

FRYER'S DESTRUCTOR AND CARBONIZER.

[Continued from first page.]

ties of materials were consumed in the destructor: 14,000 tons of rubbish, 59 beds, 131 mattresses, 264 carcasses of pigs which had suffered from swine fever, 1 cow, 8 sheep, 2 lambs, 28 quarters of bad meat, 13 cwt. of bad meat.

The total quantity of rubbish consumed in 2½ years in the Burmantofts destructor was 30,041 tons.

For each depot the following men are required: One foreman, who also acts as engine-driver; four furnacemen, one laborer, who also attends to two mortar mills; and the same for night duty.

The carbonizer is used to convert the refuse obtained from the sweepings of the paved streets and the markets, and other vegetable refuse, into a carbon very useful as a manure and deodorizer, and which finds a sale at the rate of 30s. per ton.

The carbonizer consists of a group of brickwork cells and furnaces, each cell having its own distinct furnace alongside of it. It is 26 feet long, 12 feet wide, and 15 feet 6 inches high, tied together with iron rods and angle-irons.

The refuse to be carbonized is fed into the apparatus at the top, the loose cover of the cell being removed for that purpose and immediately replaced; within the brickwork cells are hung, by means of cast iron plates fixed in its walls, a series of cast iron plates or eaves, touching the walls along their top edges, but standing free from the walls some inches along their lower edges. These plates are arranged to overlap one another, and form a continuous sloping ledge or eave, winding round and round the cell in a kind of spiral. Near the bottom of the cell the spiral eave finishes with a fire-block eave, the lower edge of which rests on a wall dividing the contents of the cell on one side from the hot gases of the fire which are admitted to it on the other side.

The refuse is fed into the cell until it forms a solid mass within the well of the spiral eave, being withdrawn at the bottom as it gets sufficiently charred, but it is not mobile enough in its nature to rise up again either underneath or behind the eaves, so that a space is there left forming a continuous flue in connection with the chamber behind the fire-block at the bottom of the cell, and up this flue pass the hot gases from the fire, heating the contents of the cell. At the top of the cell these gases pass through the damper frame into the vertical flue, and so into the main flue and thence to the chimney. The process undergone by the refuse is as follows: After being thrown in at the top of the cell it sinks gradually as it becomes closer packed, and as the finished charcoal is withdrawn at the bottom it sinks, and continually comes in contact with hotter and still hotter plates, until at the bottom of the cell it enters a chamber of nearly redhot firebrick.

No air is admitted during the process, except a slight amount which reaches it from the flue behind the eaves, so that instead of being consumed it is charred. The cell terminates about 2 feet from the ground in a strong cast iron plate, in which is an opening closed on the underside by a sliding door; this is opened at certain intervals (about three hours) by letting out a charge of charcoal into a small truck which is run in below the plate ready to receive it. The furnace with firegrate and door is of ordinary construction, and within it a thick, dull fire is kept up. Sight or peep boxes are provided to enable the flues nearest the fire to be cleansed, and similar peep boxes higher up allow a view on to the backs of certain of the cast iron plates for the purpose of seeing that they do not become overheated.

Though the cast iron plates are bolted to the walls, or through the walls to one another, they are removable if need be without pulling down any of the brickwork.

The charcoal, which comes out of the carbonizer redhot, is cooled in a char cooler, by passing through a revolving cylinder, over which cold water is continuously streaming, and is sifted as it issues from the outer end. This cooler is also driven by the steam engine which works the mortar pans.

Each cell deals with about 50 cwt. of refuse in every twenty-four hours, and the fuel required for the furnaces is sifted from the contents of the dry ashpits, it not being necessary to purchase any.

The cost of an establishment with one six-celled destructor, a carbonizer with eight cells, boiler, steam engine, two mortar pans, cooler, chimney shaft, and buildings, is about £4 500.

No nuisance of any kind is experienced in the vicinity of the depots, and this system of dealing with the refuse of towns appears to be gaining ground; the apparatus has been adopted in Kralingen, near Rotterdam, Leeds, Heckmondwike, Blackburn, Bradford, Warrington, and Derby, and is, I hear, about to be adopted in Bolton, Dewsbury, and Roth-erham.

Prize from the Belgian King.

In December, 1874, the King of the Belgians offered a yearly prize of 25,000 francs "for the encouragement of intellectual effort." The prize for the year 1881, which is open to the competition of citizens of all nations, will be awarded to "the best work on the means of improving ports established on low and sandy coasts, like those of Belgium." The conditions of the competition and award are as follows: 1. Foreigners desiring to compete will be required to send their works, either printed or in manuscript, to the Minister of the Interior at Brussels before March 31, 1881. 2. A manuscript work obtaining the prize must be published in the course of the year following that in which the prize shall have been awarded. 3. The award will be made by a jury appointed

by His Majesty the King of the Belgians. The jury will be composed of seven members, three of whom are to be Belgians, and four foreigners of different nationalities. General Eaton, Commissioner of Education, in a circular calling the attention of American scientists, engineers, and educators to the subject, says: "Competitors in the United States are advised that they should forward their articles through the Department of State."

RECORDING TELEPHONIC RECEIVER.

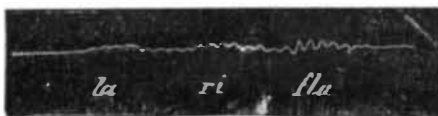
Doctor Boudet has published a very interesting volume upon the application of the telephone and microphone to physiological and clinical uses. The book is made up entirely of details of the researches and experiments which he has made in his laboratory.

We extract some passages relative to the electrical recording of speech.

The automatic recording of telephonic messages is the first step towards the solution of a problem which has been declared insoluble. In order to arrive at a result which so many scientists have considered paradoxical, Dr. Boudet modified the telephone receiver in the following manner: Removing the diaphragm of the Bell telephone, he screwed



to the wood one end of a steel spring, the other end being opposite the pole of the magnet. To the free end he soldered a small piece of soft iron weighing a tenth of a gramme. Attached to this piece and in the prolongation of the axis of the spring he fixed a light bamboo arm ten centimeters long and terminated by a needle of whalebone. In fact the diaphragm is replaced by a movable armature resembling the interrupter of an induction coil. By means of this instrument, the tracings shown in the annexed engravings were obtained. These tracings were made upon smoked

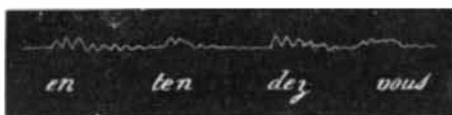


paper, and transferred to glass to be studied with a microscope.

As will be seen in the examples given, there are some remarkable points of difference between the several tracings as well as some points of resemblance, which make it probable that tracings of this character may be deciphered. These tracings, though far from being perfect, seem to contain the germs of success.



Dr. Boudet has made practical use of some of these experiments. He expects to enable deaf mutes to hear singing by means of a microphone, in cases where the auditory nerve is not entirely lacking, but where some defect in organization renders speech impossible.



The musical sounds are inscribed upon a smoked cylinder, which permits of the comparison of the visual record with the audible sounds which have been heard. It remains to be seen whether the reversal of this process will reproduce the voice as in the phonograph.

Cultivation of and Trade in Peanuts.

The trade in peanuts, already large, is annually increasing. Because the unreflecting public sees it mostly as conducted by petty retailers on stands at street corners, it is generally inferred that the peanuts are at best an unimportant article of commerce, but this, as is usually the case with conclusions derived from superficial observations, is erroneous. The trade extends in a similar way to not only all our large cities, but also to inferior towns and villages.

The *Confectioner's Journal* has compiled some statistics of the trade which are worthy of attention. By those who have entertained false impressions regarding the value of this crop it will scarcely be credited that it amounted last year to 2,220,000 bushels, which, at prices realized to first hands, reaches an aggregate of \$2,150,000. The crop is principally raised in Virginia, which last year produced 60 per cent of the entire consumption. The crop is generally harvested in October, beginning a little earlier in Virginia. Tennessee produces about 35 per cent of the crop annually sold, and North Carolina about 5 per cent. Peanuts are elsewhere raised for home consumption, the amount so produced being difficult to estimate. "The nuts marketed in New

York and hereabouts come chiefly from Virginia, while those from other Southern States find a market in the West. When peanuts are scarce and high, the African nut is imported, but with the present supply and low prices, foreign nuts have no place in the market. Peanuts are sold by dry measure by jobbers, but retailers sell by wine measure, making forty quarts to the bushel.

RECENT DECISIONS RELATING TO PATENTS.
Supreme Court of the United States.

FLETCHER, APPELLANT, vs. BLAKE.

Mr. Justice Harlan delivered the opinion of the court. This is an appeal from a decree in the Circuit Court of the United States for the Southern District of New York, dismissing a bill in equity based upon an alleged infringement of letters patent issued to the plaintiff in error on the 8th of June, 1869, for an improvement in stamps used for revenue and other purposes.

Held:—An invention consisting of a postage or revenue stamp having a portion of its surface composed of thin fragile paper or other suitable material loosely attached, and on which a portion of the design or other matter is printed, is not infringed by a stamp composed of one continuous piece of paper, of uniform thickness, upon the face of which is certain printed or engraved matter, with blank spaces, in which are inserted, at the appropriate time, certain figures and names required by law to appear upon revenue stamps, which blank spaces are prevented from adhering to the barrel by the interposition of a red slip of blank paper attached to the back and outside edges of the stamp.

Decree of Circuit Court sustained.

United States Circuit Court.—Southern District of New York.

BUCHAN *et al.* vs. MCKESSON *et al.* SAME vs. HENRY *et al.*—
PATENT CARBOLIC ACID SOAP.

Blatchford, J.:

1. The first claim of reissued patent No. 5,007, to Isabella Eames and Charles A. Seely, July 30, 1872, being a claim for "a soap made by incorporating carbolic acid, or its equivalent, with ordinary soap, substantially as specified," Held to be anticipated by the English patent of Alexander McDougall, No. 2,510, of October 15, 1860, for "improvement in materials or composition for destroying vermin on sheep and other animals, and for protecting them therefrom."

2. If McDougall, by using with a fat and an alkali a crude carbolic acid or creosote which did not contain carbolic acid or cresylic acid as pure or as concentrated as it was afterward made, produced a true soap developing the properties of the acids referred to, there was no invention in subsequently using the purer article. The advance was only one of degree.

3. Although soaps made with the finer carbolic acid existing at the date of plaintiffs' patent may be applicable to purposes to which soaps made with the less pure carbolic acid could not be applied, that shows only a difference in degree and not invention.

4. The effect of an earlier invention upon the claim of a patent not avoided by a specific disclaimer in the specification when it appears that such disclaimer is based upon an unsound view of the invention to which it relates.

Malleable Castings.

Considerable pretense of mystery is assumed by manufacturers of malleable castings both in this and the old country, and doubtless there are some trade secrets of value to those in the trade relative to mixtures of different irons, etc., but the process is in itself simple, and a little experience should enable any foundryman to attain a creditable success in it. Nearly every foundry has his own mixtures and methods, but they are all based upon the processes of Samuel Lucas, of Dronfield, which date back to 1811. The general features of the process, as carried out by the Birmingham (England) iron founders, is given in the *Ironmonger*, as follows:

"For the purpose of the casting pig of a fine quality is needed, and great care is used in the preparation of the moulds, so that there may be no flaw or imperfection in the casting. The latter, after cooling, is, of course, hard and brittle, and it is to remove this brittleness and give it the character of malleable iron that the special process is required. The casting is now placed in hermetically sealed pots or boxes surrounded by powdered ore, and subjected for several days to intense heat, which, by cementation, gradually softens it and renders it malleable to the core, when it may be bent or wound into any shape. The annealing process takes ordinarily about ten days. Thus a pot made up on Tuesday is got up to a white heat about Friday, and this heat is maintained for some twenty-four hours or more, according to the size or thickness of the article annealed. The fire is then allowed to die down, and when the mass is cool the castings are found to be thoroughly annealed and malleable. Scarcely a trade in Birmingham fails to use malleable castings for some purpose or another.

"The introduction of Bessemer steel has somewhat operated against the trade, but there is still a great field for malleable iron founders in catering for the requirements of the Birmingham gun, harness, and engineering trades."

The journal quoted thinks it much to be regretted there is not a more free interchange of ideas and experience among English iron founders, as in this only is there hope that the English trade can keep pace with German and French progress in the art.

Courage, Ingenuity, and Perils of Firemen.

The perils to which firemen are frequently subjected and the courage with which they are faced are scarcely inferior to the dangers met with and courage evinced by brave soldiers on the field of battle. If statistics were carefully compiled, we think the loss of life and personal injuries sustained by the trained corps that by day and night guards this city from conflagration would more nearly approach the proportion usually killed and wounded in active military campaigns than we could easily believe. They are a noble, though a small army, which yearly gains respect from our citizens; and they often perform heroic deeds that merit a higher reward than the praise bestowed by the chronicler who records the story.

A rare instance of the exercise of great ingenuity under circumstances of great personal danger occurred in a recent fire in this city, an account of which we transcribe from a leading daily:

A portly man was imprisoned by fire and smoke in the fifth story, and there were no ordinary means of reaching him. The adjoining house was smaller, its roof reaching about half way between the fourth and fifth story windows of the burning structure. A fireman reached this roof with a small ladder. He then slid down the ladder until he could get into the fourth-story window, but he found it impossible to ascend to the fifth floor. Then he put the short ladder on the window sill and held it flat against the building, so that it would reach to the story above, and on this support the man whose life was endangered descended. The men were now together, but not out of danger. The ladder was next put with one leg on the sill, but aslant, so that it would reach over to the roof of the adjoining house. Held in this position by the fireman at one end and volunteer assistants at the other, it formed a very dangerous but, as it proved, successful means of escape for the citizen whose life was endangered. The fireman was now left alone, but escaped by the same path, trusting entirely to the grip of the men at the top of the ladder. All this was done at the height of thirty or forty feet from the stone sidewalk, in the midst of excitement attending a great fire. The man who does such work with the necessary quickness of invention and cool bravery deserves something better than the mere wages necessary for his existence, with the chances that, if injured or disabled in the service, he will be discharged as useless.

SLATE PENCIL MACHINE.

It is easier for the schoolboy, with his innate inquisitiveness, to ask how slate pencils are made than it is for the boy of larger growth to answer; however, the machinery employed in making slate pencils is very simple, and the process will be readily understood by studying the annexed engraving.

The bed of the machine has a series of diagonal slots, in which multiple knives, shown in Fig. 3, are clamped by set screws. These knives differ in form and in the size of their curved cutting edges, and the smaller knives succeed the larger ones in acting on the slate blanks.

Opposite the cutting edges of the knives there is a groove adapted to slides capable of carrying blanks, from which the pencils are made. At the receiving end of the machine a frame arranged to slide lengthwise of the main frame is pushed forward by a cam and drawn backward by a weight.

The slate blanks from which the pencils are made are brought to a uniform thickness and length, and are placed on the slides, and put in the machine, one at a time, as the sliding frame falls back.

When the cam pushes the frame forward the slate blank is pushed through the first set of knives. When the next blank is pushed forward in the machine the first one is pressed beyond the second set of knives, and so on. When the blanks emerge from the machine after the first cutting the pencils are half formed.

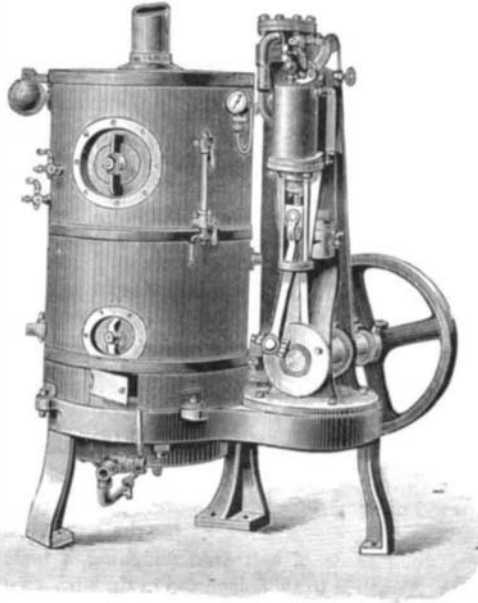
The blanks are reversed and again put through the machine, when they are separated, and the finished pencils are delivered in a receiver at the end of the machine. This machine is the invention of Mr. J. C. Richards, of Brooklyn, N. Y.

Remarkable Locomotive Explosion.

On the night of the 23d of January, 1881, a freight engine on the Philadelphia and Reading road was sent out from Palo Alto, Pa., to bring in a train of loaded coal cars from a siding. An hour later the engine was found a mile beyond the siding with all the crew—engineer, conductor, and two brakemen—dead and terribly mutilated. The boiler had exploded, tearing the engine to pieces and killing all the men. As the explosion occurred in a very lonely place and all the men were killed, no details are known.—*Railway Gazette.*

ENGINE WITH GAS-FIRED BOILER.

The annexed engraving, which we take from *Iron*, illustrates a useful vertical engine combined with a gas-fired boiler, which was lately exhibited at the Agricultural Hall, Islington, for the first time, by its designer and manufacturer, Mr. E. S. Hindley, of Burton, Dorset, England. The engine is self-contained, occupies a very small space, and works without vibration, all the parts being strong and well proportioned. It can be supplied separately from the boiler, and either thus or in the combination which we illustrate in

**ENGINE WITH GAS-FIRED BOILER.**

reported to do excellent work. The boiler contains a large number of brass tubes running the entire depth from top to bottom. The gas is burned in a chamber below mixed with air, the burner being so constructed that any one or more can be lighted so as to vary the consumption to the power required. No attention is required besides occasionally regulating the feed-water cock; steam is raised in about thirty five minutes, the boiler is neatly lagged with mahogany, and there is a feed-water heater supplying not only the boiler with water at over 200°, but supplying a large quantity of

cases where, without it, filling or recrowning would be impracticable. The patent covers broadly the use of hollow pivots with central removable stoppers for dental purposes.

Mr. Charles J. Schumaker, of Alleghany City, Pa., has patented a novel puzzle-game board, which consists in a sheet or board having twenty-one numbers arranged in the form of an octagon, which numbers are connected with each other by a series of rectangular and radial lines. Each number is provided with a pin, and to solve the puzzle all the pins must be taken out by one pin, by means of jumping over the others upon vacant numbers, and when the last pin is taken the player's pin must jump into a number that has been previously designated.

Mr. John F. Hoffman, of Cincinnati, Ohio, has patented a new paint for application to tinned roofs and other structures exposed to the weather. The ingredients are light dead-oil of coal tar obtained by distillation and treated with quicklime, rosin, and asphaltum, melted and mixed by heat in certain proportions.

Mr. Henry Textor, of Brooklyn, N. Y., has patented an improved sewer trap which will prevent the flow of back-water, and which cannot become clogged by sediments or floating matter. A hemispherical or cup-shaped vessel is connected with the sewer and provided with a cup-shaped strainer containing a hollow metal float which is raised by back-water and pressed against the lid of the vessel. The latter is provided with a central aperture and is covered by a strainer held down on the vessel by a removable screw clamp. An opening provided with a screw plug serves for cleaning the trap.

Mr. Henry B. Sherwood, of Westport, Conn., has patented a tool handle for hand-weeders, currycombs, and various other tools, which is firm, strong, and durable. The wood handle is formed with a transverse borehole and two grooves leading therefrom to the end, upon which is placed a ferrule. The wire shank is passed through the hole and bent down into the grooves, in which the ferrule holds it securely when applied. The ends of the wire are then spread apart and may be secured to the tool by riveting.

Mr. Henry D. Starr, of Texana, Texas, has patented an improved bale-tie buckle, so constructed that the bale can be easily and quickly tied, and it will hold securely. The buckle is made of a plate having four transverse slots formed therein, thus forming five crossbars, and having the second bar rounded or thickened to adapt the buckle to be hinged to one end of the tie, and also having its fourth bar stamped into a loop form to receive the other end of the band.

Mr. Edward P. Haff, of Brooklyn, N. Y., has patented a razor strop so constructed as to present on one side a fixed oval strop, and on the other a flexible strop the tension of which may be regulated.

Mr. John A. Moore, of Woodville, Tenn., has patented a combined cotton scraper, chopper, and cultivator, so constructed that the cotton will be scraped, chopped to a stand, and dirtied at one passage along the row, and which can be adjusted to work closer to or further from the plants and at any desired depth in the ground.

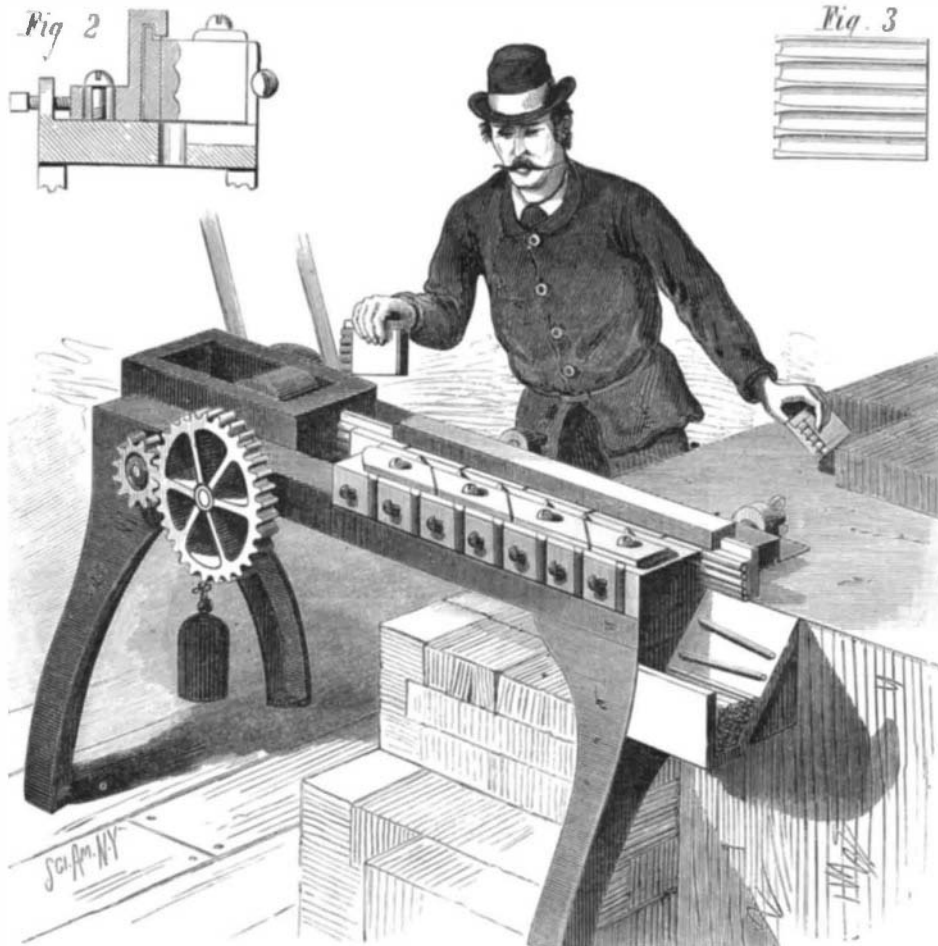
Mr. Frederick W. Jackson, of Watkins, N. Y., has patented a wall paper exhibitor by means of which any number of samples can be exhibited rapidly and advantageously. An endless carrier is formed of a close series of slats movable in guide grooves. The slats to which the samples are attached are provided with studs which are engaged by a median spur wheel for turning the series. The samples are displayed upon an inclined apron.

Mr. Edward Barnard, of Rome, N. Y., has patented a quarter boot for horses, which, being an improvement on an invention for which he obtained letters patent No. 237,157, dated Feb. 1, 1881, causes the quarter boot to fit the heel of the hoof more closely and to keep in place better, and at the same time gives the article a neater appearance.

Mr. John B. Shaffer, of Kearney, Neb., has patented a well bucket so constructed that when lowered into the water it will readily fill, which holds the water securely while being raised and when standing in the spout, which can be readily emptied in part or wholly, and which is simple in construction and easily repaired.

Messrs. Charles Tyrell and Edward Kearns, of Norwalk, Conn., have invented an improvement in hat-pressing machines, which provides for more accurate and convenient adjustment and regulation of the pressure in machines for pressing hat-bodies, and which much increases the range of adjustment. The construction is simple and well calculated to secure the ends sought.

Mr. James Hill, of Providence, R. I., has patented a jappanning oven, in which a novel construction and a blowing apparatus connected therewith secures a uniform temperature of the air throughout the oven while baking the articles to be jappanned.

**MACHINE FOR MAKING SLATE PENCILS.**

hot water besides for other purposes, and which costs nothing to heat. This renders it valuable for many trades requiring hot water, and also in stables. It is so safe from risk of fire that some of them are at work in the midst of hay and straw—cutting chaff, etc.

MISCELLANEOUS INVENTIONS.

Mr. Philip A. Palmer, of Chicago, Ill., has patented an improved means for treating teeth, and for preserving work done upon a tooth while permitting access to the pulp cavity for treatment. It consists of a hollow screw, into the outer extremity of which a smaller screw is inserted, which can be removed to permit access to the pulp cavity and replaced. Teeth may be filled or recrowned by the use of this device in