

**New Inventions.**

Mr. L. P. Taylor, of South Orange, N. J., has invented an improved Type Holder for Hand Stamps in which regularly recurring changes are made. The type box, having one or more compartments, is provided with lifters and followers which raise the type in turn, as desired, in a simple manner.

Mr. Jonathan Miller, of Hinrad's, N. Y., has improved upon the Apparatus for Making Tea or Coffee, previously patented by him, by modifying its form so as to adapt it to be made of stone ware.

An improved Latch, for barn doors and similar positions, has been patented by Mr. B. Hollingsworth, of Sigourney, Iowa. It consists of a pendent bolt dropping into blocks on the door casing and locking the latch proper, which is opened by a string from the outside, as usual. The bolt is raised or lowered by means of a cord, which is carried by pulleys to a convenient and concealed terminus.

Mr. H. L. St. Clair, of Vineland, N. J., has invented an improvement in hand Washboards. The bed, or friction surface of the board, is formed of rollers, which are square or polygonal in cross section. The labor of rubbing clothes on such a surface is obviously less than on a fixed surface. One of the side bars of the washboard is provided with a hinged section, which permits the rollers to be easily put in or removed as required.

A new Fire Escape has been invented by Mr. Sylvester Root, of Kentland, Ind. A drum, having two separated grooves, in which ropes are attached so as to wind in opposite directions, is mounted in a frame which is hinged at the side of the window casing, so that it will swing into and out of the window. The free end of the swinging frame is provided with hooks to catch on a bar which spans the window casing transversely, and serves to support the frame when the drum and ropes are in use.

Mr. E. F. Gordon, of Concord, N. H., has invented a strong and simple Clamp for general use. At the lower end of the standard a beveled head is formed, which fits into a dovetail slot in an iron strip let into the bench. The sliding arm of the jaw is operated by an eccentric lever, which is shaped so as to prevent it from turning when the jaw is under pressure.

A new process and apparatus for Extracting Glycerin from Fats has been invented by Mr. Frederick Sahlfeld, of New York city, who employs steam for the purpose of mixing the fatty matter and chemicals; not by direct action, but indirectly by the use of revolving steam-heated stirrers, the mechanical action and the contact of the surfaces of the stirrers with the fatty material expediting the separation of the glycerin.

An improved Chimney Cowl consists of a pipe closed at its upper end, and having lateral discharge openings near the top, and surrounded by a thimble, between which and the pipe are formed vertical passages for the discharge of smoke and movement of wind. This device has been patented by Mr. J. W. Androvatt, of Prince's Bay, N. Y.

Mr. Moritz Leiner, of New York city, has patented an improved Brush, for bathing and other purposes, composed of a series of round brushes made of bristles retained in twisted wire strands, the brushes being attached to flexible bindings at the ends, and provided with a suitable handle.

A convenient Device for Sizing Rings, intended for the use of jewelers, has been patented by Mr. Edward Davies, of Brooklyn, N. Y. It consists of a dieplate having a number of tapering holes of different sizes, in connection with a corresponding number of tapering punches having annular recesses at the ends, fitting the different sizes of rings, and either contracting or expanding them by driving them into the die holes.

**Influenza.**

Dr. D. H. Beckwith, in a paper published in the Cincinnati *Medical Advance*, says: "That theory which commends itself to my acceptance is that a deficiency of ozone in the atmosphere will cause influenza, catarrh, hay fever, cholera, scarlatina, and diphtheria, while an increase of ozone in the air will increase bronchial and pulmonary diseases."

"Ozone is defined to be 'oxygen in an active or highly negative state.' Ozone is a constituent in the air, and is remarkable in its properties. It has an odor similar to a spot that has been struck by lightning. In quantities—that is, an excess in the atmosphere—it will attack the mucous membrane of the throat, nose, mouth, and bronchia," so says Hartly. Short says, in his 'Chronological History of the Weather': "Thick ill smelling fogs are preceded by attacks of epidemic catarrh."

**IMPROVED MACHINE TOOLS.**

[Continued from first page.]

which the same automatic movements are repeated, completing the wheel. The spindles run in anti-friction boxes

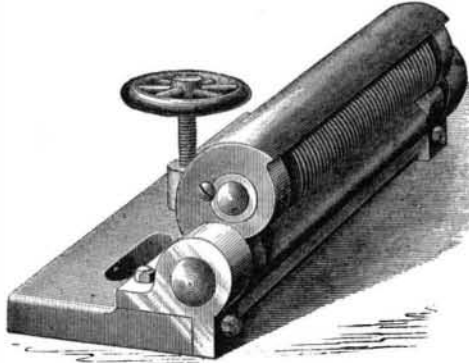


Fig. 4.—GRINDSTONE TRUING DEVICE.

provided with means of compensation for wear. The machine is of neat design and carefully constructed, and is accompanied with complete self-oiling overhead works. Special fixtures for wheels of any given form and size can be readily attached, while, on the other hand, one machine only can be supplied if required. With the two machines upon the one bed the weight, including the overhead works, is about 1,000 lbs. The heads, having what is technically known as a box frame, are very strong and rigid in proportion to their weight, while their interiors can be used as closet room for the cutters.

Fig. 3, page 271, shows an automatic balance wheel turning

spindle of the machine and the tool posts automatically cease revolving. The centers around which the tool posts revolve are adjustable, and allow a variation in the size of the wheel to be turned of from 6 inches to 7 inches in diameter, this adjustment being made by simply turning a screw.

The feed works or motion are all inclosed in the base of the machine, and are readily accessible for oiling. The spindle of the machine is of steel, made with large bearings working in boxes, which are provided with means of compensation for wear, and is strongly geared. The cone has two speeds, and is driven by a belt 1½ inch wide. With the counter-shaft, self-oiling hangers, etc., the machine weighs nearly 1,000 pounds.

**Driving Piles in Sand.**

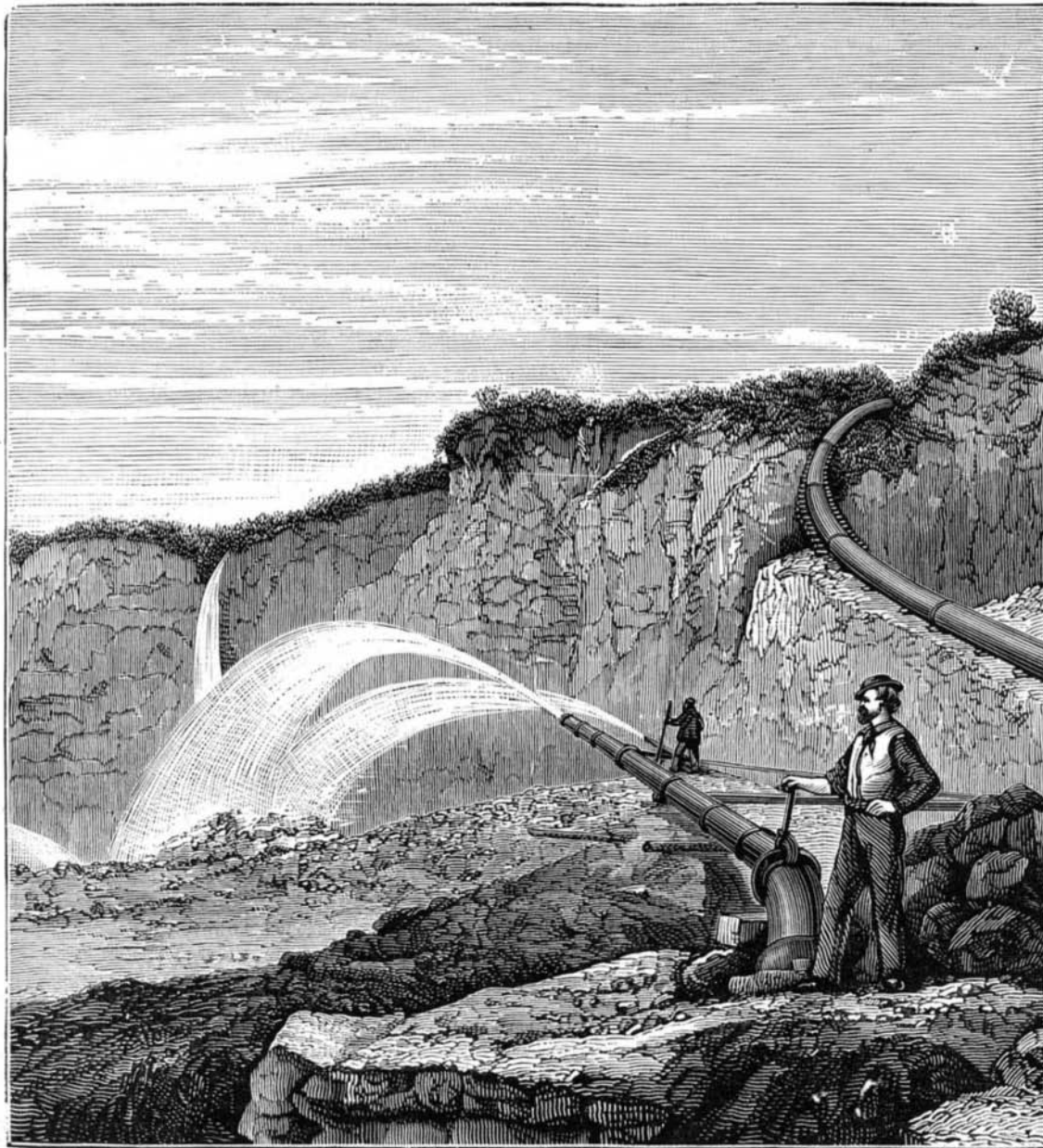
The contractors who had charge of preparing the sheet piling which was to protect the hospital at Berck-sur-Mer, in France, were much troubled in driving the piles by the compactness of the wet sand, and finally made use of tubes which were driven at the same time with the pile, their lower ends being a few inches below the points of the piles; through these tubes water was forced by small hand engines, and so loosened the sand that the advance of the pile was easy and rapid. In the case of the panels of sheet piling, the benefit was even more marked. Careful observations showed that by the ordinary process it took, on an average, 185 strokes to drive a ten inch pile ten feet, while 900 blows were needed to drive the panels. The hammer weighed 1,320 pounds, and had a fall of six and one half feet. The average time required to drive a pile and panel was eight hours and a half. After the device of loosening the sand by the pressure of water was adopted it was found that the average time required to accomplish this was one hour and nine minutes, while to drive a pile and a panel more than fifty blows were never required, and often the mere weight of the hammer was enough to sink the pile.

**HYDRAULIC MINING IN CALIFORNIA.**

The rich gold placers of California, where for a brief period fortunes were made by the use of the most primitive appliances, such as the pan, the rocker, and the "long tom," soon became exhausted, and it became necessary to turn to the original sources of gold in the quartz veins, or to work, by combined and systematic effort and the aid of modern mechanical improvements, the masses of auriferous gravel which contained too small a proportion of the precious metal to be profitably treated by the early crude processes. Our engravings give a good idea of how the latter is accomplished.

In place of the pick and shovel, the disintegrating power of water is employed to break up the gravel, often cemented together and containing huge bowlders, and convey it to the flumes, where the gold particles are separated by riffles, blankets, and other devices depending upon the action of gravity or the attraction of amalgamated plates. The success of operations depends rather upon the cheapness and amount of the water supply than upon the richness of the gravel; so low a proportion as 15 to 20 cents' worth of gold to the cubic yard of gravel being at times profitably extracted; while much richer gravel, in places where water is not abundant or has not the requisite fall, often fails to pay.

The water is conveyed from the upper reservoirs by wrought iron pipes capable of withstanding the pressure of a head of water many hundreds of feet high. The limit of strength of the best canvas hose of the necessary diameter is only about 50 feet perpendicular, and 180 feet when braced by "crinoline" of iron or rope netting; and hence it was soon displaced by the stronger material in all permanent workings. The



HYDRAULIC MINING IN CALIFORNIA.

usual dimensions of the iron feed pipes are from 22 inches to 40 inches in diameter, and 0.06 inch to 0.2 inch in thickness, or from No. 16 to No. 7. The water is led to a cast iron distributing box, permanently fixed, and from thence by short pipes to the nozzles. A great deal of ingenuity has been expended upon the construction of these nozzles, and the forms now in use are very effective and easily directed. The stream discharged from them has frequently a

velocity of 150 feet per second, and at a distance of 150 feet to 200 feet speedily undermines the most refractory bank. The engraving on page 274 shows the mode of application, and that at the bottom of this page illustrates a common scene in the foothills of the Sierras, where dozens of streams may often be counted from a single point of view.

The main obstacle in hydraulic mining is not to find material, but to get rid of the refuse. The enormous amount of matter turned into the rivers has obstructed the currents, deposited barren sediment by millions of tons where it was not wanted, and has necessitated the construction of costly levees along the banks of the rivers. The beds of auriferous gravel are from a few feet to several hundred feet in depth, and are measured on the surface by the square mile. The problem of providing a suitable dumping ground is steadily growing in importance.

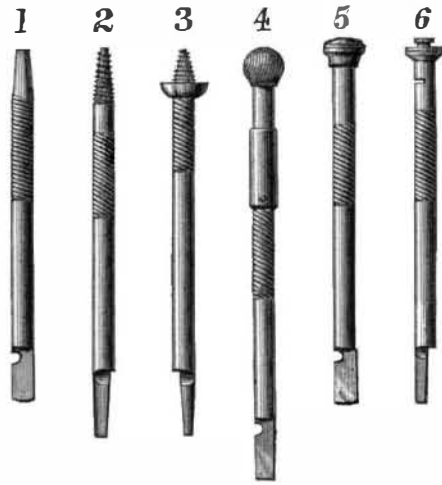
Hydraulic mining differs from all other kinds of mining in that it is nearly free from chance. A given yard of gravel in the center of a bank is a fair sample of the whole, the gold being distributed with remarkable uniformity. Hence, the price of water (which is usually supplied by independent companies), rate of wages, and a few other items being fixed, it is a simple matter to calculate in advance whether a projected enterprise will be profitable, and if so to what extent.

**Iron Chip Removed from the Eye by a Magnet.**

At a recent meeting of the Clinical Society of London, Mr. McHardy read notes of a case of removal of a chip of iron from the crystalline lens by means of a powerful magnet. The patient, thirty-one years of age, when at work, was struck in the eye by a fragment of steel from the hammer he was using. When seen, twenty-four hours after, there was evidence of commencing iritis; there was nothing in the vitreous; the eye was less painful than on the night of the accident; its tension normal. Atropine drops were prescribed. The next day there was no pain, and less congestion of the eye; the pupil was well dilated, and allowed of detection of a sharply defined opacity on the interior surface of the lens in a downward-inward direction from the center, the peripheral end being nearer to the margin of the dilated pupil. The cornea was almost normal. The atropine was continued, and absolute rest enjoined. The removal of the chip appeared to be imperative lest it should gravitate downward; at the same time Mr. McHardy was unwilling to remove the lens, and he also thought if it were injured by the forceps it would not be easy to tell if any subsequent opacity of the lens were due to the original injury or to the operation. He therefore had a magnetic spatula constructed by Messrs. Weiss, intending to use it in connection with an electro-magnet. On Mr. B. Carter's suggestion the procedure was modified by employing a powerful bar magnet connected with two Grove's cells. Gradually approaching it to the front of the cornea, when it was four inches away, the chip sprang from the lens to the inner surface of the cornea, and fell into the anterior chamber, whence it was removed, together with a small portion of iris. A patch of opacity exactly corresponding in size to the chip was left on the lens. Subsequently a cataract formed, and the injured lens became absorbed. The patient's vision, aided by a lens of twelve dioptries, is normal for distant objects. Mr. McHardy acknowledged his indebtedness to Mr. Ladd and Dr. Tibbits for assistance and suggestions, and he referred to a paper by Dr. McKeown, in the *Dublin Journal of Medical Science* for September, 1876, where three or four cases are recorded of the use of magnets in the removal of fragments of steel in the eye.

Mr. Brudenell Carter, having seen the case, stated that the position of the fragment was such that any other attempt at its removal would have jeopardized the eye. If nothing had been done, the fragment would probably have fallen below the iris, and would have set up destructive inflammation; and any attempt at its removal by forceps would certainly have injured the lens. By withdrawing it from its bed and bringing it to the front of the iris, the magnet had obviated these difficulties.

**IMPROVED TOOL STOCKS FOR DENTAL ENGINES.**  
The accompanying engraving represents various forms of a new tool stock for dental engines, which is made flexible. By this construction it is claimed that the various operations of smoothing rough surfaces upon teeth, and of shaping, smoothing, and polishing complicated gold filling, will be much more pleasant to the patient and convenient to the



DENTAL TOOL STOCKS.

operator, than when the same is done with wheels, disks, or points mounted upon rigid stocks. There is also much less liability to break thin and delicate corundum disks.

The stock is formed by coiling a wire spirally, and then coiling a second wire in similar manner about it in opposite direction. The wires do not uncoil. The device may be made flexible along its entire length, or partly flexible and partly solid, so as to possess various degrees of softness. In the illustration, 1 is a plain drill stock; 2, a screw head without shoulder; 3, same with shoulder; 4, stock for carrying wood points and large plug finishing burrs; 5, screw head, pattern of Dr. Robert Huey; 6, pattern of Dr. John M. Hurtt.

Patented through the Scientific American Patent Agency

chinery, with alternate stripes of red and blue litmus. For use, the paper is cut so that stripes of red and blue lie side by side on the same piece. This affords a convenient means of ascertaining whether a solution be acid or alkaline, by a simple dipping of one and the same piece of paper, instead of using two kinds, as in the old method.

**The Bricklayers' Strike.**

The success of the bricklayers' strike for an increase of wages affords a notable indication of revival in at least one line of business. This is the first instance of the sort since the panic. In every case builders with large contracts on hand promptly yielded without dispute to the restoration of the rate of pay to the standard formerly agreed upon. The leaders of the Bricklayers' Society are naturally elated, and express the opinion that the summer will bring still higher wages. Work on the Brooklyn Bridge was not hindered, the men at work there being paid at the rate of \$2.50 a day.

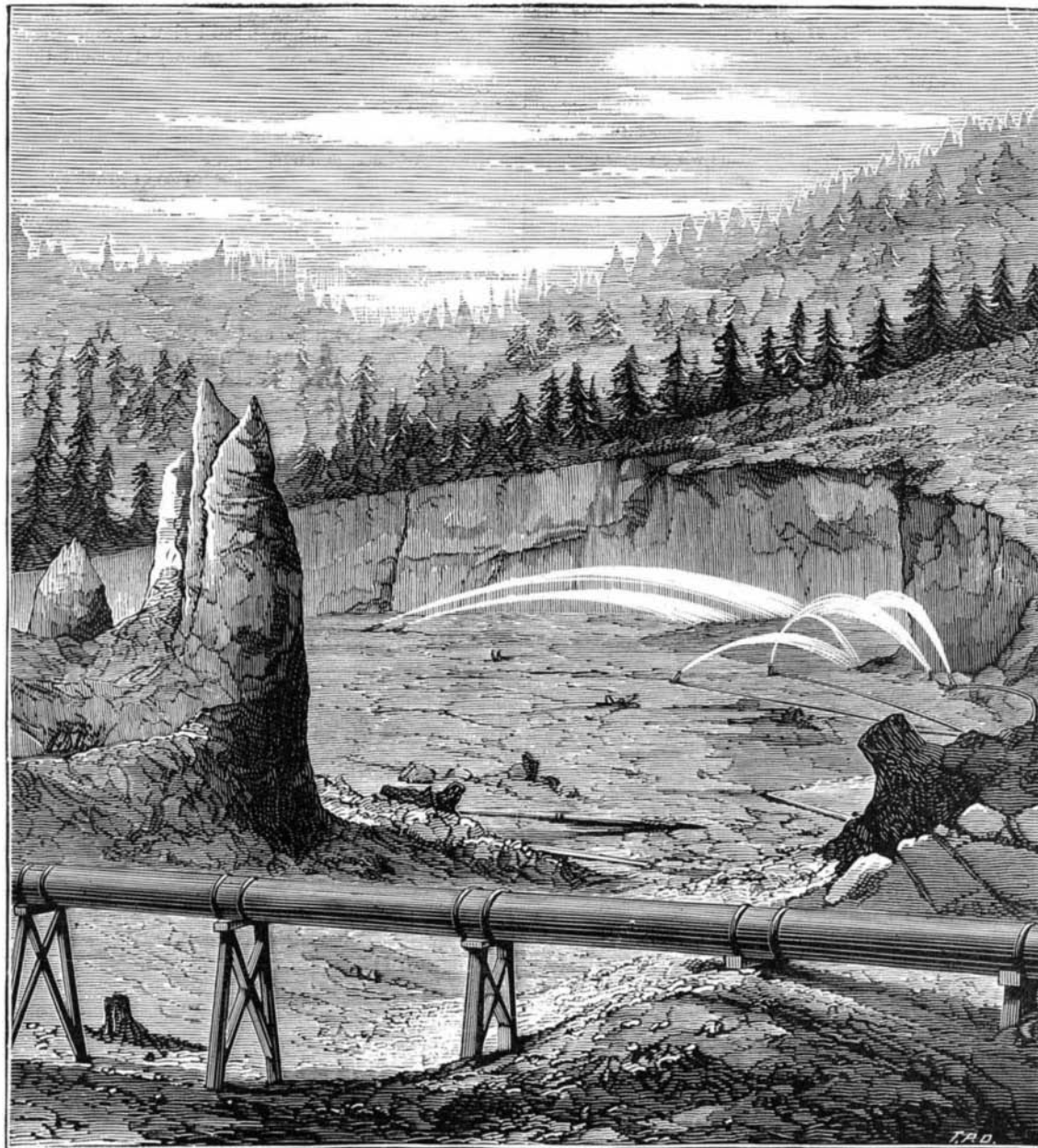
**Bee Stings.**

Mr. J. D. Hyatt, President of the New York Microscopical Society, gave an account of his investigations on the subject of stings. These studies have extended over a period of eight years, but only recently have some obscure points been made out. The general form of the stinging organs of the honey bee is well known by microscopists. It consists of a horny sheath, within which there are two stings, and these, when in use, are thrust out. There is a poison bag which discharges its contents into the sheath. This is a point well known, but it appears that the precise method by which the fluid makes its way from the sheath into the wound has not heretofore been properly explained. According to the generally accepted explanation the poison is supposed to flow in a channel formed between the two piercers or stings, and in this way makes its way into the wound. Mr. Hyatt advances another hypothesis, and believes he has positive proof that he is right, having dissected and examined upwards of a thousand stings.

On examining a properly prepared sting from a honey bee we notice first that the piercers are very sharp, and barbed for some distance from the end, there being nine barbs pointing upward on each one. These barbs are gracefully curved, and it can easily be seen that when once they find their way into the flesh it would be difficult to withdraw them. This explains why the honey bee sting remains in the flesh, while the stings of other insects, with finer barbs, are withdrawn.

A more careful observation indicates that the stings are tubes. There appears to be a channel running through the length of each one, having branches which terminate in the notches just above the barbs. After careful study of these channels, many of which were found to contain air or water after mounting, and were thus proved to be veritable channels, the question arose as to their use. The natural inference would be that they were ducts for the poison, but there could be found no possible connection between the poison gland and these channels, for, as already stated, the poison flows into the sheath.

After long and patient investigation the explanation offered is as follows: At the back part of the sting these channels open into the sheath, and just in front of that opening, attached to the stings, is a sort of valve which projects into the sheath. When, in the operation of stinging, the piercers are thrust out, they carry forward this valve so as to close the front of the sheath, for which purpose they are admirably adapted, and the poison thus confined within the sheath makes its way out through these openings in the stings. When once understood the operation seems very simple. There are also some objections to the common explanation. Cross sections of the stings show that the walls are quite thin, but strengthened in certain places by internal deposits. The form of the stings is such that no channels can be formed between them to conduct the poison.



**HYDRAULIC MINING IN CALIFORNIA.**

July 24, 1877. For further information relative to manufacture on royalty, purchase of patent, etc., address the inventor, Dr. Edwin Telle, New Orleans, La.

**New Test Paper.**

The *Deutsche Industrie-Zeitung* states that the paper and chemical manufactory of Eugene Dieterich, near Dresden, has lately produced a test paper colored, by means of ma-