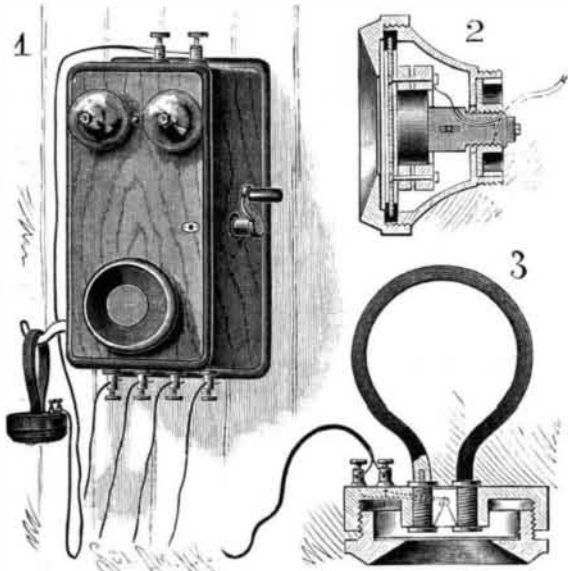


AN IMPROVED TELEPHONE.

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.

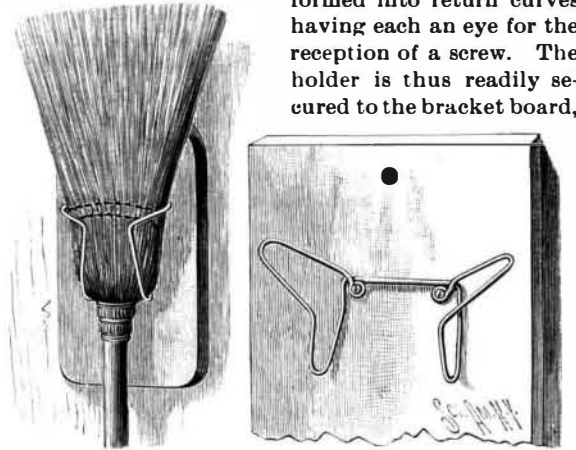
"It is a very risky thing nowadays for a mail agent to interfere with the lock on the mail pouches in his care," said Assistant Postmaster Gayler to a *World* reporter, as he handled a burnished copper lock which lay upon his desk. "This lock makes it practically impossible for any interference to go 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 formed into return curves having each an eye for the reception of a screw. The holder is thus readily secured to the bracket board,

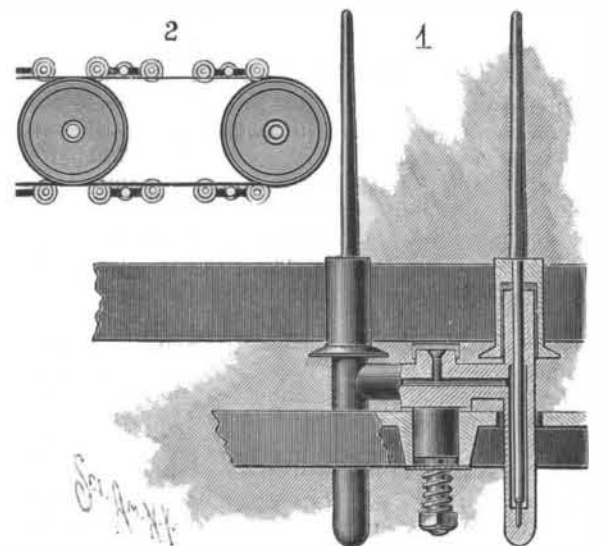


ALLISON'S BROOM HOLDER.

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.

The "Potato Cure."

Readers may remember the article which went the rounds of the various medical journals about a year ago, which highly extolled the virtues of potatoes as a remedy in cases where foreign bodies had been taken into the stomach. The explanation of this lay in the fact that the potato leaves a large residue in the intestine which passes on and increases the amount of feces to a considerable extent; the foreign body is enveloped in this, and any sharp corners or angles which it may possess are kept from injuring the delicate mucous membrane of the stomach and intestines. To accomplish this end large quantities of the vegetable must be eaten, and potatoes are given in every conceivable form, fluids being avoided as much as possible. The foreign body thus passes out without injury to the alimentary canal. At the time this remedy was brought to general notice several cases of recovery by its use were also noted. As the idea appears to be a very sensible one, we take occasion to abstract from the report of a case, remarkable in some respects, which was recently published in the *Medical Record*.

The case is reported by Dr. Edward Pisko, of New York, and is that of a child not quite one year old, who had swallowed a screw one inch in length. The screw passed on into the stomach, and did not seem to be giving much trouble when the patient was first seen. To avoid both a laparotomy and the danger of intestinal perforation, the aid of the potato was invoked, in spite of the tender age of the patient and the fact that it had just been weaned from the breast. Potatoes were given in every form, and white bread dipped in milk, but no fluids. The child continued well, and on the fifth day, after the administration of a slight laxative, the screw was passed enveloped in feces. There was no apparent injury to the stomach, and no intestinal catarrh, and the child's general health remained unaffected. The interesting features of the case are the brilliant success of a most unassuming remedy and the fact that the patient was so young, and scarcely weaned.

Pisko also relates the following case, which he saw in Albert's surgical clinic at Vienna:

A boy *æt.* 6 years, who, two years previously, had swallowed a nail, which at that time was removed by gastrotomy, was brought there again with a nail (6 centimeters long) in his stomach. This time the "potato cure," which had been introduced in the meantime, was used, with the result that on the ninth day the nail made its appearance *per vias naturales*.

It would seem that we are not yet acquainted with all the possibilities of the luscious tuber, since it even bears off the palm from laparotomy.—*Weekly Medical Review*.

Death Rates of the World's Largest Cities.

Following are the vital statistics for a number of the principal cities of the world, compiled to December, 1890:

AMERICAN.		
	Estimated Present Population.	Annual Death Rate per 1,000.
New York.....	1,655,598	22.22
Baltimore.....	455,427	19.31
Boston.....	446,507	23.64
Brooklyn.....	853,985	22.41
Chicago.....	1,100,000	16.93
District of Columbia (Washington).....	250,000
New Orleans.....	254,000	48.48
Philadelphia.....	1,064,277	18.97
San Francisco.....	300,000	20.23
St. Louis.....	460,000	15.02
FOREIGN.		
London.....	4,421,661	21.1
Liverpool.....	613,463	21.9
Birmingham.....	461,865	18.5
Manchester.....	379,437	27.2
Glasgow.....	530,208	22.4
Dublin.....	353,082	25.5
Copenhagen.....	307,000	20.7
Christiania.....	143,300	20.7
Stockholm.....	236,350	18.0
St. Petersburg.....	924,466	24.7
Amsterdam.....	403,083	19.2
Rotterdam.....	197,723	18.6
Antwerp.....	232,418	26.1
Brussels.....	182,275	25.7
Paris.....	2,260,945	24.61
Rome.....	393,496	23.9
Venice.....	156,515	31.5
Berlin.....	1,575,485	17.1
Munich.....	298,000	30.2
Prague.....	314,425	21.99
Vienna.....	822,176	23.0
Buda-Pesth.....	442,787
Bombay.....	773,196	19.78
Calcutta.....	433,219	21.5
Madras.....	398,777	35.0
Cairo.....	374,838	34.8

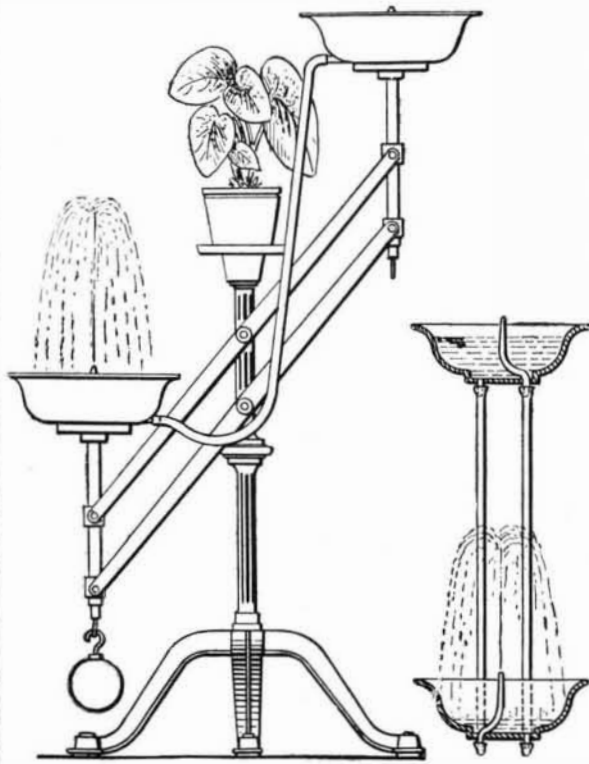
—*Fire and Water.*

Estimated Population for 1900.

The estimate of the population of the United States for the year 1900, by Hon. Carroll D. Wright, superintendent of the Department of Labor, gives as the approximate figures 76,639,854. This is the result of a careful consideration of the estimates made by several other reliable individuals, the known rates of increase, and the various circumstances that bear upon the growth of population.

PORTABLE PARLOR FOUNTAIN AND FLOWER STAND.

The annexed engraving, taken from the Vienna *Gewerbe Zeitung*, illustrates a fountain consisting principally of two equal sized basins, each containing a spraying nozzle and an outlet pipe, the spraying nozzles being connected by two rubber pipes with the outlet pipes, as plainly shown in the sectional view.



PORTABLE PARLOR FOUNTAIN AND FLOWER STAND.

The basins are supported on suitable holders connected with each other by parallel levers fulcrumed on the flower stand. A weight is adapted to be hung on the lower end of the holder containing the empty basin to counterbalance and to hold the filled basin in an uppermost position. The water flows from the filled upper basin through the outlet pipe to the spraying nozzle of the lower basin, and is projected quite a distance up into the air, to fall back and gradually fill the lower basin. When this is accomplished, the upper basin has run empty and the counterbalancing weight is now hung on the holder of the empty upper basin so as to change the position of the levers, and consequently the basins; that is, the filled basin assumes an uppermost position, while the empty one swings downward. The water now flows from the upper basin to



A CURIOUS TOMBSTONE.

the spraying nozzle of the lower empty basin, and is sprayed to accumulate in this basin.

It takes about one hour's time to empty a basin containing about one-half gallon of water, the opening of the spraying nozzle being one-half millimeter in size.

In case the water gets dirty, the basins can be readily removed from their holders and emptied, cleaned, and replaced, and one again filled with fresh water.

T. G. H.

Subterranean Fires.

Some idea of the terror of volcanoes may be gathered from an account of an eruption in one of the Hawaiian islands, as graphically described in the *London Budget*, when the crater was filled from five hundred to six hundred feet deep with molten lava, the immense weight of which broke through a subterranean passage of twenty-seven miles and reached the sea, forty miles distant, in two days, flowing for three weeks and heating the water twenty miles distant.

Rocks melted like wax in its path; forests crackled and blazed before its fervent heat; the works of man were to it but as a scroll in the flames.

Imagine Niagara's stream, above the brink of the falls, with its dashing, whirling, madly raging waters, hurrying on to their plunge, instantaneously converted into fire—a gory-hued river of fused minerals; volumes of hissing steam arising; smoke curling upward from ten thousand vents, which give utterance to many deep-toned mutterings and sullen, confined clamorings: gases detonating and shrieking as they burst from their hot prison house; the heavens lurid with flames; the atmosphere dark and oppressive; the horizon murky with vapors and gleaming with the reflected contest.

Such was the scene as the fiery cataract, leaping a precipice of fifty feet, poured its flood upon the ocean. The old line of coast, a mass of compact, indurated lava, whitened, cracked and fell. The waters recoiled and sent forth a tempest of spray; they foamed and lashed around and over the melted rock, they boiled with white heat, and the roar of the conflicting agencies grew fiercer and louder. The reports of the exploding gases were distinctly heard twenty-five miles distant, and were likened to a whole broadside of heavy artillery. Streaks of the intensest light glanced like lightning in all directions; the outskirts of the burning lava as it fell, cooled by the shock, were shivered into millions of fragments and scattered by the strong wind in sparkling showers far into the country. Six weeks later at the base of the hills the water continued scalding hot and sent forth clouds of steam at every wash of the waves.

A New Industry for Sunderland, England.

The negotiations which have been taking place for some time past between the River Wear commissioners and the Anglo-American Oil Company have at length been brought to a satisfactory conclusion, and, before long, a new and very extensive industry will be established in Sunderland. The Anglo-American Oil Company is one of the largest concerns in this country or America. It owns large oil wells in Pennsylvania, besides a fleet of specially constructed steamers for the conveyance of oil across the Atlantic. The company intends to erect works at Hendon, near Sunderland, covering about two acres of ground, which will comprise three or four tanks resembling gasometers in appearance, for the reception of the oil. The liquid will be pumped from their own ships, as they arrive in the docks, to the tanks referred to, and thence dispatched to all parts of the kingdom. This is an entirely new industry in the port of Sunderland, and capable of assuming large proportions.—*London Times*.

A CURIOUS TOMBSTONE.

The inhabitants of the sleepy village of Wilnetto, Ill., were astonished not very long ago to find an enormous elm tree standing in the middle of their principal street. It had been moved along the highroad, and was being conveyed to Graceland Cemetery, where it was to be planted over the grave of Mr. J. H. Lathrop, of Chicago. A rather romantic story is told about the reason for the transportation of so large a tree. It was said that while Mr. Lathrop and a friend were out shooting about two years ago, they stopped to take lunch under the spreading limbs of an enormous elm. They stood admiring the tree, and finally entered into a compact that upon the death of either, the tree was to be transplanted to the grave of the deceased at the expense of the survivor. Unfortunately, there is no reason to believe that there is any truth in the story, as Mr. Lathrop was not a sportsman. He knew the tree, took a fancy to it, and made up his mind that he would be buried under its branches. To that end he provided a fund of \$10,000 in his will for the removal of the tree from the forest where it stood to the cemetery, a distance of twelve miles. At the time when the photograph which we publish was taken, the tree had been moved five miles without accident, save the sad fate which met one of the laborers, who was crushed to death beneath it. A force of thirteen men is employed, and the expense of removal so far has been \$2,000.

A hole has been chiseled through the tree about ten feet from the ground, and through this has been passed a steel bar, which projects far enough on either side to bear upon the heavy timber braces which support the tree in an upright position. Wire guy ropes are attached to staples driven in the limbs which serve as a further support. The roots are carefully wrapped up to protect them from freezing. The tree is about 75 feet high and 7 feet in circumference.