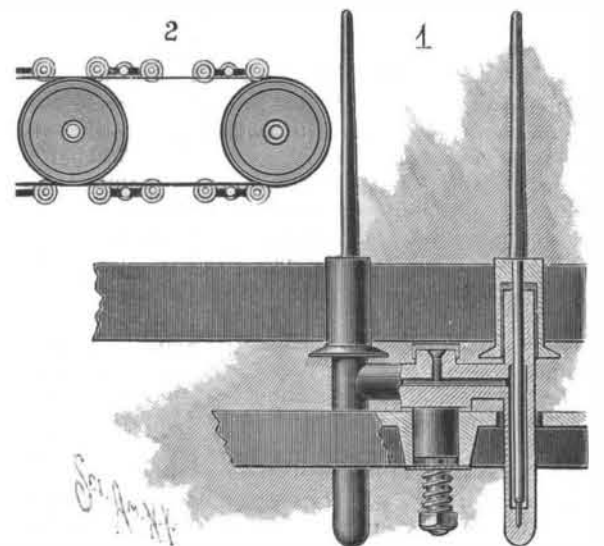
ALLISON'S BROOM HOLDER.

formed into return curves having each an eye for the reception of a screw. The holder is thus readily secured to the bracket board,

a hole in which permits the board to be readily hung upon a screw or nail in the wall.

A SPINDLE SUPPORT AND DRIVING DEVICE.

According to the device shown in the illustration the spindles are supported to be conveniently operated by a belt traveling across the frame of the machine, means being provided for maintaining a uniform tension on the bolsters and spindles. It is a patented invention of Mr. Joseph Duffy, No. 48 Wayne Avenue, Paterson, N. J. Figure 2 is a partial plan view, showing how the bolsters and spindles are mounted with reference to the belt, and Figure 1 is a broken vertical section, showing the construction of the bolster and the spindles mounted in it. The bolster has a horizontal body portion, with vertical arms at its outer ends in which are mounted the spindles, the extreme lower ends of the spindles being formed into pivots resting in sockets in the bolster arms. Fixed centrally to the under side of the bolster is a depending trunnion, turning in suitable bearings in the rail of the spinning frame, a depending portion of the trunnion carrying a spiral spring pressing upward against the bearing to give the necessary tension to the bolster. Upon the upper side of the bolster is a boss, having a suitable cover, and with a vertical bore communicating through a horizontal bore with recesses in the vertical arms in which the spindles are mounted, whereby oil may be supplied to lubricate the lower bearings of the spindles. Fixed to the spindles are hollow whirls fitting over the upper ends of the vertical



DUFFY'S SPINDLE SUPPORT AND DRIVER.

arms of the bolster, the lower ends of the whirls having lateral flanges adapted to support a belt, by which the whirls and spindles are rotated. The spindles are so arranged in the frame that the belt will press firmly against the whirls, and motion will thence be transmitted to the spindles, the oscillating of the trunnion causing an even pressure to be brought upon both whirls of a bolster, thereby imparting the same speed to each spindle and the same twist to the yarns. This device is also designed to double the capacity of each pulley, as, by means of the oscillating bolster, each pulley drives eight spindles, each of which bears with an even pressure upon the belt, thereby imparting an even twist to all the yarns spun.