HYMER'S COAL CABINET.

The annexed engravings represent a new box or cabinet designed for holding coal. It will contain from 5 to 20 bushels, and has the advantages of screening the slack from the lump coal, depositing the former in a drawer for covering

Fig. 1.

fires at night. It also retains all dust, and thus prevents the same from soiling carpets.

Fig. 1 shows the device closed, and in Fig. 2 portions are broken away to exhibit the interior construction.

Fig. 2.

The coal is inserted through the door above and falls upon a feed hopper, its weight bearing upon the latter and wedging it the more tightly in place. After passing through the hopper the coal falls upon the grate shown, through the bars of which the dust and slack drop into the drawer below, whence they may be easily removed. In case lump coal is used the grate may be removed and a solid bottom substituted.

The device can be made to fit any corner or opening and to match any furniture or covering. Patented July 24, 1877. For further particulars address the inventor, Mr. Christopher Hymers, 1601 Monroe street, St. Louis, Mo.

Volcanic Signs in Nebraska.

The seat of disturbance is on the banks of the Missouri, in Dixon county, about thirty-six miles from Sioux City. A bluff, about 1,000 feet long and 160 feet high, sloping at an angle of 60° to 80° toward the river, is at present the place where the phenomena are most exhibited, but other bluffs at a few miles' distance have been similarly affected. Two years ago a portion of this bluff, half as large as what is left, broke away and fell partly into the river. On the bluff sounds were heard proceeding from the interior, especially on placing the ear to the ground. Flames sometimes broke forth, occasionally at night. Steam escaped from crevices. On digging into the bluff, intense heat stopped the work after proceeding a few feet. Selenite, alum, and magnesia sulphate in crystals were abundant. Professor Augheyregards these features as not volcanic in the usual sense of the term, but simply the result of local chemical action. The formation is cretaceous. The bluff is capped by calcic carbonate. Beneath are shales containing ferric bisulphide in crystals or pyrites. Below the shale is a soft limestone, containing carbonates of magnesia and alumina. The chemical reactions consequent upon part of the soil being soaked with water after its fall toward the river, have been the decomposition of the pyrites, the production of sulphuric acid, and the attack of the acid on the alkaline carbonates. The heat evolved in the first of these reactions is, of course, very great; in the latter part the violence of the performance must be increased by the liberation of carbonic anhydride. All the authenticated disturbances are thus easily explained. Professor Aughey does not connect them with the earthquake. He thinks the bluff might furnish alum and other salts in quantities sufficient for profitable manufacture.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

The computations of the following notes are prepared by students in the Astronomical Department of Vassar College. They are approximate only, but sufficiently accurate to enable ordinary observers to find the planets.

Position of Planets for January 1878.

Mercury.

Mercury may be seen in the evening twilight during the first week in January. It rises on January 1 at 8h. 32m. A.M., and sets a few minutes before 6 P.M., about 3° north of the point of sunset. On January 31, Mercury rises at 5h. 49m. A.M., and sets at 3h. 7m. P.M. In the latter part of the month it should be looked for before sunrise.

Venus.

On January 1, Venus rises at 9h. 59m. A.M., and sets at 8h. 23m. P.M. On the 31st, Venus rises at 8h. 7m. A.M., and sets at 7h. 47m. P.M.

Venus will be very brilliant all through January, and at the greatest brilliancy on the 16th. It passes the meridian on that day a little before 3 P.M. at an altitude of about 41° (in this latitude) and can be seen with the eye. Venus passes near the moon on the 7th.

Mars.

Mars, although smaller than in the autumn, is still a striking object in the evening skies. On January 1, Mars rises at 11h. 41m. A.M., and sets at 19m. after midnight. On the 31st, Mars rises at 10h. 24m. A.M., and sets at 11h. 54m. P.M.

Jupiter.

Jupiter's daily path lies so nearly with the sun's that it will not be seen in the early part of January. In the last week of January it may be seen before sunrise. On the 31st, Jupiter rises at 6h. 13m. A.M., and sets at 3h. 25m. P.M.

Saturn.

Saturn, although so small as seen by the eye, is still the most interesting object to astronomers. The ring which is so beautiful when seen obliquely is now (seen almost in its plane) narrowing steadily, and with a small glass seems little more than a bright line across the ball of the planet.

Titan, the largest of Saturn's moons, can be seen with an ordinary telescope. It goes around Saturn in about sixteen days; and as on December 12 it was far on the left of Saturn (as seen in the telescope), it will have made one revolution and be on the right of Saturn by January 1.

On January 1, Saturn rises at 10h. 51m. A.M., and sets at 9h. 56m. P.M. On January 31, Saturn rises at 8h. 59m. A.M., and sets at 8h. 13m. P.M.

Uranus.

On January 1, Uranus rises at 8h. 33m. P.M., and sets at 10h. 5m. A.M. of the next day. On the 31st, Uranus rises at 6h. 30m. P.M., and sets at 8h. 4m. the next morning.

Uranus follows, by a few minutes of right ascension, the bright star Regulus, and is on nearly the same parallel of declination.

Neptune.

Neptune rises a little before 1 o'clock January 1, in the afternoon, and sets a few minutes after 2 on the morning of January 2. On January 31, Neptune rises at 10h. 47m. A.M., and sets at 10m. after midnight.

Astronomical Notes.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, January 5, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated.

PLANETS.

Mercury sets	5 42	evening
Venus "	8 27	"
Mars in meridian	5 53	"
" sets	0 18	morning
Jupiter "	4 41	evening
Saturn in meridian	4 9	"
" sets	9 43	"
Uranus rises	8 20	"
Neptune in meridian	7 11	"
" sets	1 55	"

FIRST MAGNITUDE STARS.

Sirius rises	6 37	evening
Procyon "	6 12	"
Spica "	0 57	morning
Regulus "	8 16	evening
Vega sets	8 26	"
Altair "	7 13	"
Fomalhaut sets	7 50	"
Capella in meridian	10 5	"
7 stars (cluster) "	8 38	"
Aldebaran in meridian	9 27	"
Betelgeuse "	10 46	"
Algol in meridian var.	7 55	"

REMARKS.

Mercury is nearly invisible, setting 1h. after the sun. Venus is in *Aquarius*, and directly south 10° of the X-shaped figure composed of three stars of the third magnitude and one of the fourth. Mars is in a cluster of fourth and fifth magnitude stars in *Pisces*. He was at his eastern quadrature January 4. Jupiter is invisible, setting with the sun. Saturn is in *Aquarius*, east of Venus about 15°. He is an object of considerable interest at present, owing to the fact that his rings soon disappear. This event transpired last in 1861. The sun is ½° and the earth 2¾° above the plane of the rings. Hence the northern surface is illuminated, and that surface is presented so very obliquely that the rings are quite invisible with small telescopes, and through more powerful ones appear like two handles projecting from opposite limbs of his disk. Uranus rises at 4m. later, and is 4′ or 1° east of Regulus, having the same declination.

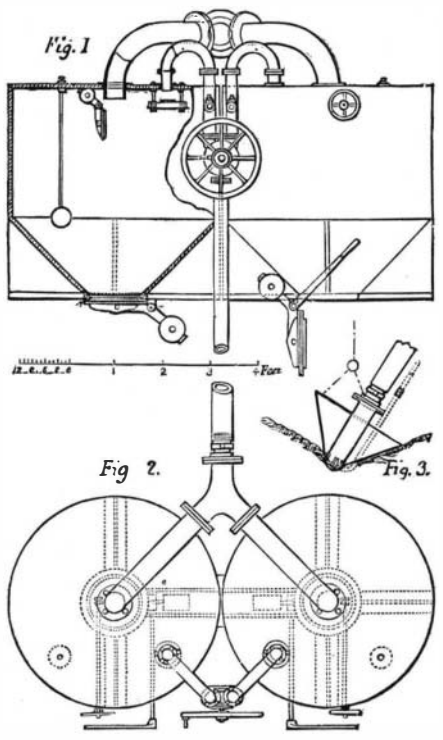
By noting the time of rising, southing or setting of the planets, the reader can determine about where to look for them as soon as they become visible.

A New Utilization for Jute Fiber.

M. Imbs, of Paris, has discovered that by means of jute threads woven in with other textile materials most beautiful and curious effects of light and color may be produced. The fiber takes dyes readily and in a peculiar way, and on a simple fabric may be so arranged as to imitate velvet in relief patterns. It is proposed to utilize this discovery for making wall tapestries.

REEVES' EXCAVATOR.

The employment of pumps in the excavation of sand and loose materials can now no longer be regarded as a novelty Hitherto, however, in all applications of the principle of suction to this purpose the process has been slow in action, subject to frequent stoppages, and accompanied by severe wear and tear of the machinery, consequent upon the lifting and shifting about, and also admission of sand and grit into the valve chambers of the pump. In the system illustrated the danger from this cause is removed by keeping distinct and detached the air pump and the sand tank. It is kept entirely above water, with the exception of a suction pipe through which the soil is drawn. The greatest facility for



working is combined with portability, as the machine, being entirely contained within one barge, can be towed or warped into harbor during bad weather, or moved about readily from place to place. When employed upon wall or quay foundations the same advantages are secured by placing the apparatus upon a truck running upon rails. In sinking caissons or cylinders by this method, it is not necessary in order to pump out the water to place a heavy air-lock and other weights at the top, and to maintain a bell full of compressed air in the bottom, nor is it necessary to leave large hollow spaces and shafts in the masonry or concrete for the conveyance of men and spoil materials, as are required under the pneumatic method. Regularity of subsidence is secured by the use of a flexible sand pipe, which can be directed into any corner of the caisson of however irregular form. Rapidity in sinking may be obtained by building the caisson almost solid, for, as already stated, the usual large air spaces and shafts are no longer required. Fig. 1 represents the end view, Fig. 2 the plan, and Fig. 3 the flexible sand pipe.

Where the water is deep, and the cylinder to be sunk of small diameter, it is not necessary to carry the latter up above the surface of the water at once, but only to put together a length sufficient to prevent sand and silt from being washed into the cylinder by the scour of the currents.

The apparatus has received a very extensive trial on the piers at the Tay Bridge, sixty having been sunk solely by this system. The foundations of these piers comprised in all 142 cylinders, varying in size from 6 feet to 31 feet 6 inches in diameter, and in some cases penetrating to a depth of 35 feet below the river bottom in 50 feet of tidal water.

It has also been adopted for the Severn bridge, and on a very large scale by the North British Railway Company at Dundee in filling up the vast waste behind the Dundee Esplanade with sand sucked up from the bed of the River Tay.

By the employment of small grouped charges of dynamite or lithofracteur, chalk and clay can be rendered sufficiently fluid to rise freely into the pump, the effect of such explosives on those substances being to convert them into a pulpy, slimy state, and not, as in the case of harder rocks, to shatter them into splinters.—*Engineering.*

A New Tanning Process.

M. Charles Paesi, an Italian chemist, has recently discovered a new mode of tanning, which is stated by the *Journal d'Hygiene* to be much superior in its results as well as more expeditious than any mode in which tan bark is used. It consists in macerating the skins in a bath of perchloride of iron and sea salt dissolved in water. The operation lasts for from four to six months. The perchloride is a powerful disinfectant and is said to render the industry much more healthy than it now is.

PRIZES are offered by the city of Munich for a design for a monument to Liebig. The first is $400, the second $300. Models, which should not exceed with pedestal 3 feet in height, will be transported to Munich free by the Commission, and must be submitted between June 1st and 15th next.