

some extraordinary circumstance the ship should break the line and lose sight of the bell, or if the vessel itself should sink, the operator would first, by unscrewing a nut within, cast his bell loose from the life line, and would then ascend. As soon as he reached the surface, he would be enabled to view his surroundings by means of a camera obscura at *r*; and by revolving the same by its tube, *W*, he could sweep the entire horizon. Lastly, having determined his course, he could proceed in the proper direction by means of his screw and rudder.

Correspondence.

Notes from Washington, D. C.

To the Editor of the Scientific American:

Congress has adjourned without enriching the lobby so much as usual. In fact it is generally conceded that our Solons have left Washington with cleaner consciences, in this respect, than any of their recent predecessors, and that there never were fewer jobs put through by any Congress for many years past. The patent lobby fared especially badly, not a single extension case, so far as I can learn, having passed, notwithstanding all their efforts. Whether this is owing to a slight spasm of returning public virtue, the approaching elections, the efforts of the press, or fear of the Grangers, is more than I can tell; but probably all these influences had their effects, and so the work of the lobbyists went for naught, although they mustered pretty strongly the last days of the session, trying, both by persuasions and threats, to forward their respective schemes. One of these—a second George Francis Train—even went so far as to threaten the Senators and Representatives with the opposition of the Internationals, of which he represented himself as a high officer, if they did not pass the extension case for which he was working, and that he would take the stump against the members of the committees on patents, if his efforts failed. Of course the Senators were immensely frightened at this fearful threat, but somehow they yet live, and have gone home without helping the client of Train *secundus*.

The bill to reorganize the Patent Office also failed, and a bill, introduced a few days since by Mr. Conger, amending Sections 23, 25, 33, 53, and 64 of the Act of 1870, as a substitute for the first bill, likewise failed to pass. The only act completed, so far as I can find, relating to the Patent Office, is one introduced by Mr. Wadleigh, which allows the usual sentence indicating that a work is copyrighted to be substituted by the words "Copyrighted, 18—, by A. B.," fixes the fees for recording or furnishing a copy of an assignment of a copyright at one dollar, and enacts that labels shall not be copyrighted, but registered at the Patent Office, for which a fee of six dollars is to be charged. This act takes effect August 1, 1874. The object of the change in the first section is to allow the use of the short sentence on small works of art, photographs, etc., that would be defaced by the use of the long rigmarole now employed.

Many curious schemes have been brought before Congress, some of which never got any further than the committee rooms, among which may be classed the application of some would be philosopher for an appropriation to test his method of artificially producing rain; and another case where an inventor wanted a law enacted that every election district in the United States should have his patent ballot box, to receive the votes for President, Vice President, and members of Congress, at a cost of fifteen dollars for each box. The committee to whom this case was referred contented themselves with recommending its adoption to the different State authorities, and so nipped this pretty little scheme in the bud. I endeavored to find out this patent, but could find none under the name of reputed inventor; but judging from the description I received, it must have been similar to one patented in 1858, and used in your city some years ago, as it was said to be composed of iron and glass. OCCASIONAL.

Levees on the Mississippi.

To the Editor of the Scientific American:

Please tell your readers who reside on the banks of the lower Mississippi that the proper way for them to build levees is to build them on an average a mile back from the banks of the river on each side. They will thereby show a little respect for the river, and give it an opportunity to discharge the waters of the vast valley which it drains; and will secure the remainder of their country from periodical overflow.

This line, a mile back from the river, should not follow the meanderings of the stream, but should average a mile on each side. In places where there are high banks on one side, as at Vicksburgh, the river should be permitted to overflow the low ground on the opposite side for two miles; and if, for any other reason, as at New Orleans, it would be impracticable to permit the river to overflow on both sides, a similar space on the opposite side should be left for the river to spread itself a little whenever it might have business of importance to transact.

Sioux Rapids, Iowa.

W. T. CROZIER.

White Ants.

To the Editor of the Scientific American:

The white ants of the torrid zone are somewhat smaller than the large black ants, which are sometimes troublesome here and are rather voracious, eating their way through a wooden box to obtain sugar, of which they are very fond, and of which they will consume a large quantity.

But the white ants of the torrid zone throw the black ones entirely in the shade as regards voracity. Pernambuco

(South America) is on about the 8th southern parallel; and the inhabitants build houses and make furniture of the native wood, which is hard and heavy, and proof against these ants. In one instance, a family moved from the South to Pernambuco, taking their household goods with them. Among the rest was a mahogany bureau with white wood inside work, as usual. This bureau, containing linen and cotton goods, was placed in a room but little used, and was not visited for some days. The lady of the house unlocked an upper drawer, and to her astonishment the front piece, of mahogany, fell to the floor, and on looking in she discovered that the inside work was nearly all eaten out, and her goods were in one common mass, resting on the floor, in a mixed condition but otherwise uninjured. The depredators had departed, but were soon discovered cutting out the interior of another piece of furniture. They proved to be the white ants of the torrid zone.

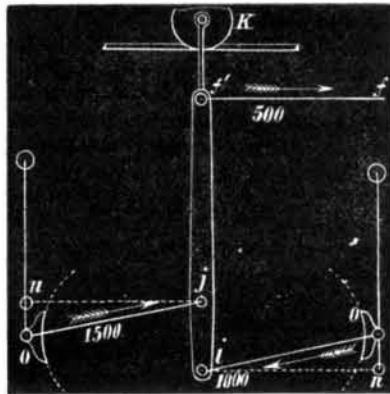
TRUMAN HOTCHKISS.

Stratford, Conn.

The Westinghouse Brake.

To the Editor of the Scientific American:

I notice in a recent number of *Engineering* an illustrated article upon the Westinghouse brake, commending the simplicity and equable action of its lever arrangement, etc. Whatever merit, of simplicity or otherwise, there is in its use of levers, it certainly has (in common with almost all the brakes now applied to cars) the defect of giving very unequal stress or pressure upon opposite wheels of the truck.



Let *k f j i* represent the lever that operates the brake blocks, *o*. I use the delineation and letters employed in the article referred to. The lever is held up by a pulley at *k*, which travels back and forth on a rod, as shown. Power is applied to the lever at the point, *f*, through the medium of the rod, *f' f'*, in the direction indicated by the arrow, one pair of the brake blocks being operated by the rod connected to the lever, at *j*, and the other pair by the rod connected at *i*, the pull being in the direction indicated by the arrows, and the leverage three to one, that is to say, the distance from *i* to *j* is one fourth of the distance from *i* to *k*. Hence a pull of 500 lbs., applied to the rod, *f' f'*, will cause a pull of 1,500 lbs. upon *j*, and a pull of only 1,000 lbs. on the rod *i*.

This unequal stress upon the brake blocks may not be a very serious matter, but it is a universal characteristic of the lever arrangement now applied to car brakes. The fault might be easily mended by connecting the rod, *j*, to the suspending bar of the brake blocks a little above the usual point, and the rod, *i*, a little below the usual point, as at *n*.

Worcester, Mass.

F. G. WOODWARD.

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, 1874.

Mercury.

At this time, June 20th, Mercury can be beautifully seen after sunset, below Venus, and a little further north.

On the 27th of June, Mercury will be at its greatest elongation, east of the sun. July 1, Mercury sets at 9 P. M. July 31, Mercury sets at 6h. 25m. P. M.

Venus.

Venus, which has been so beautiful all through the month of June, increases in apparent diameter, but sets a little earlier in July.

July 1, Venus rises at 7h. 11m. A. M., and sets at 9h. 33m. P. M. On the 31st, Venus rises at 8h. 17m. A. M., and sets at 9h. 00m. P. M.

Mars.

Mars is very unfavorably situated. It rises early in the morning, and sets at 7h. 42m. P. M., or nearly with the sun, on July 1. On July 31, Mars rises at 4h. 14m. A. M., and sets before 7 in the evening.

Jupiter.

Jupiter's diameter is becoming perceptibly less, and it sets before midnight. It comes to the meridian, the position best adapted to good observation, in the afternoon, so that we have only a few hours of darkness in which to watch its changes.

July 1, Jupiter rises at 10h. 51m. A. M., and sets at 11h. 15m. P. M. On the 31st, Jupiter rises at 9h. 15m. A. M. and sets at 9h. 26m. P. M.

Saturn.

The month of July is the best of the year for observations on Saturn; and although Saturn is very low in altitude, it will be an interesting object.

July 1, Saturn rises at 9h. 29m. P. M., and sets at 7h. 21m. A. M. July 31, Saturn rises at 8h. 25m., P. M., and sets

at 5h. 12m. A. M. It is among the small stars of *Capricornus*. Saturn does not attain an altitude of more than 31° during the month.

Uranus.

Uranus rises in the morning and sets early in the evening, and is therefore not well situated for observation.

Neptune.

This planet can be seen only by means of a good telescope. It crosses the meridian in the morning at 7h. 15m. on the 1st, at an altitude of 58°.

The Comet.

Clouds have prevented good observations upon the comet. It is bright enough to be seen very easily with the naked eye, and with an opera glass is a beautiful object. On the 13th of June an observation, made during partially cloudy weather, gave R. A. 7h. 4m. ±, Dec. + 69°. At that time its apparent motion was very slow.

It does not set, and is very readily found. On the 13th it made a nearly equilateral triangle with the pole star and the brighter star of the pointers. The same position would enable one to find it as late as the 18th of June, and probably it has not changed its position very much. To the eye, it is an elongated hazy star. With a glass, the nebulous center and the streaming train are very interesting objects. It passes the meridian at present (June 31) at 1h. 20m. in the morning, below the pole.

Sun Spots.

The record is from May 15 to June 16. Fourteen views have been photographed during this interval. Spots have generally been very small, only two groups appearing which contained good sized spots. In some instances the changes from day to day have been very marked; in others, only such as result from the sun's revolution on its axis. The daily motion of one group is shown for five days, from May 27 to June 1. While the group as a whole remained recognizable, there was a decided change in the arrangement of the constituent spots. Faculae have been unusually extensive and are beautifully marked in one of our pictures which happened to be very clear. The same picture also shows the mottling of the sun's surface, which is usually shown when both the weather and photography are good. Very bright faculae accompanied a group which was near the eastern limb on June 15. They were less prominent on the next day as the group was more distant from the limb.

Barometer and Thermometer.

The meteorological journal from May 17 to June 20 gives the highest barometer, June 15, 30.27; the lowest barometer, June 1, 29.58; the highest thermometer, June 9, at 2 P. M., 86°; the lowest thermometer, May 20 and May 22, at 7 A. M., 50.5°.

Amount of Rain.

The rain which fell between the evening of May 17 and the afternoon of May 18 amounted to 0.28 inches.

The rain which fell during May 20 amounted to 0.17 inches.

The rain which fell during May 25 amounted to 0.48 inches.

The rain which fell during the night of May 31 and the morning of June 1 amounted to 0.45 inches.

The rain which fell during the night of June 3 amounted to 0.16 inches.

The rain which fell during the afternoon of June 12 amounted to 0.45 inches.

Spectrum of the Comet.

Father Secchi has observed the spectrum of Coggia's comet, and finds the lines of carbonic oxide and carbonic acid very brilliant. The same astronomer notes a curious phenomenon which recently happened in Jupiter's first satellite. The atmosphere at the time of observation was quite clear, and the disk of the planet, while plainly defined, presented a slightly wavy surface. As the satellite neared the edge of Jupiter, and had advanced so that a distance of about one of its diameters separated it from the same, the observer was surprised to see the disk apparently extend itself toward the satellite, touch it, and then retract. This to and fro motion continued until the satellite was completely obscured by the planet, a period of four or five minutes. Father Secchi suggests that if similar undulations of the solar disk take place at the time of the passage of Venus, there will be strong elements of uncertainty in the observations, and that it would be desirable to employ means which will reduce to a minimum these effects of atmospheric oscillation.

Fatty Matters in Cast Iron.

An experiment made long ago by Proust revealed the fact that fatty matters can be extracted from cast iron when the latter is dissolved in certain acids. M. Cloez has recently separated these materials in a pure state, and their analysis reveals the interesting fact that they consist of carburets of hydrogen of the series C^2H^2 , and present all the terms thereof at least from C^6H^6 (propylene) to $C^{16}H^{16}$. This is a veritable organic synthesis, realized by the aid of substances purely mineral, and is susceptible consequently of important applications. In the *Science Record* for 1873 will be found an account of the extraction of similar matters from meteoric iron.

THE Sandy Hook boiler experiments, which have been suspended since December last, will be resumed about the beginning of August. The recording instruments used last year were found to vary considerably in the forms made by different makers, and careful tests are now being conducted in order to ensure absolute uniformity and correctness of indications.