

higher than 1,000° Fah. "Montrose stone," from Ulster county, N. Y., is one of those which stood the test of 1,000°. These investigations were made at the instance of the *Underwriter*.

AGRICULTURAL INVENTIONS.

An improved seed planting machine, patented by Mr. Albert Dart, of Richmond, Va., consists in combining with a seed dropper mechanism a flat rimmed wheel and rim grooved roll, and in arranging a supporting wheel on a two-part shaft between the two sections of a seeder.

An improvement in the class of cotton choppers having one or more hoes operated by a crank or similar means, and working across the rows of plants, or at right angles to the direction in which the machine advances, has been patented by Mr. John T. Sustaie, of Matthews, N. C.

Mr. Benjamin M. Watts, of Phoenix, Arizona Ter., has patented a portable baling press, which is so constructed as to be moved from place to place about a field in which hay has been cut, and bale the hay as it lies in the windrows, where it has been left by the rakes. There is no necessity of bringing the hay to the press or transporting and stacking a quantity in one place, so as to save moving the press. This is the prime or paramount object of the invention, the peculiar combination and construction being such that these results are obtained by the minimum of expenditure of time, labor, and money.

Mr. Robert L. Turner, of Olena, Ohio, has patented an improved hand hoe of that form in which a short handle carries a bent blade adapted to universal use in the cutting away of grass or manipulating the soil about plants; and it consists in the peculiar form of the blade, which is constructed of a main body portion setting off to one side of the longitudinal axis of the handle in a parallel plane therewith, and a curved or upturned end portion, which, as well as the main portion, is sharp upon both edges.

Mr. George Metcalf, of Lelend, Ill., has patented a cheap and simple machine for grinding feed for cattle, horses, etc., that is designed more particularly to be operated by windmills having a crank motion.

Mr. Samuel Huber, of Danville, Pa., has patented a plow colter to be attached to the inner or furrow face of the plow beam in such a manner that the colter shall cut the grass from the edge of the turf that is to be turned over by the plow, so that the grass shall not protrude upward between the turned furrows.

Alisoff's Copying Process.

Instead of using a tray filled with a compound to receive the ink, M. Alisoff employs sheets of prepared paper. This polygraphic paper is prepared in the following manner: Sized or unsized paper is coated on one side with a composition consisting of glue, or gelatine, glycerine, soap, and water, approximately in the following proportions, which have been found to give good results in practice: 80 pounds animal glue or gelatine, 20 pounds glycerine, 20 pounds soap, 200 pounds water.

The paper thus prepared may occasionally be found to be too sticky for use, which will depend on the surrounding temperature and the quality of the materials employed. To obviate this objection wash the prepared paper with a solution of alum, the strength of which can only be determined by experiments in each case. The "polygraphic paper" may be of different thicknesses, and if not transparent may be made so, if desired, by any of the ordinary and well known means. The aniline ink, found to give the best results for written documents, is prepared by preference by dissolving about 1 pound of aniline of commerce in about 1½ pounds of alcohol, and adding thereto, when dissolved, as much water as is necessary to render it sufficiently fluid. It may then be bottled for use.

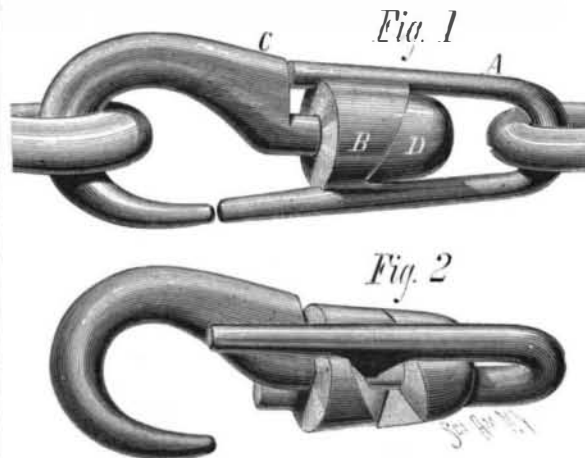
In producing the "matrix" the patentee takes a sheet of prepared or "polygraphic" paper, and lays it on a sheet of damp flannel or cloth placed upon a zinc plate or an oil paper. He sponges it with clean water, or, in hot weather, with water containing a little alum, and places the dry original upon the prepared paper. Over that he places another piece of damp flannel zinc, or oil paper, and puts the whole pile into an ordinary copying press. A good matrix can be obtained by mere pressure of the hands without a press, although a press is preferable. The text must be written, drawn, or printed with aniline ink, taking care that the pen be quite clean and always full of ink. The ink when dry ought to shine like a metallic surface. In taking copies from the "matrix" after having detached the original therefrom, the patentee places a sheet of ordinary paper in the place of the original, and proceeds in the same way as when producing the matrix; but if copies or "matrices" are to be taken from 2, 4, 6, or 8 pages at once he places a sheet of damped "polygraphic paper" on each page with damp flannels and zinc sheets between the leaves of "polygraphic paper," and proceeds in the way above described.

The polygraphic paper may be bound into copying books which can be used like ordinary copying books made of tissue paper, and copies on ordinary paper may be taken from the "matrices" thus preserved, even after a considerable time. After a few copies have been taken the written text can be read from the reverse side of the "matrix," as in ordinary copying books. Should it be found desirable to obtain manifold copies of printed matter this may be accomplished by employing in combination with "polygraphic" or prepared paper, aniline printing ink, prepared in the fol-

lowing manner: Take equal parts by weight of aniline and glycerine and boil them together till the aniline is dissolved, and the composition has attained sufficient consistency to be used in the manner of printer's ink. Ink so prepared will be found particularly useful for printing the headings of letters, bills of lading, declarations, letters of invitation, circulars, and other documents containing both written and printed matter, since if aniline ink be used for both the printing and writing the copies will contain both the printed and written matter, while heretofore only the writing could be copied, the printing ink hitherto employed not being transferable.

NEW SELF-LOCKING HOOK.

We give herewith an engraving of an improved self-locking hook recently patented by Mr. Joel R. Haines, of Mount Laurel, N. J. These hooks are so constructed that the weight of traces or any other tension or strain will hold them securely locked, so that they cannot accidentally become unhooked.



HAINES' SELF-LOCKING HOOK.

Fig. 1 shows the hook in its normal condition, and Fig. 2 represents it as unfastened.

The two arms of the loop, A, are connected by a collar, B, having on one of its sides two ratchet or clutch teeth, which are engaged by two similar teeth on the head, D, on the shank of the hook, C.

The shank is capable of turning in the collar, B, and as it is turned it is retracted by the action of the inclined faces of the ratchet teeth on the collars, D B, and when strain is put on the hook the tendency of these inclined faces is to turn the hook in the opposite direction.

The ends of the loop, A, are elongated so as to project beyond the collar, B, one arm projecting far enough to nearly touch the point of the hook when locked; the other arm nearly touches the shoulder at C.

Any longitudinal strain tends to keep the hook fastened, and it can be unfastened only by relieving it from strain. This device is applicable not only to harness, but to all kinds of rigging and tackle employing ropes, chains, or straps.

All communications in relation to this invention should be addressed to Mr. Louis T. Drouse, Camden, N. J.

NEW REFRIGERATING COVER.

The annexed engraving represents an improved refrigerating cover recently patented by Mr. Abijah North, of



NORTH'S REFRIGERATING COVER.

Champlain, Clinton County, N. Y. It is designed to be placed over victuals or over dishes containing them, and may be made so small and compact that it may be conveniently used on the table for cooling butter and other articles.

The invention consists of a can having in its lower portion an annular chamber, A, upon which rests a pan, B,

which does not quite cover it, and in the pan is placed a basin of perforated metal or wire cloth for containing the ice. The entire device is closed by a cover at the top, and made airtight or nearly so at the bottom by a ring of rubber tubing that surrounds the lower edge of the annular chamber, A. As the ice melts in the basin, C, the water drops into the pan, B, from which it runs into the annular chamber, A. The chamber is provided with a small outlet for air, and with a faucet for drawing off the water accumulating in it.

This refrigerating cover may be placed over small dishes or over articles contained by larger dishes, as shown in the engraving. It will be noticed that both the ice and the ice-cold water resulting from the melting of the ice are utilized in refrigeration.

Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although merely approximate, they will enable the observer to recognize the planets. M. M.

POSITIONS OF PLANETS FOR JUNE, 1880.

Mercury.

On June 1 Mercury rises at 4h. 26m. A.M., and sets at 7h. 21m. P.M.

Mercury is approaching its greatest eastern elongation, and should be looked for after the 15th of the month, in the evening twilight, about 2° north of the point of sunset.

On June 30 Mercury rises at 6h. 34m. A.M., and sets at 9h. 7m. P.M.

Venus.

Venus is approaching superior conjunction, and is so nearly in range with the sun that it is not likely to be seen during June.

Mars.

Mars is more and more distant from us; but its reddish light enables one to distinguish it from the stars.

On June 1 Mars sets at 10h. 50m. P.M.

Mars will be seen near the new moon on the 11th; the moon will pass east of Mars and below the planet in altitude.

Jupiter.

On June 1 Jupiter rises at 1h. 53m. A.M.

It is near the waning moon on the morning of June 2.

On June 30 Jupiter rises at 0h. 10m.

It is in conjunction with the moon; the moon passes north of the planet. This planet is now near enough for us to examine the changes of its satellites.

On the morning of June 23, between 2 and 4, the first satellite and its shadow may be seen on the disk of Jupiter.

Saturn.

On June 1 Saturn rises at 2h. 28m. A.M.

Saturn passes the star Omicron Piscium on the 7th. The star is one degree further north in declination.

On June 30 Saturn rises at 0h. 40m. A.M., closely following Jupiter, about three degrees further north.

Uranus.

Uranus rises on June 1 at 11h. 8m. A.M., and sets at 23m. after midnight.

On June 30 Uranus rises at 9h. 18m. A.M., and sets at 10h. 31m. P.M.

Uranus is moving away from the star Rho Leonis in right ascension, and approaching it in declination. It is about one degree east of the star.

A telescope of four inches aperture will show that Uranus has a pale greenish-white disk; it appears like a very small full moon.

Sun Spots.

The long period of quiet on the sun's surface has ended. The spots follow one another now in rapid succession. A group composed of some dozen spots was approaching the western limb of the sun late in April, when there entered upon the eastern limb a large and densely black spot, surrounded by the usual gray bordering, and accompanied by several others smaller in size. This is undoubtedly a return of that seen about the middle of April; the different members so numerous at that time seem to have united. This spot should be looked for early in June.

Hydraulic Mining on a Railway.

Recently heavy slides of earth seriously obstructed the track of the Central Pacific Railway above Alta, California. The mass of earth to be removed was so great that by ordinary methods several weeks would have been required to clear it away. In the emergency hydraulic miners were called upon for help. They brought up their pipes and monitors, constructed a flume from a ditch which was, fortunately, near at hand, and in fourteen hours piped away a body of debris which had been the despair of picks and shovels. The tremendous power of hydraulic mining was thus exhibited in a very practical way. Those who witnessed the swift dispatch of this avalanche of earth have attained, says the *Sacramento Union*, a lively perception of the effects produced upon the bluffs which contain the gravel deposits. It is, indeed, somewhat singular, the *Union* continues, that the hydraulic monitor has never been used in making cuts on railways where the soil is sufficiently soft to be piped. It might be thought that in such cases there would be great economy in the application of water power, for a strong head of water directed by an experienced hand will cut out and carry away more dirt in one day than fifty men could shove and pick in a week.