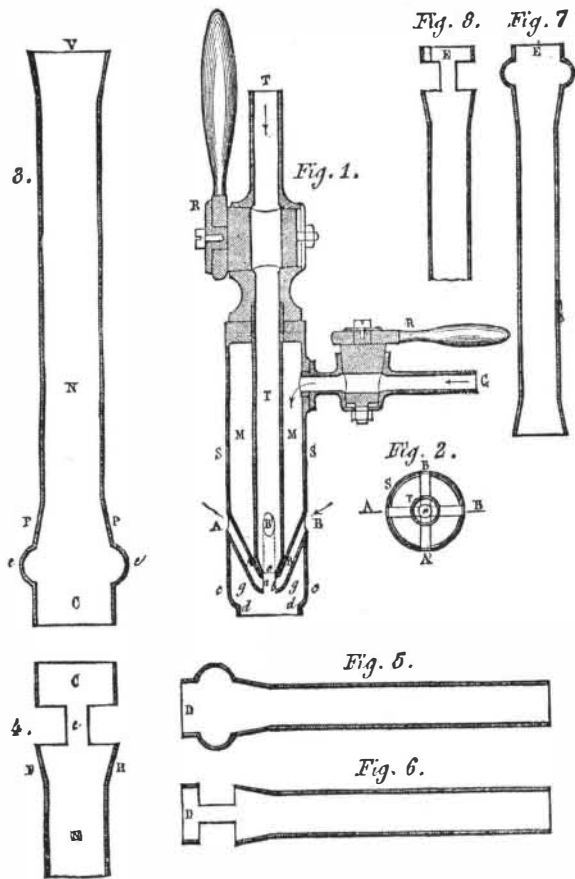


stirred together until the two substances are completely mixed, and then, considerable pressure being exerted upon the pestle, they are rubbed until the resin adheres to the filings in a very fine coating. The filings can then be sprinkled as usual, and the curves formed. It is best (after the curves are formed) to heat the plane surface (glass, paper, or wood, according to convenience) over a stove or in an oven, which easily allows it to be sufficiently as well as uniformly heated. For projecting the curves on a screen, the following, we believe, is a very effective method: Cover the glass with thin gum water, allow it to dry perfectly; obtain the curves on dry gummed surface; finally, breathe on the plate; the gum is thereby softened, and the curve permanently fixed. Substituting correspondingly shaped pieces of paper for the magnets (a pinhole can be used to indicate the north pole), the curves can be covered with a second plate of glass, and thus preserved as an ordinary lantern slide.

A NEW GAS BLOWPIPE.

The apparatus herewith illustrated, in natural size, is a new gas blowpipe burner, designed also for forges and for similar uses where intense heat is necessary. The advantages of the invention are that, when the air blast is supplied by water pressure, it insures the delivery of sufficient air completely to consume all the gas, and in a thoroughly dry state so as not to cool the flame.

The device, as shown, consists of a brass tube, T, to which the air blast is led, and which is screwed in an outer tube, S, which receives the gas from the pipe, G, the gas filling the annular space between the two tubes, and being regulated by the cock, R'. Cock, R', governs the air supply. The orifice, o, of the air tube terminates just within the interior of the tube, S. In order to augment the quantity of air injected into the gas, four copper pipes, A A', B B', are inserted in S, and are so arranged that the current is drawn into that leaving the tube, T, at o, mingling with the latter, and so filling the annular space, g, and escaping at d. A plan view of the tubes, A A', etc., is shown in Fig. 2.



To the orifice, at d, various mouthpieces, some of which are shown in Figs. 3, 7, and 8, may be attached. Each piece consists of a ring, which either slips over or inside of d, and this ring is joined to the main tube, N, Fig. 3, by two thin pieces of metal, e. The openings on the sides thus produced give an additional supply of air, determining a complete mixture within the tube, N, which burns at the exit orifice. A gas lamp under the tube, N, which is disposed laterally, serves to dry the current.

M. Cougnet, the inventor, claims that by this apparatus a very intense heat may be produced at a decreased expenditure of gas, owing to more perfect combustion.

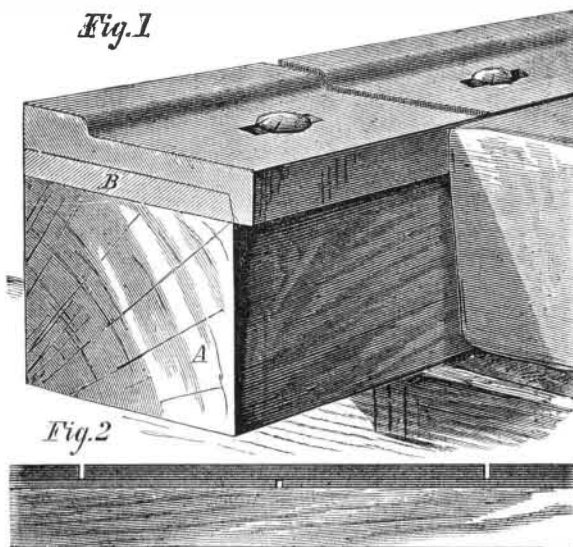
Mr. Thomas Webster, Q. C.

This eminent patent lawyer died suddenly on June 3, at his residence in London, England. On the previous day, he was engaged in the duties of his profession; and was in good health up till late on the day of his death, when he felt fatigued. In the evening, he rose to leave his room, and fell dead in the arms of his servant.

Mr. Webster had for many years held a high reputation for learning and forensic ability at the English bar; and his experience in patent matters, and his wise and strenuous advocacy of a peremptory protection, by all governments, of the rights of inventors, make his death a matter of regret with all who sympathize with progress and the arts and sciences. He visited Vienna in 1873, and was appointed a member of the International Patent Association which held its meetings there; and he expressed to Hon. J. M. Thacher, now United States Commissioner of Patents, who was also a member of the Commission, great admiration for the patent system of this country, and desired that the English practice should be, in its main features, assimilated to it.

NESSLE'S STREET RAILWAY RAIL.

In the invention herewith illustrated, the rails are supported by a continuous line of plates, thus, it is claimed, rendering the track firm and solid, and lessening the expense of repairing. The greatest advantage, however, is that, when the rails become worn out, they can be removed, leaving the plates in their places, when simply new top rails alone need be put down, thus, according to the inventor, decreasing the expense nearly one half.



It is also claimed that the compound rail is stronger than a solid rail of the same thickness, and that, as it has no battering or bending points, the jarring so destructive both to rails and rolling stock is avoided.

A, in the engraving, is the timber ordinarily laid down to form the base for the track. On this is secured a series of flat plates, B, and on top of the plates are laid the rails, in such a manner as to break joints with the under plates. The fastening spikes extend through the rails and plates, securing both, suitable slots allowing of the contraction and expansion of the metal being made for their introduction.

Patented May 4, 1875. For further particulars address the inventor, Mr. John P. Nessle, 23 Frelinghuysen avenue, Newark, N. J.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

For the computations of the following notes (which are approximate only) and for most of the observations, I am indebted to students. M. M.

Positions of Planets for July, 1875.

Mercury.

Mercury cannot be seen in the early part of July, as it rises after the sun, on the 1st at 5h. 27m., and sets at 7h. 45m. P. M. On the 31st, it rises before the sun, at about half past 3, and sets a little after 6 in the evening. It can be best seen on the 27th, when it is at its greatest elongation.

Venus.

On the 1st of July Venus rises at 3h. 2m. A. M., and sets at 5h. 50m. P. M. On the 31st, it rises at 3h. 42m. A. M., and sets at 6h. 30m. P. M.

Mars.

Mars rises, on the 1st of July, at 6h. 50m. P. M., and is easily recognized by its ruddy light. Although very low in altitude, Mars will be very conspicuous all through the month, coming to the meridian at about 11 P. M. early in the month. On the 31st Mars rises at 4h. 37m. P. M., and comes to meridian at 8h. 45m. P. M., at an altitude, in this latitude, of $20\frac{1}{2}^{\circ}$.

Jupiter.

On the 1st, Jupiter rises at 1h. 12m. P. M., and sets a little after midnight. Jupiter rises on the 31st at 11h. 26m. A. M., and sets at 10h. 26m. P. M.

On the 5th of July the second satellite of Jupiter will disappear, by being behind the planet, for nearly three hours (in the evening), while the first is unseen in consequence of being in the shadow of Jupiter. The second satellite comes out from behind the planet, is seen for a few minutes, and then disappears by going into the shadow.

On the 7th, Jupiter, when first seen in the evening, will be without its largest satellite, that moon being behind the planet. On the 14th the same satellite disappears, after 10 P. M., by again going behind the planet.

Saturn.

Saturn rises soon after 10 P. M. on the 1st of July among the small stars of *Aquarius*.

Mars, Jupiter, and Saturn can all be seen in the evening hours throughout the month; when Mars is seen directly south, Jupiter will be seen in the southwest, and Saturn in the southeast.

On the 31st, Saturn rises at 8h. 3m. P. M., and sets a little after 6 the next morning.

Uranus.

Uranus is not in position for observations. It rises in the morning and sets early in the evening all through the month.

Sun Spots.

The report is from May 22 to June 17 inclusive. In the photograph of May 22 no spot is seen. Photography was interrupted by clouds from May 22 to May 27, and from that date till June 2 no spots were observed. In the picture of June 2, two small spots appeared coming on, and the pictures of June 4 and 5 show the regular motion of this group

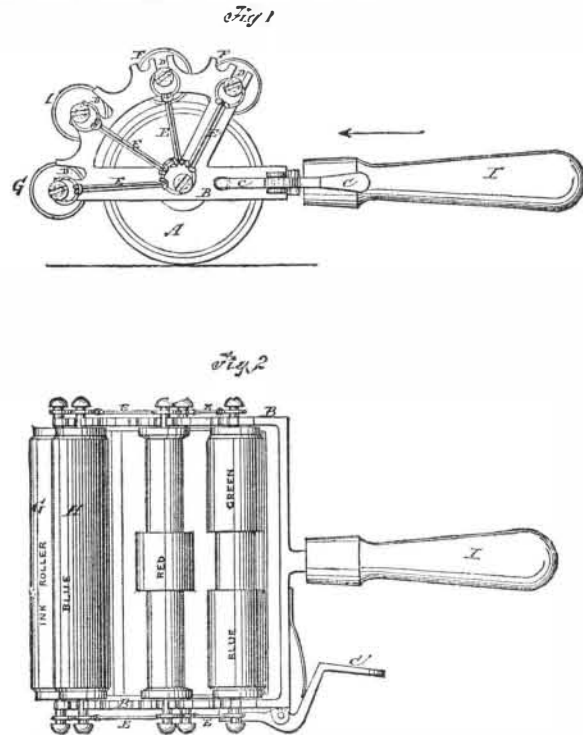
across the disk, on account of the sun's motion on its axis. On June 7 one of these spots was seen to be much smaller, and in the next picture, June 10, it had disappeared. The other did not appear to change, and was last seen, June 11, on the very edge. In the photographs of June 12, 14, and 15, no spots are observed. The picture of June 16 shows a group of spots on the eastern limb, which do not appear on the picture of the previous day, and the photograph of today, June 17, shows the motion to be regular. For a month past the spots have been very few and small.

Another Steam Horse.

Mr. Fortin Hermann, says *Les Mondes*, is testing a machine which is moved by articulated feet which are successively planted upon the ground. Two feet act from the front body and two from the rear, being pressed downward by steam, which besides, in a horizontal engine, oscillates rods which, acting upon the feet, cause the apparatus to drag itself along. From experiments cited, it appears that the feet, when shod with rubber and charged with a weight of 22 lbs. per 0.4 inch, indicated an adhesion equal to 0.75 of the weight of the motive machine. The apparatus travels at the rate of from 4 to 48 miles per hour; and by a new arrangement, in which one pair of feet trot while the other pair amble, it is expected to run at the rate of 12 miles. It will ascend grades of 1 in 10 with quite heavy loads.

BALDWIN'S ROTARY HAND STAMP.

Mr. Charles E. Baldwin, of New York city, has patented a hand stamp by which the operator is enabled to print any number of colors at one time by a single movement across the paper. In Fig. 1, in the engraving, A represents a cylinder, on which the type is set. The said cylinder has its bearings in the arms of the frame, B, and is held from making more than one revolution by the spring catch, C, which strikes against a pin or lug on the cylinder end. The ink and color rollers rest in slots, D, on the arc, forming bearings for them to revolve in, and are held in such a position by elastic bands, E, attached to rings slipped over their ends, and to a ring set over each end of the type cylinder journals, as shown in Fig. 1. F F F F represent notches or rests, into which such rollers as are not required to be used are lifted, so as to clear them from the type cylinder.



The engraving represents the device ready for printing in blue, red, and green, and showing the other rollers lifted out of connection with the type. When it is desired to print in black or any single color, it will be necessary to use a single roller, as G or H, and raise all the others off the type cylinder into their respective rests, F. The rollers are wrapped with flannel or its equivalent, so as to absorb a sufficient amount of coloring material to feed the type uniformly.

How can the Grasshoppers be Utilized?

The Minnesota State authorities have hit upon a way of clearing the four counties to which the grasshoppers have confined their ravages, which certainly deserves credit. It is praiseworthy for several reasons, for it has set the people inventing, provided them with lucrative work at a time when the destruction of their crops threatened to cut off all income, and actually put the grasshopper at a premium. The plan is simply to buy the grasshoppers from the farmers at ten cents a quart. The people have fairly jumped at the offer, and it is said that, in every town in the four counties, wagon load after wagon load of the hoppers is arriving, until now the pest is almost exterminated. In one county 1,000 bushels were paid for, and this was one day's catch. One farmer made \$55 for the labor of his family for twenty-four hours. Another has driven parties off his farm with a pitchfork since the bounty system has been adopted, claiming the grasshoppers as his, and that he alone had a right to catch them. Still another individual, of a pious turn of mind, who refused to aid in burning the hoppers, on the ground that they were a dispensation of Providence and should not be interfered with, as soon as the reward was offered set his entire family to work, and added his own labor all day Sunday, making a nice sum by his endeavors.

Several ingenious traps have appeared, propelled by horse