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.

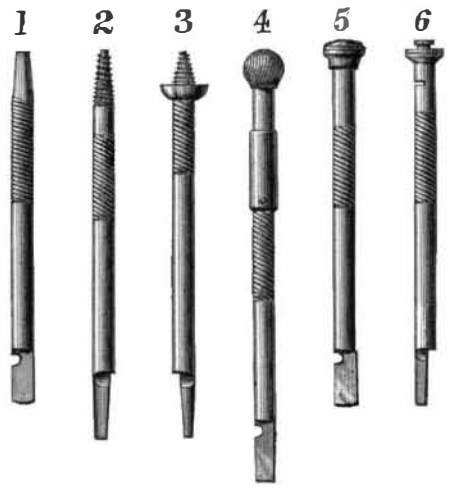
Iron Chip Removed from the Eye by a Magnet.

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 dioptrics, 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.

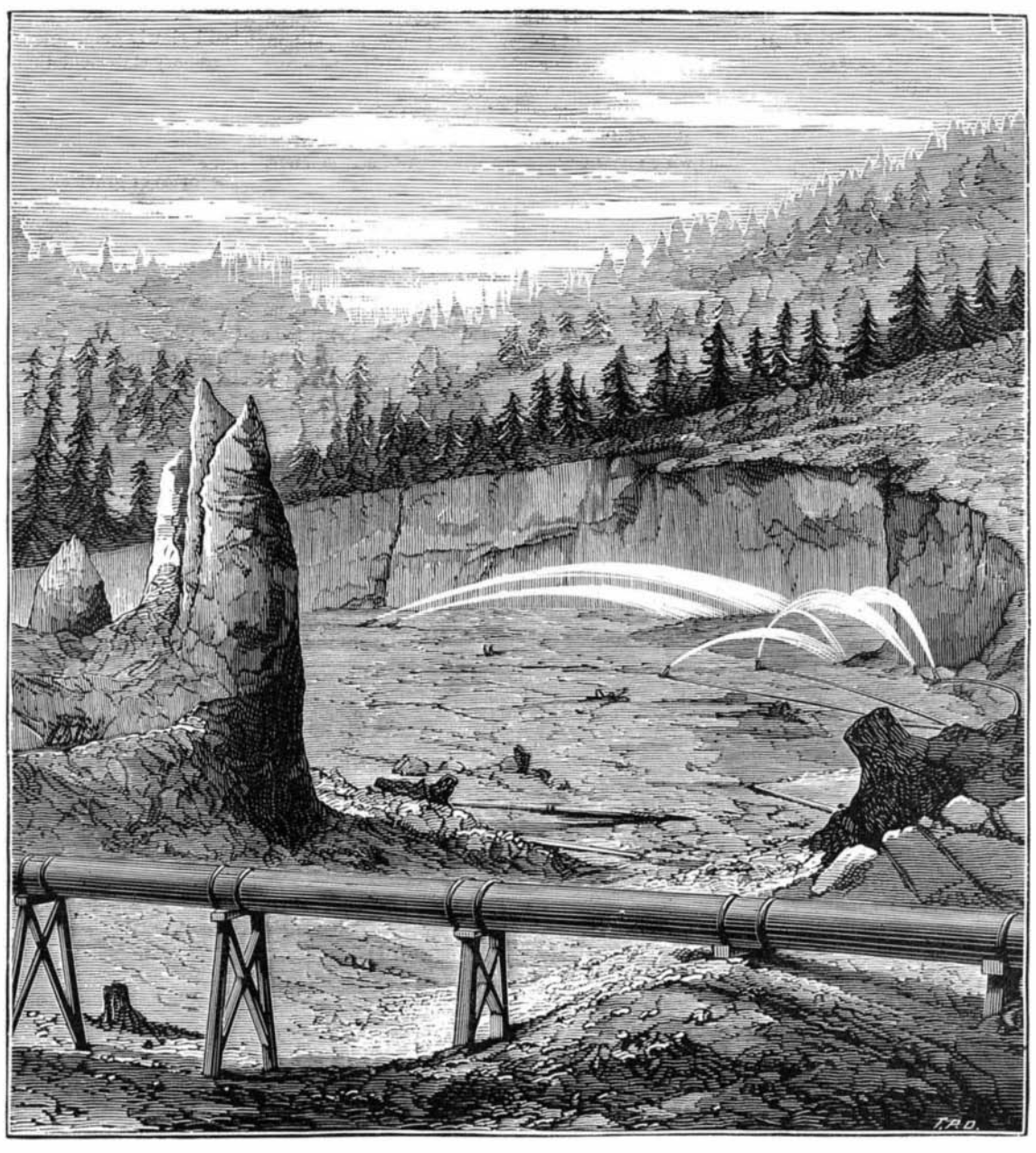
The accompanying engraving represents various forms of a new tool stock for dental engines, which is made flexible. By this construction it is claimed that the various operations of smoothing rough surfaces upon teeth, and of shaping, smoothing, and polishing complicated gold filling, will be much more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



DENTAL TOOL STOCKS.

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



HYDRAULIC MINING IN CALIFORNIA.

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 machinery, 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.