

AN IMPROVED DENTAL PLUGGER.

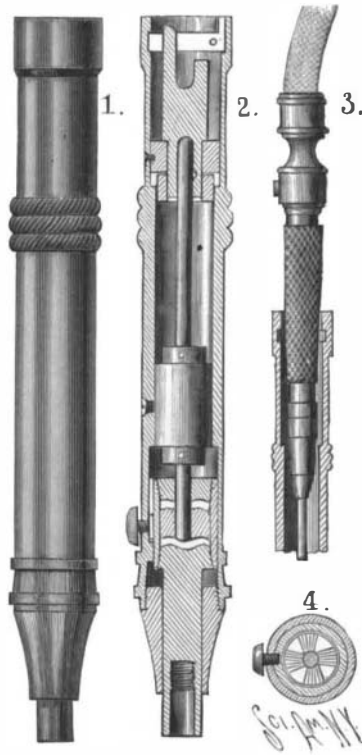
The illustration represents a dental tool which has a double action, being able to strike a number of blows with the point at one revolution of the driving shaft, and the point being brought into action either when its working surface is pressed against an object or when the point is pulled rearwardly. By its use, also, fillings of any shape may be perfectly placed and located in any desired position. The improvement has been patented by Ormond E. Wall, Honolulu, Hawaiian Islands. Figs. 1 and 2 are side and sectional views of the tool, Fig. 3 showing a portion of the plugger barrel, with a hand piece in position in its end. In the forward end of the barrel is screwed a plug, bored to receive the loosely sliding point chuck, having at its outer end a socket for the plugger point, while within the barrel, adjacent to the plug, is a sliding cylinder, longitudinally grooved to receive a projection preventing it from revolving on the pressing of an exterior button. The point socket has at its inner end a head screwed into the outer end of this cylinder, and in the opposite end of the cylinder is a plug, the inner face of which, and of the chuck head, have ratchet or undulating surfaces, as shown in the transverse view, Fig. 4, an intermediate revolving piston also having two similar undulating surfaces. The piston is secured to the end of a drive shaft turning loosely in a guide block, the shaft being rotated in various ways, and being shown in Fig. 2 adapted to receive a slip joint. An ordinary drill hand piece may, however, be employed, as shown in Fig. 3. In operation, the plugger point is screwed to the chuck, the ratchet teeth of which are, by pressing on the point, brought in contact with the ratchet teeth on the outer face of the rotating piston, the four ratchet teeth causing four blows to be struck at each revolution of the piston. For the back action, the cylinder is moved forward by pulling on the plugger point, when the teeth of its inner ratchet engage with the inner ratchet of the rotating piston, producing a similar series of back-acting blows. By pressing on the button to prevent the revolution of the cylinder, the operator is enabled to pick up gold, carry it to the cavity and place it in position, without the plugger making any blows and without stopping the machine.

BERLIN INDUSTRIAL EXPOSITION OF 1896.

The Berlin Industrial Exposition was opened on May 1, by Emperor William. This exposition is of enormous proportions and will be a great credit to the empire. Forty buildings have been erected for the purposes of the exposition in Treptow Park in the north of Berlin. The grounds used for exhibition purposes are larger than those of the Paris Exposition of 1889. The river

Spree, which is so narrow in the heart of the city, widens out at Treptow Park, really forming a small lake. This gives a chance for some fine effects of landscape gardening. The position of most of the buildings will be seen by referring to the engraving.

The main building covers a space of 53,000 square meters, and is intended to shelter the displays of most of the groups exhibiting in the exposition. Two tall



WALL'S DENTAL PLUGGER.

and slender towers and a grand aluminum cupola give this building a very striking and graceful appearance. A vast, crescent-shaped colonnade in front of this structure serves as a covered promenade ground, and contains, besides an elegant café, a number of institutions for the convenience of the visiting public, such as post and telegraph office, telephones, reading rooms and bureaus for the press, money brokers, information, etc.

The building for Chemistry, Mechanics, Optics and Photography (2) contains the exhibits of these groups, and also a lecture room for lectures on popular scientific subjects. The great Fisheries building, consist-

ing of two adjoining wings connected by a central structure, will harbor in its walls the groups of Food Products and Beverages (3) and the Fishery and Sport Exhibition (4).

The municipality of Berlin exhibits in a separate pavilion (5) the system of technical, industrial and mechanical schools now established in the capital of Germany. The building for Water and Gas (6) shows models and plans of conduits and gas fixtures of all sorts. The Alpine Panorama (7), with an inclined plane railway, presents a drastic and imposing picture of the Zillertal and its glaciers. Visitors will enjoy such a magnificent view from the Restaurant (8), situated on the banks of the Spree, that it will become deservedly a favorite resort. In the marine exhibition (9) large models of all sorts of shipping, men-of-war and merchantmen, will be displayed and maneuvers carried out in exact imitation of real naval exercises. The Giant Telescope referred to in our last issue (10) will prove a great attraction for scientists and the public in general. Old Berlin, with the Theater Old Berlin (11), a most artistic reconstruction of the old city, carries the visitor back centuries ago to that time when the present vast metropolis was but the capital of the Electorate of Brandenburg. The German Colonial Exhibit (12) will strive to give a faithful picture of the German Colonies, not only by exhibiting their natural products and manufactures, but also by displaying groups of the natives and by showing the mode of life they lead at home. The Grand Main Restaurant (13), situated as it is in the center of the grounds and on the choicest spot of the same, will doubtless prove a favorite resort for all visitors.

The progress made in educational matters up to date, as well as all improvements in sanitary and benevolent institutions, can be studied in the building (14) erected especially for those groups.

A most original and interesting spectacle of Oriental life will be presented to the visitor in "Cairo in Berlin" (15), a gorgeous but faithful imitation of the capital of Egypt with its streets and buildings. The Horticultural Exhibition (16) will be a beautiful and magnificent display of nature's most graceful products.

Gondolas and many pleasure boats of every style will enliven in an interesting and attractive manner the Grand Lake (17), constructed on a former popular playground, and this magnificent artificial basin of water, with the extensive avenues of fine old plantains that line its banks, will form a picture of beauty that visitors will never forget, while in strong contrast with this artificial body of water, still vying with it in beauty, is the old Carp Pond (18), with its green banks, its swans and waterfowl. It was the idyl of Treptow Park and will prove to be the idyl of the Exposition.



1. The Main Building. 2. Lecture Hall and Building for Scientific Industries. 3. Group for Food Products. 4. German National Exposition of Fisheries and Sports. 5. Pavilion of the Municipality of Berlin. 6. Pavilion for Water and Gas. 7. Alpine Panorama of the Zillertal. 8. Grand Restaurant on the River Spree. 9. Marine Spectacle. 10. Giant Telescope. 11. Theater Old Berlin and Old Berlin. 12. German Colonial Exhibition. 13. Main Restaurant. 14. Educational and Benevolent Institutions Exhibit. 15. Cairo. 16. Horticultural Exhibition. 17. The Grand Lake. 18. The Carp Pond.

BERLIN INDUSTRIAL EXPOSITION OF 1896.

Notice.

A premium of \$250 is offered by the **SCIENTIFIC AMERICAN** for the best essay on **THE PROGRESS OF INVENTION DURING THE PAST FIFTY YEARS.**

This paper should not exceed in length 2,500 words. The above-mentioned prize of \$250 will be awarded for the best essay, and the prize paper will be published in the Special 50th Anniversary Number of the **SCIENTIFIC AMERICAN** of July 25. A selection of the five next best papers will be published in subsequent issues of the **SCIENTIFIC AMERICAN SUPPLEMENT** at our regular rates of compensation.

The papers will be submitted for adjudication to a select jury of three, to be named hereafter.

Rejected MSS. will be returned when accompanied by a stamped and addressed envelope.

Each paper should be signed by a fictitious name, and a card bearing the true name and the fictitious name of the author should accompany each paper, but in a separate sealed envelope.

All papers should be received at this office on or before June 20, 1896, addressed to

Editor of the **SCIENTIFIC AMERICAN**,
361 Broadway, New York.

Correspondence.

Raising the Water Level of the Great Lakes.

To the Editor of the **SCIENTIFIC AMERICAN** :

Observations made here during the slow opening of navigation this season have thrown considerable light on the vexed question of maintaining the levels of the Great Lakes against the constant tendency of the water to decline and leave the harbors and river passages too shallow for the accommodation of the fleet.

This is doubtless the most serious problem that confronts the commerce of the lakes. In spite of the work done by the government in deepening the Detroit, St. Clair and St. Mary's Rivers to 20 feet, which work is now nearly finished, the decline of the levels of the lakes themselves is such that the work will prove to be practically valueless unless something is done to save the water in the lakes themselves. Buffalo harbor is as deep as any on the lakes, and still the grain fleet now arriving is scarcely able to stir unless the wind is favorable.

The decline of the level of Lake Erie from the government normal is now fully two feet and Niagara River is estimated to be 6 to 8 inches lower than it was last spring. While it is a matter of dispute whether the deepening of the passages affects the lake levels, the work is so necessary that investigation would produce no results nearly so valuable as the discovery of some means of holding the lakes themselves in place.

There is much speculation over the utility of dams at the mouth of this and other lakes, but the plan will hardly be tried till something arises to make it appear feasible. The advocates of dams have feared to ask an appropriation of Congress for the purpose of experimenting, especially when so many other improvements are wanted, but would welcome anything tending to show that dams would prove effective. It appears that the evidence is now to be had.

The first vessel left Buffalo this season on April 20. There was at the time about 80 miles of ice to pass through before reaching open water. This ice disappears mainly through the action of the sun, but during the week, or perhaps fortnight, taken for it to disappear, large masses of it become detached and pass down the river. Naturally, this ice occasionally strikes the rocks at the head of the river, as the water is shallow, where it forms an imperfect dam. For some time the vessel men in the harbor, which is on the lake level, noticed that the depth of water was subject to sudden variations. An observation of the water line on the docks would show a rise or a fall of a foot or more in an hour or so.

These changes were carefully observed now for the first time, as there was so much more dependent on the depth of water than usual at this time of year. Most of the incoming grain fleet could not be moved about the harbor unless the water was at its highest, while usually they have come and gone at any stage of the water. The water level is materially affected by the wind, but there were changes of level that took place with no corresponding change of the wind, and it was at length found that whenever the ice field escaping into the river was caught on the shoal at the head of it the water rapidly rose and the vessels aground inside could be released.

The main point of the showing seems to be the effectiveness of so frail and irregular a barrier as that formed by the ice, and, after that, the rapid rise of the water. But for the destructive force of storms and the flow of ice in spring, the showing is sufficient to prove that the dumping of ordinary stones, such as are constantly obtained from marine rock blasting, would be sufficient to solve the problem; and it is quite possible that in any case these loose stones would remain several years without any cement or anchorage to

hold them, especially as in former years the silt from the harbor was dumped on the same shallows, where it remained for the most part till carried away by the ice of the following spring.

The conclusion to be reached from this action of the ice cannot be less than this: That the proposed dams need not be nearly as complete and expensive as was supposed and that they will produce the desired result.

Buffalo, N. Y.

Premature Burial.

To the Editor of the **SCIENTIFIC AMERICAN** :

The interesting paragraph in the **SCIENTIFIC AMERICAN** of March 21, on "The Progress of Cremation," induces me to offer a few observations upon the above mentioned subject. In addition to the sanitary advantages which the practice of cremation possesses over other forms of the disposal of the dead, is that of the prevention of premature burial. The regulations of the British Crematorium at Woking, Manchester, and Glasgow, require that, previous to cremation, the body shall be examined by one independent medical practitioner, in addition to the doctor attending, and the examiners are obliged to certify to the fact, as well as the cause, of death. In ordinary cases a cursory and perfunctory inspection of the face of the corpse is all that is usually made, and when it is remembered how difficult it is in cases of trance, catalepsy, and suspended animation to distinguish apparent from real death, and that not a few persons (according to the evidence of those who have looked into the facts) have been buried alive, any system that will minimize this terrible risk will be welcomed by the reflective portion of every community. Alluding to the difficulty of discriminating between real and apparent death, Dr. Franz Hartmann, in his work, "Premature Burial" (the English edition of "Buried Alive," published at Boston, Mass.), observes :

"Apparent death is a state that resembles real death so closely that even the most experienced persons believe such a person to be really dead. In many cases, not even the most experienced physician, coroner, or undertaker can distinguish a case of apparent death from real death, neither by external examination nor by means of the stethoscope, nor by any of the various tests which have been proposed by this or that writer, for all those tests have proved to be fallible, and it is now useless to discuss them at length, because the medical profession has already agreed that there is no certain sign that a person is really and not apparently dead except the beginning of a certain stage of putrefaction. All other tests ought to be set down as delusive and unreliable. Mrs. Schmidt, a young woman of Kempen, died of cholera, and was put into a coffin in which she remained for seventy-two hours. Two doctors, Dr. Junker and Dr. Leon, certified to her death. At the hour appointed for her burial, her husband arrived and found the corpse of a blue black color. Believing that it would be dangerous to his life to handle the corpse, he postponed the burial to following day. On the next morning he approached the body and imagined that he found signs of life in it. He, therefore, went to the physician and informed him of it, but the doctor laughed at his credulity, telling him, however, to rub the body with vinegar. This was accordingly done, and, after an hour, the lady returned to life, and recovered entirely within a few days."

This is only one of several hundreds of authenticated cases collected by Dr. Hartmann, the details of many of which are too painful for presentation to your readers. The subject needs thorough ventilation, and the existing mode of examining the dead in America and England requires drastic reform. This may be brought about or helped forward by the attention now being directed to the public health and the public safety in respect to the establishment of crematoriums in every large center of population. **JAMES R. WILLIAMSON.**

London, N. W., England.

Use of Descriptive Trade Name.

A question of much interest was decided by the English House of Lords recently in the case of Reddaway et al. vs. Banham. It appeared that the appellants had been making belting of camel hair for some time, and had stamped the words camel hair belting upon their goods, together with a camel as a trade mark. The respondent, a former employe of the appellants, made similar belting, and sold it with the words "camel hair belting" stamped upon it. In the trial court the jury found that the phrase meant among the people that bought the goods belting made by the appellants, and no one else, and that the respondent had tried to pass off his goods as those made by the appellants. A judgment in favor of the respondents was reversed by the court of appeal on the ground that the belting made by the respondent might be fairly described as camel hair belting, and that he was entitled to use these words. The House of Lords, however, reversed the decision of the court of appeal, on the ground that while, as a rule, no man can claim a monopoly in a merely descriptive title of

his goods, yet if the facts show that by the use of this title a trade rival is selling goods as if they were the goods of another, a case is made out for the interference of the courts.

Science Notes.

A marble bust to the memory of the philosopher Luigi Ferri was erected on March 16 in the hall of the University of Rome.

A balloon sent up from Paris, recently, attained the height of 15,000 meters, or 9½ miles, before it came down near Cambrai.

X rays are to be applied to practical agriculture. Dr. Graetz, of Munich, has taken a picture of a one-day-old pig, showing its bony structure. By continuing to make pictures of the pig the action of food on its growth will be shown.

The French government has decided to continue the pension of 25,000 francs to Louis Pasteur's widow.

Doctors D'Arsonval and Charrin, of Paris, have been taking the temperature of our internal organs. They find that it is highest in the normal liver, which is one degree Centigrade hotter than the intestine; then follow in a decreasing ratio the spleen, the heart, the kidney, the marrow, the brain, the muscles, and the skin.

The National Academy of Sciences, acting on the request of the Secretary of the Interior of the United States, has reported a commission to investigate the forestry problem, consisting of Charles S. Sargeant, Alexander Agassiz, Henry L. Abbot, William H. Brener, Arnold Hague, and Gifford Pinchot. The secretary will recommend to Congress an appropriation of \$25,000 to cover the expenses of the commission.

The dragon flies are the champions on fast flying. M. Marey, the French scientific photographer, found that in order to photograph one of the creatures on the wing he had to make the exposure only $\frac{1}{1000}$ part of a second.

M. Berthelot, the celebrated French chemist, has resigned from the Ministry of Foreign Affairs of France.

James Stirling says: "A valuable ally of the field geologist is to be found in the land crab. The work performed by this diminutive excavator in bringing up pieces of the rock forming the subsoil helped the miner to find coal seams in South Gippsland, just as the burrowing wombat had disclosed a stanniferous lode in the Australian Alps. From similar evidence officers of geological surveys have traced outcrops in places where the rock was masked by alluvium."

The statement is interesting as coming from Prof. William Huggins, foremost in such researches, that beyond the violet end of the spectrum there is a whole gamut of invisible rays which only reveal themselves by their effect in promoting chemical action, and similarly, beyond the other end of the visible scale, the deep red, there is a gamut of invisible or dark rays which are only perceived by their heating effects. Some idea, he says, of the importance of the "ultra red" may be gathered from the fact that it has been traced to a distance nearly ten times as long as the whole range of the visible or light-giving region of the spectrum; to learn, then, the character of these mysterious dark rays, it has been clearly necessary for science to fit itself with some new sort of eyes for seeing what ordinary eyes cannot, namely, heat rays and chemical rays, and, in respect of the latter, the photographic plate has brought out some wonderful facts, while the bolometer has been used in feeling for absorption lines in the great invisible spectrum which lies beyond the red.

Ten thousand people visited the South Kensington and Bethnal Green Museums in London on the first Sunday on which they were thrown open. Only ten attendants and thirty-four policemen had to work on Sunday.

The nomination of John J. Brice, of California, for Commissioner of Fish and Fisheries has been confirmed by the Senate.

Descartes' tercentenary will be observed by the publication of a complete edition of his works, by authority of the French government.

The new Royal Observatory at Edinburgh has been formally opened. The observatory contains a 15 inch refracting telescope and a 24 inch reflecting telescope. Among other instruments in the building is the great Dun Echt electromagnet. A clock at the observatory is connected by telegraph with Greenwich.

The steam yacht Blencathra will carry an excursion to the Arctic regions next summer, says Science. The yacht will visit Iceland, Greenland and Hudson's Bay.

The expedition of the Russian Geographical Society, equipped for the exploration of the Irkutsk region of Siberia, has started and will be absent for three years.

The idea of the numbering of the heavenly bodies, whether planets, satellites or stars of the smallest size, was formed at the Astronomical Congress in 1887, and already 189 photographs have been taken with a view to the publication of an international catalogue. Some of these photographs only contain a dozen stars, but others are crowded even to the number of 1,500. It is expected that the catalogue will enumerate about 3,000,000 stars.