

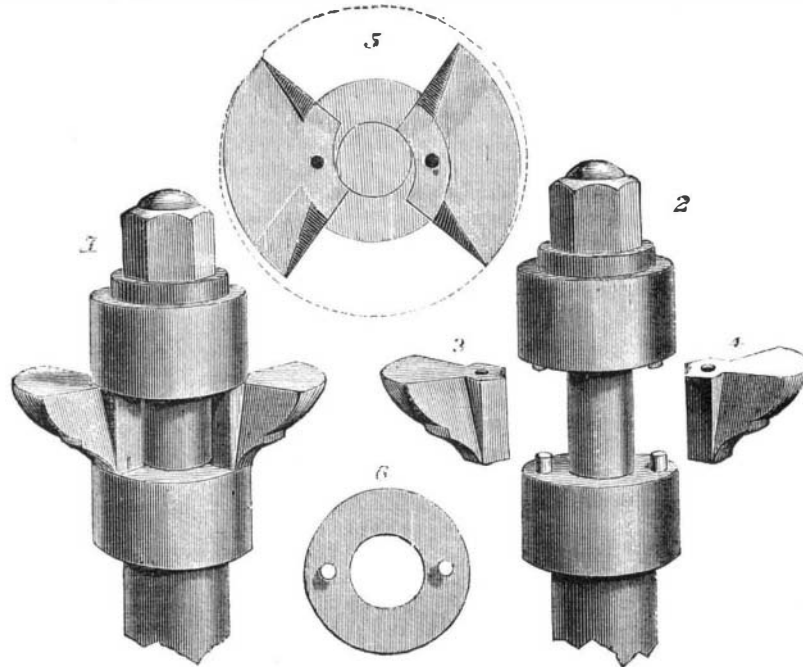
**Molding Cutter Heads.**

Our engraving illustrates an improvement in the construction of that class of "freizing bits," or rotary cutters for wood working machines, which are adapted to reverse, so as to present a cutting edge in either direction.

Fig. 1 is a perspective view of the improved cutter ready for work. Fig. 2 is a perspective view of the same, showing the collars ready to receive the bits. Figs. 3 and 4 represent bits removed from the collars. Fig. 5 is a cross section through the bits and spindle, the dotted lines showing the clearance. Fig. 6 shows the face of a collar, with the pins on which the bits are pivoted. Without further explanation, it will be seen how, by the peculiar shape of the bits and their connection with the collars, they are made to turn on the pivots, according to the direction of rotation, and stop (in either direction) when they present a clear cutting edge in front and clearance in the rear. When desired to reverse the action, the nut seen in the figures is slightly loosened, the bits are placed in proper position, and the nut again tightened.

For manufacturers of moldings, furniture and picture frames, this invention seems well adapted, and the inventor claims it to be equally important to all kinds of wood working. Patented April 16, 1872.

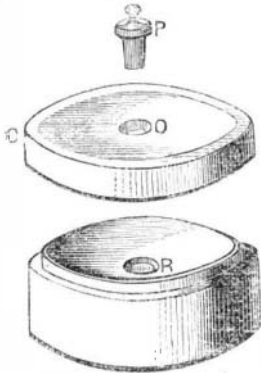
For further information, address Hope Machine Company, 181 West Second street, Cincinnati, Ohio. See advertisement in another column.



**CUTTER HEAD MOLDING MACHINE.**

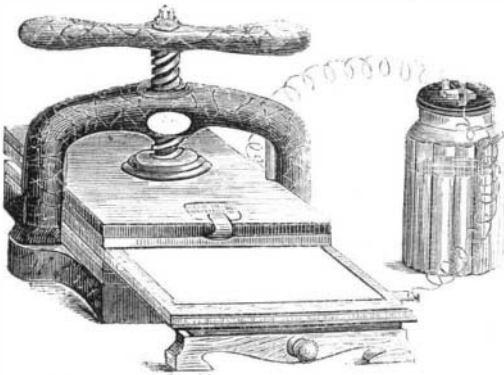
**RESERVOIR PALETTE.**

It is well known to draftsmen that it is evaporation, rather than use, that so rapidly diminishes the liquid, color, or ink; and moreover, the material particles or sediment are prejudicial to high class work. The reservoir palette is designed to remedy these defects, which it does perfectly by simple means. The reservoir is shown at R, in the body of the palette B, and consists simply of a cylindrical cavity filled by a plug, P, so that any water previously poured into it is expelled and rises on to the surface of the palette, where, in the usual way, it is prepared for use by rubbing with the stick of Indian ink or cake of color requisite. After the desired depth of ink, tint, or color is obtained, if left to settle for a short time, the sediment precipitates on the palette, and when the plug is withdrawn, the clear ink or colored fluid flows readily into the reservoir, where it presents a very small proportion of evaporating surface, combined with depth for dipping pens, etc. The cover, C, being put over the palette, the plug may be used to close the orifice, O; or a common marble is dropped on to it, which readily recedes on the insertion of the pen, and settles in its place again on the withdrawal of the pen.



**ELECTRO CHEMICAL COPYING PRESS.**

This press, the invention of Signor Zuccato, of Padua, Italy, differs but little in appearance from an ordinary copying



press, and that difference lies mainly in the construction of the upper and lower beds or surfaces of the press, of which the former consists of a plate of copper, and the latter of a plate of copper tinned, both on mahogany beds—the upper one being attached by lugs or clips to the solid iron press plate, and the lower being made to slide out as shown. These plates are placed in the ordinary way in the circuit of a battery, so that when brought into close proximity by the action of the screw, the circuit is completed and a current established over the whole of the surfaces.

But, by the aid of an insulating medium—a varnish—applied to a steel plate and removable by the action of a "style" in writing, printing, drawing, etching, etc., the electric current is confined to those portions only which are so denuded of the insulating protection; and here it is made to leave record of its passage by its continued action on the steel plate and sheets of copying paper specially prepared and damped with a solution of prussiate of potash. The electrolytic action causes the formation of the ferro prussiate known as the "Prussian blue," producing a perfect facsimile of the original manuscript or design wrought on the varnished surface of the plate.

The battery employed consists of a single cell, with zinc and carbon elements in an actuating solution of bichromate

of potash and sulphuric acid; and its positive and negative poles are connected in the usual way, by spiral coils of insulated wire, with the upper and lower beds of the copying press. The moveable steel plates, on which the writing,

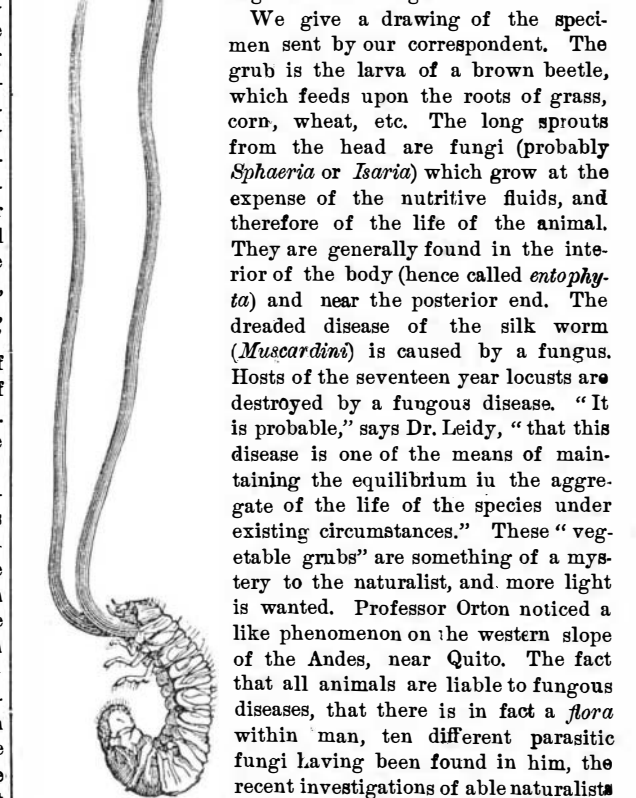
expensive. Compared with macadam, it is believed that where the traffic is heavy, asphalt would prove the cheaper of the two. The effect of temperature does not appear likely to prove injurious in London, unless it be in the case of asphaltes of an inferior character.

The steepest gradient for which asphalt has been used in the city appears to be 1 in 46. There is a pretty good prospect that the extensive trial now being given to various descriptions of paving will demonstrate the question whether we have practically any other choice than granite or macadam. The success of asphalt would be an enormous benefit to the metropolis in the cessation of the wearying roar which accompanies the passage of heavy traffic over paved roads, and in the comparative absence of dust and mud. Horseflesh is also to be considered. M. Leon Malo, a French engineer, has computed that, if all Paris were paved with the Val de Travers compressed asphalt, the saving in wear and tear to horses and carriages would be \$1,700,000 per annum. How far the calculation is correct may be difficult to say; but of the economy of asphalt in its effects on horses and vehicles there can be no question. Its general use is a consummation much to be desired, and the present competition will doubtless tend to reduce the cost of this luxurious improvement in the art of road making. Our only fear is whether it will stand the hard work demanded of it; though it must be remembered that granite often has to be patched and

mended, and what is called "relaying" is a formidable affair.

**Remarkable Parasitic Fungus.**

A correspondent, Mr. A. J. B., of Kansas, sends us a box of specimens and says: Please find herewith what to me is a wonder as well as curiosity, in the shape and character of what is, with us in Kansas, known and called a common grub worm. A bed of them was found and dug up recently while setting posts in this town. The grub when found was just as he now appears, having no life or animation whatever, while the sprout, *quee*, or whatever it is termed, growing from near the head of the grub, was in a growing condition, and full of vegetable life and greenness.



on both sides of the Atlantic, and the lectures of Huxley and Tyndall, invest this subject with deep interest and importance.

**Proposed Government Boiler Experiments.**

Judge Bradley, of the United States Supreme Court, has made a valuable suggestion in his late letter to the Secretary of the Treasury on the subject of steam boiler explosions. He points out the absolute necessity of making a trial of steam boilers, of the size and kind generally used, to find the laws governing explosions and the means of preventing them, and cites the few experiments made at Sandy Hook as showing there is much to be learned by this method of investigation. He recommends Congress to appropriate \$100,000 for the purpose, and to authorize the Government to have a system of experiments made under charge of a board of skillful engineers.

**THE CURRANT WORM.**—A small yellow fly, with brown wings, about the size of the common house fly, deposits its eggs about May 1st. The worms appear about the middle of May. Remedy: Hold a pan under the brush and jar the branches; the worms fall into the pan and are easily destroyed. Repeat the operation as often as necessary. The larvae are supposed to burrow in the earth.

drawing, or other design to be copied, is made, has to be thoroughly cleaned and well and evenly varnished; care also must be taken, by a firm, steady pressure on the style, effectually to remove the varnish, leaving the writing, printing, or other pattern, in bright steel on a raised ground of varnish, affording perfect insulation everywhere else on the surface.

By placing the copying sheets, efficiently damped with the prussiate solution, in any number from one to five or six, one over the other, superimposed on the prepared plate, a corresponding number of copies can be obtained, and so on, almost *ad infinitum*. Thus any required number of copies can be produced with perfect facility and ease—all being facsimiles of the original.—*Mechanics' Magazine*.

**Asphalte Pavements and Roadways.**

This subject is one of very great importance, especially in large towns and cities. The authorities of the city of London are disposed to afford, says the *Engineer*, an extensive trial to the asphalt pavements, at the same time admitting any other mode of paving which appears to offer any advantages. The Commissioners of Sewers have not even discarded wood, but are going to try the American system at a very important junction of streets, where failure would be exceedingly annoying. Trial is also being made of granite pavements jointed with asphalt. The task of providing proper carriage ways for the enormous traffic of London is no small matter. Within one square mile, or thereabouts, there are forty-eight miles of streets. "Of these," says Mr. Heywood, "about nine miles of carriage ways are subject to the largest, most concentrated, and most destructive traffic in the world." The wear from the traffic causes a large consumption of granite annually, and public convenience requires the use of a granite by no means the hardest and most economical. The expense of maintaining the granite carriage ways of the city is very considerable.

The luxury of asphalt paving is undeniable. It is quieter and cleaner than granite, though not quite so quiet as wood. Consequent on the laying of the Val de Travers asphalt, the roar of Cheapside has given place to the mere clatter of horses' hoofs, as if a regiment of cavalry had taken the place of the usual wheel traffic. The change is like the calm after a storm; but the process is at once reversed on quitting the region of asphalt and entering upon the granite roadways. In fact, the asphalt has the effect of a tramway, with the absence also of the grinding sensation which accrues from the flange of the wheel as it travels along the grooved rail. After being down for two or three months, the asphalt has more of a ringing sound than at first, a result which is attributed to the consolidation produced by the weight of the traffic. Being impervious to moisture, the asphalt paving promotes evaporation, and as there are no joints to retain dirt, it is comparatively easy to keep the paving in a state of cleanliness.

Horses falling on asphalt are found to be less injured than if falling on granite, but have more difficulty in getting up again. A little sand, or a horse cloth, removes this disadvantage.

Proper care being taken, by a system of street orderlies, to keep the surface of the asphalt in a state of cleanliness, the use of the watering cart may be dispensed with. This of itself is a great comfort to the public. The sloppy state of the granite carriage ways in summer is a special nuisance, only tolerated because the alternative may be a blinding cloud of dust. With due care, asphalt need have neither dust nor mud.

The durability of the asphalt paving is a question of much importance, and at present can scarcely be answered, though there is reason to hope for a favorable result. This element in the problem materially affects the question of comparative cost as between asphalt and granite. The City Engineer concludes that the durability of asphalt will be less than granite, and in a report presented last year he calculated that, as a general rule, asphalt would be the more