

## Science and Art.

## History of Reaping Machines.—No. 20.

On the 1st of July, 1851, A. Palmer and S. G. Williams, of Brockport, N. Y., obtained a patent, the claim of which, on page 342, Vol. 6, SCIENTIFIC AMERICAN, is as follows: "discharging the cut stalks and heads of grain from the platform by means of the combination of the rake with the lever, and the co-operation therewith of the series of teeth on the face of the wheel, and the inclined rail rising above the curved guard of the platform." The object of the invention relates to self raking.

On the 8th of July following a patent was granted to Wm. Jones, of Bradford, Vt., for a rotating cutter. See claim, page 350, Vol. 6, SCIENTIFIC AMERICAN.

On the same date a patent was granted to Wm. H. Seymour, of Brockport, for an improvement in self-acting rake. See claim on same page.

On the 15th following a patent was granted to Sylvanus Miller, of Urbana, Ohio, for an improvement in harvester rakes also. See claim, page 358, Vol. 6, SCIENTIFIC AMERICAN. This patent was assigned to Palmer & Williams on the 21st November, 1854. The following is the part of Miller's claim which is applied by the assignees to their machines, viz., "the application of a thin light roof to the rakes for harvesters, for the purpose of effecting the separation of the gavel from the falling grain."

On the 23rd September, 1851, a patent was granted to John H. Manny, of Waddams Grove, Ill., for a method of hinging the cutter bar to the side of a triangular frame, to prevent the ends of it from sagging. See claim, page 22, Vol. 7, SCIENTIFIC AMERICAN.

On page 54, same volume, is the claim for the re-issued patent of W. F. Ketchum, of Buffalo, N. Y.

As there is much diversity of opinion respecting who is the inventor or inventors of certain parts of reaping machines, we deem it our duty to publish as much fair information on these subjects as we can obtain. The following is another important letter from a correspondent in relation to the controverted question, "who is the inventor of the zig-zag sickle:"—

CORRECTION No. 2.—In No. 20 of the SCIENTIFIC AMERICAN, I see a letter of Messrs. Seymour & Morgan, in which they say that Moore & Hascall are entitled to the credit of the invention of the zig-zag sickle." I was of the same opinion until last spring, when a couple of gentlemen from Michigan, and neighbors of Mr. Moore's, informed me that John Leland was the inventor and maker of the first zig zag sickle used by Moore & Hascall in their sixteen horse reaper, in 1838. The names of these witnesses and others I can procure if the question should become of sufficient importance to "justify," as the Suckers say. The zig-zag sickle is the main and probably only important device sought to be secured by Mr. Moore, in his curious bill that has been pending in Congress two or three years. I became acquainted with Mr. Moore in Washington two years ago, and was much interested in his favor.

I hope Congress will dispose of the subject of patent extension at once. Not one of these applicants have a right to what they claim, nor has Congress power by the Constitution to grant what they ask, and the country should not be kept in a state of alarm at the threatened wrong. HENRY GREEN.

Ottawa, Ill., Feb. 6, 1855.

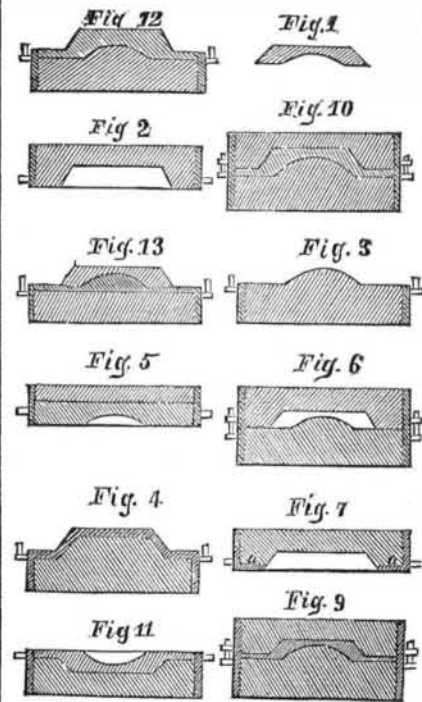
## Copper Smelting in Tennessee.

It is said that a project is now on foot to establish works for smelting copper ore at Chattanooga, Tenn., to accommodate the rapidly increasing mining interests of East Tennessee and North-Western Georgia. The intention is said to be to do away with the general practice of shipping ore to Baltimore, which has hitherto been considered a matter of necessity.

## Improvements in Molding.

Every improvement in molding is of vast importance to a very large class of our people. We do not know any branch of business that is more universally spread throughout the length and breadth of our land. Every improvement, therefore, in this art, wherever invented, when we can do so in a proper manner, we endeavor to present to our readers.

The annexed engravings illustrate an improvement in molds for casting metals, for which a patent was granted to John and Robert Jobson, iron founders, England, and published in the last number of the last volume (45) of that excellent work, *Newton's London Journal*:



"In molding, according to this invention, a pattern of the article to be cast is prepared, which may be of iron, wood, or other suitable material. Thus, if it be required to prepare molds for the casting of a plate of the sectional form shown at fig. 1, a pattern is prepared, and two molds are made from the same, in sand or plaster of Paris, or other suitable material, which will present the forms shown in figs. 2 and 3. An empty molding box is then placed on the mold, fig. 2, and an alloy of lead and tin, or zinc and tin, or other suitable metal or alloy of metals, is poured in, until the mold is covered thereby. When the plate deviates considerably from a flat surface, a core or cores of sand or other suitable material may be introduced at parts, so as to displace a portion of the fluid metal, and render a less quantity of the same sufficient to cover the mold. Pins or screws, or other projecting pieces, attached or not to the molding-box, as may be most convenient, are introduced into the metal, and when it has solidified, the box is filled with Roman cement or other suitable material, so as to form a ramming-block with a metallic face or surface, fig. 4; or the blocks may be made entirely of metal or alloys of metal. Another ramming-block, fig. 5, is made in a similar manner from the mold, fig. 3. A molding-box is placed on each of these ramming-blocks, and sand or loam is rammed in, and the two sand molds thus made are placed together, as in fig. 6, to form the complete mold for receiving the melted iron or other metal, suitable passages being left in the sand for the purpose. The frames or boxes are provided with pins and holes which fit corresponding holes and pins in each other, and in the ramming-blocks.

Instead of introducing cores to displace a portion of the metal, as above mentioned, an additional pair of molds, of sand or other suitable material, are sometimes prepared, as shown at figs. 7 and 8, from the original pattern, and a portion of the sand is scraped away, as shown by the lines, *a a* and *b b*.—These molds are then placed in contact respectively with the molds, figs. 3 and 2, as shown in figs. 9 and 10, and the alloy of lead and tin, or other metal or alloy of metal, is poured into the same, through suitable passages made in the sand or other material for

that purpose. The plates thus made—when backed with Roman cement or other suitable material, after taking out the sand, but before the boxes have been separated or the plates displaced—form the ramming-blocks shown in figs. 11 and 12, which are employed in a similar manner to those shown in figs. 4 and 5.

It will be seen that the partings of the sand, or the surfaces of the sand which come in contact with each other in the complete mold, fig. 6, as well as the mold of the article itself, are thus molded on metallic surfaces. The molds are thus made with great accuracy, and also with great facility, as the molder's skill is not required to produce a good parting.

In lieu of pouring melted metal into the mold to form the face of the ramming-block, an empty box is sometimes fixed upon the mold, figs. 2 or 3 (which for this purpose, may be of plaster of Paris); and this box is luted on in a water-tight manner, and filled with a solution of sulphate of copper, or other suitable metallic solution, and the copper or other metal, or mixture of metals, is deposited on the surface of the mold by means of the electrotype process. The mold is previously prepared with wax, or other suitable material, to prevent it from absorbing or being acted upon by the metallic solution; and it is rendered capable of conducting electricity by means of black-lead or other suitable conducting material, as is well understood. When a sufficient coating of copper or other metal has been thus deposited, the solution is removed, and the plate backed, if necessary, with lead and tin or other suitable metal or alloy of metals, and the box filled up with Roman cement, or other suitable material. Screws or pins, or pieces of metal, are placed on the surface while the metal is depositing; and these pieces of metal become attached to the deposit, and serve to connect it firmly to the cement backing. The ramming-blocks thus made are similar to those shown in figs. 4 and 5, and are employed for forming the sand molds in a similar manner.

If a box of iron or other material, capable of being injuriously acted upon by the sulphate of copper or other metallic solution, is employed, it is to be coated with grease on the inside, or otherwise protected from the action of the solution. A wooden box, lined with pitch or with gutta percha, may be employed while the metal is being deposited; and this box may be removed and replaced by an iron box when the deposit has acquired a sufficient thickness, and the iron box is then filled up with the backing, as hereinbefore described.

The patentees also prepare ramming-blocks consisting of lead and tin or other metals, or partly of metal and partly of Roman cement or other suitable backing, and having the original pattern attached to one of such ramming-block, in a similar manner to that described in the specification of Mr. John Jobson, patent dated October 2nd, 1852. In this mode of proceeding, the two molds, figs. 2 and 3, are made from an iron or metal pattern, fig. 1. This pattern is then laid on the mold, fig. 2, after attaching some hooks to its back, and an empty box is placed over it, and an alloy of lead or tin, or zinc and tin, or other suitable metal or alloy of metals, is poured into the box so as to cover the pattern. Hooks or pins are placed in the liquid metal, and when it has cooled, the box is filled with Roman cement or other suitable backing. The ramming-block, fig. 13, is thus produced. Or the box may be completely filled with the melted metal if preferred. The other ramming-block is made as above described, or as described in the specification before referred to, by making a reverse mold in plaster or sand, from the mold, fig. 3, and again taking a cast from this reverse mold in cement, which will then produce a ramming-block of the form shown in fig. 3."

## Polishing Slate

Dr. Benj. Workman, in a letter read before the Natural History Society, of Montreal, mentions that a process has been recently discovered by which slate may be rendered

white in color, and made to take a polish like alabaster or Carracca marble. This transformation is produced by the use of certain chemicals and the application of friction.

## Important Discovery.

A paper states that Dr. Griseler, a French gentleman, has discovered that by adding a few drops of nitric ether to the most rancid oils, all the disagreeable smell is removed, and that by afterwards warming the oil, to separate the spirit from it, it becomes as clear and as limpid as though it had never been otherwise than sweet. He says that a few drops of ether in a bottle of oil will prevent it from ever becoming rancid.

## LITERARY NOTICES.

ANNUAL OF SCIENTIFIC DISCOVERY FOR 1855.—The above named work, edited by Prof. D. A. Wells, and published by Gould & Lincoln, Boston, has been issued since the last No. of the Sci. Am. was published; it is embellished with a fine steel plate of Lieut. Maury, and contains about 400 pages of closely printed matter, embracing, in a condensed form, the principal discoveries that were made during the past year, in the Arts and Sciences. A large and interesting chapter is devoted to mechanics and useful arts; another to natural philosophy; the third to chemistry; the fourth to geology; the fifth to botany; the sixth to zoology, and the seventh and eighth are devoted to astronomy and geography. It is literally packed with useful information, selected with great care; quite a number of articles are from the columns of the Sci. Am., and honorable credit given. It should meet with an extensive patronage, for it is worthy and does great credit to its author.

WEALTHY CITIZENS OF NEW YORK CITY.—M. S. Beach, Esq., proprietor of the Sun newspaper, has just issued the twelfth edition of the Wealth, and Biography of the Wealthy Citizens of this city. It is an interesting pamphlet of about 100 pages, containing the names of nearly all the citizens of this Metropolis, whose wealth is estimated at one hundred thousand dollars and upwards, with a short biography of most of them, in which is related the manner and kind of business pursued by which their wealth has been amassed; looking over its pages it is surprising to see what a majority of the wealthy men of this city have made their own fortunes—how few of the number, comparatively, are indebted to their ancestors for their present wealth and position.—Price of the book, 25 cents. Address M. S. Beach, Sun Office, New York.

MASSACHUSETTS MECHANICS CHARITABLE ASSOCIATION.—We have received a copy of the Annals of the Massachusetts Mechanics Charitable Association, compiled by the venerable Joseph T. Buckingham, of Cambridge. It is a very interesting work; every mechanic in Massachusetts should have a copy of it. The Association has been in existence sixty years, and is now in a flourishing condition. It is ornamented with steel plate likenesses of Paul Revere, J. T. Buckingham, and Benjamin Russell.

MAP OF CALIFORNIA MINES.—We have received from M. Milneson, C. E., of San Francisco, his improved topographical map of the Northern and Middle Mines of California, and showing a practical route for the Atlantic and Pacific Railroad through the Sierra Nevada at Freduoy's Pass. It is a very useful map and does credit to its author, and to Alex. Zakreski, who lithographed and published it.



## Inventors, and Manufacturers

The Tenth Volume of the SCIENTIFIC AMERICAN commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

Its general contents embrace notices of the LATEST AND BEST SCIENTIFIC, MECHANICAL, CHEMICAL, AND AGRICULTURAL DISCOVERIES, with Editorial comments explaining their application; notices of NEW PROCESSES in all branches of Manufactures; PRACTICAL HINTS on Machinery; information as to STEAM, and all processes to which it is applicable; also Mining, Millwrighting, Dyeing, and all arts involving CHEMICAL SCIENCE; Engineering, Architecture; comprehensive SCIENTIFIC MEMORANDA; Proceedings of Scientific Bodies; Accounts of Exhibitions,—together with news and information upon THOUSANDS OF OTHER SUBJECTS.

Reports of U. S. PATENTS granted are also published every week, including OFFICIAL COPIES of all the PATENT CLAIMS; these Claims are published in the Scientific American in ADVANCE OF ALL OTHER PAPERS.

The CONTRIBUTORS to the Scientific American are among the MOST EMINENT scientific and practical men of the times. The Editorial Department is universally acknowledged to be conducted with GREAT ABILITY, and to be distinguished, not only for the excellence and truthfulness of its discussions, but for the fearlessness with which errors are combated and false theories are exploded.

Mechanics, Inventors, Engineers, Chemists, Manufacturers, Agriculturists, and PEOPLE IN EVERY PROFESSION IN LIFE, will find the SCIENTIFIC AMERICAN to be of great value in their respective callings. Its counsels and suggestions will save them HUNDREDS OF DOLLARS annually, besides affording them a continual source of knowledge, the experience of which is beyond pecuniary estimate.

The SCIENTIFIC AMERICAN is published once a week; every number contains eight large quarto pages, forming annually a complete and splendid volume, illustrated with SEVERAL HUNDRED ORIGINAL ENGRAVINGS.

## TERMS! TERMS!! TERMS

|                                  |      |
|----------------------------------|------|
| One Copy, for One Year           | \$2  |
| "    Six Months                  | \$1  |
| Five Copies, for Six Months      | \$4  |
| Ten Copies for Six Months        | \$8  |
| Ten Copies, for Twelve Months    | \$15 |
| Fifteen Copies for Twelve Months | \$22 |
| Twenty Copies for Twelve Months  | \$28 |

Southern, Western, and Canada Money taken at par for Subscriptions, or Post Office Stamps taken at their par value. Letters should be directed (post-paid) to  
MUNN & CO.  
128 Fulton street, New York.