

**NEW COTTON CHOPPER.**

The engraving shows a cotton chopper having a carriage with gear wheels connected with its rotary axle and driving two shafts connected endwise by a universal joint. Radial arms attached to the rear shaft carry the chopping knives, which revolve at the rear of two plows provided with adjustable colters for barring off the rows. An upright frame is connected with the carriage frame and provided with handles, and a swiveled bearing for connecting the plow beams and handles with the shaft, so that the chopper can be readily guided and controlled.

The radial arms carrying the chopper knives are slotted to admit of adjusting the knives so that they may work at any desired depth in the ground, and to leave more or less of the plants standing, as the adjustment to and from the center opens and closes the distance between the knives.

The knives are set at an inclination with the plane of the chopper wheel, and their entering ends are sharpened so that there will be space between the rear end of each knife and the point of the one following to leave enough plants for a hill.

This implement is easily managed, very simple in its construction, and is well adapted to its purpose. It was recently patented by Mr. Josiah L. Hughes, of Cleveland, Tenn.

**Action of Telephonic Currents upon the Galvanometer.**

If in a telephonic circuit we substitute for the receiver a very sensitive galvanometer, and if we act upon the transmitter by means of a tuning fork, an organ pipe, or the voice, we observe no deviation as long as the sound preserves the same intensity, but as soon as it increases or diminishes the needle deviates. This movement changes its direction according as the amplitude of the vibrations of the sounding body increases or decreases. The effect is most marked when the transmitter is affected by a sound of short duration, such as a detonation or by a body struck slightly upon the vibrating plate. In the latter case, the needle of the galvanometer leaps like the second hand of a clock. The experiment succeeds well if the sounding body is approached to or withdrawn from the transmitter. These deviations appear much more distinctly when a microphone transmitter is used, such as that of Ader, but they are visible with every kind of telephone.

The explanation appears simple. As long as the oscillations of the vibrating plate retain the same amplitude, and consequently the same speed, the induced currents at each complete vibration compensate their action upon the galvanometer alternately in both directions, whether they proceed from an electromagnet or from a microphone. But if the oscillations tend, *e. g.*, toward zero, each odd semi-oscillation has a greater amplitude than the even semi-oscillation following, and the induced currents, direct and inverse, no longer set in motion, two and two, the same quantity of electricity. The residues of the same direction in each complete oscillation accumulate so as to deflect the needle, and the deflection is the greater as the decrease is the more rapid.—*M. de Chardonnay, in Comptes Rendus.*

**Photo-Zinc and Platinum Process.**

Captain Biny proposes to treat with dilute platinum bichloride a polished zinc plate on which a negative image, with all the half tones (taken from a positive), has been impressed by means of coal tar. He finds that a kind of daguerreotype of great delicacy is produced on the zinc, and with exquisite modeling. These prints will be cheaper than the daguerreotypes produced by the deposit of mercury on silver plates. So far as I know—and it will be easy to verify the statement by experiment—the black oxide of platinum is deposited to a greater or less degree on all the parts of the zinc plate that are denuded; the half tones of the image formed by the coal-tar will be the resist, and the deposit will be proportional to their intensity. In other words, we shall have an image which, owing to the black color of the oxide of platinum, will be in harmonious contrast with the bright tint of the metallic zinc, and which will be perfectly modeled.

**NEW DISINTEGRATING RIFFLES.**

Notwithstanding all the modern improvements in mining machinery, immense quantities of precious metals are con-

stantly washed away and irrecoverably lost. The value of this lost portion, according to various estimates, is very nearly if not quite as great as that of the metal secured. A great deal of engineering skill and inventive genius have been employed in trying to devise means of preventing this great loss. This has generally resulted in placing various devices in the sluices to catch and retain the stray particles of metal or sulphuret. Some of these inventions have been more or less successful, but none of them have saved anything like a reasonable proportion of the valuable part of the tailings.

Our engravings represent a new form of riffle, which has been in use in quartz and hydraulic mining for over three

in sections while securing their accumulations, thus avoiding the necessity of an entire stoppage of work.

Although the illustrations show the form and arrangement of the riffle sections, we give the following brief description:

A is a section of mining flume, or sluice, through which auriferous material is carried by a stream of water. On the bottom of this sluice the riffle sections are placed, covering the bottom of the floor, in longitudinal rows, with ends joining each other. The sections in one row overlap or break joints with the sections of the adjoining row. The incline on each side of the apex of each section is provided with a number of parallel slots, B, extending its entire length. The portion, C, of metal between each pair of slots is hollowed out on its upper surface, forming channels. In the transverse shallow box, E, at the bottom of each incline, quicksilver may be used.

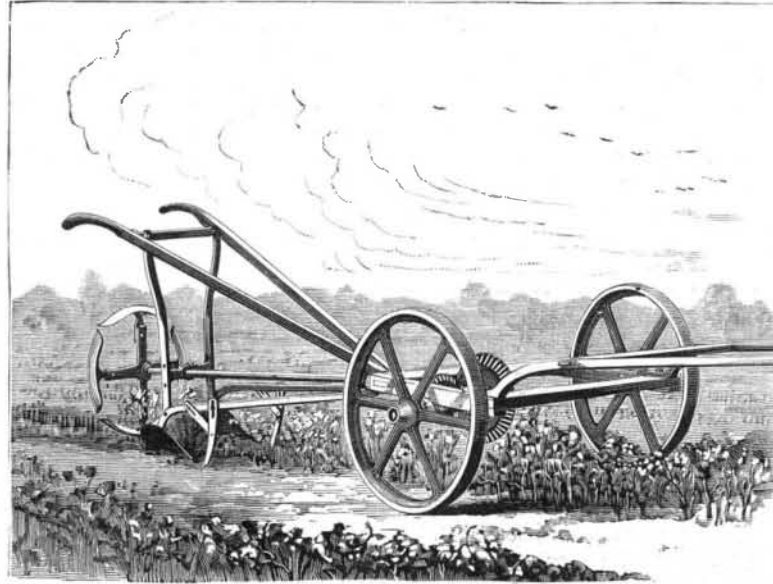
A vertical partition, F, extends downward from the under side of the ridge or apex to the floor of the flume, forming a riffle or obstruction for arresting the heavy particles. The material passing through the slots into the chamber underneath the section is arrested by the partition, F, and an eddy is formed in which the heavy particles settle, while the water and lighter material pass on through the open sides of the chamber diagonally across upon the first incline of the following section in the adjoining row, where the operation is repeated. The current is thus broken and separated, and directed from one section to the other, and from one row of sections to the other row, throughout the entire length of the floor of the sluice. The effect of alternating the sections in the adjoining row is to produce cross currents, which prevents the sand and clay from packing, and washes the sulphurets and heavy particles, thus keeping them in clean condition.

For further particulars address the New York Mining Machinery Company, 39 Broadway, New York.

**Diphtheria.**

Dr. Franklin Staples, of Winona, Minn., after an extended correspondence with physicians in most of the counties of his State, has published a report on diphtheria, in which he classes the disease as contagious and infectious, and demonstrates that it is on the increase—a fact due, in his opinion, to failure on the part of physicians in recognizing its self-propagating properties; to want of systematic nursing of patients suffering from the disease; to incomplete disinfection of premises attacked; and last but not least, to the frequent intercourse of convalescents with healthy persons. He maintains that strict regulations, rigidly enforced, are the only means adequate to cut short its career, and since individual power is unable to cope with it, urges that every city and town should devise efficient sanitary laws, and let them be enforced by intelligent medical officers, who shall also make it their duty to instruct the people in sanitary rules. To guard against contamination, he believes that filth, whether from dirty rooms, soiled clothing, defective drains and cess-pools, ill-ventilated rooms, poisonous inodorous gases, etc., should be regarded as conditions which invite the disease; that the apartments set apart for the patient should be divested of all furniture, carpets, curtains, and fabrics of any kind not absolutely required; that discharges from the nose, mouth, and bowels should be carefully collected and destroyed, and that all personal clothing, bed linen, etc., should be thoroughly disinfected before being sent to the general wash. In case of death, all clothing and unimportant articles should be burnt, the body should be immediately disinfected and put into its coffin, which should be kept permanently closed. There should be no public funeral. He prefers disinfection by chlorine gas, which is to be set free in the room. Ventilation for a number of hours should then be insisted upon. Precautions falling short of these Dr. Staples considers to be useless in preventing the spread of the infection.—*Report on Diphtheria to the Minnesota Board of Health, 1881.*

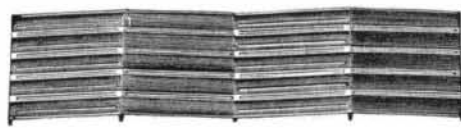
**PATENTS IN GERMANY.**—Last year there were 7,177 applications for patents in Germany; 4,339 were granted. This is the largest number granted in any year save one, 1879, when the number of patents issued was 4,410.



**HUGHES' COTTON CHOPPER.**

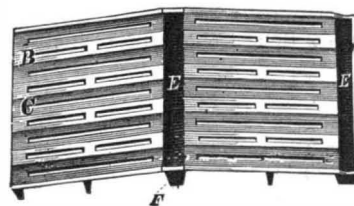
years, and has proved itself effective in saving the largest possible percentage of the precious metal.

This riffle imparts to the water almost every conceivable movement, producing under currents, cross currents, eddies, etc., and the peculiar form of the riffle sections insures the pulverizing of any lumps that, in hydraulic mining, may be carried along by the current, and induces the precipitation of the particles of gold and sulphurets. It is claimed that this riffle, wherever used, has demonstrated that, as a concentrator of all classes of ores, it has thoroughly proved its superiority.



**No. 2 MILL RIFFLE WITHOUT CUPS.**

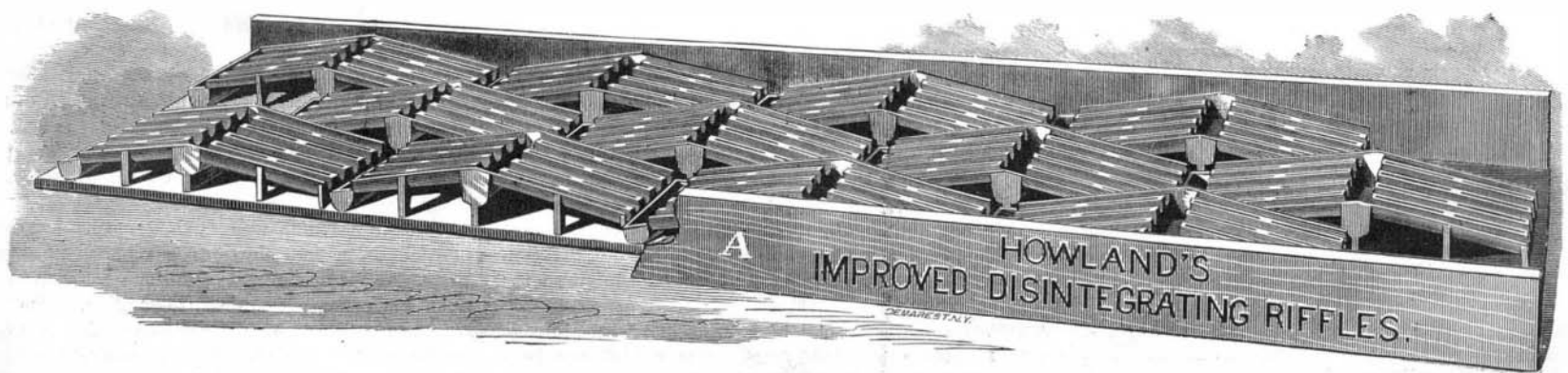
The simplicity, durability, and inexpensiveness of these riffles must commend them to universal use, and the increasing demand, together with the strong testimonials and unqualified indorsement of those now using them, serves to show that they are destined to supply a want heretofore unsatisfied in the direction of close working of mineral ores.



**A RIFFLE SECTION.**

We are informed that it is immaterial what amount of water is used in their operation, so long as the quantity is sufficient to move the pulverized material as it comes from the mill or pan, and also that they prevent the loss of all quicksilver that escapes from the mill or amalgamator, a most important feature, considering the amount that so escapes, and that by any other process fails to be secured.

Another point in their favor is that they can be removed



**HOWLAND'S DISINTEGRATING RIFFLES.**