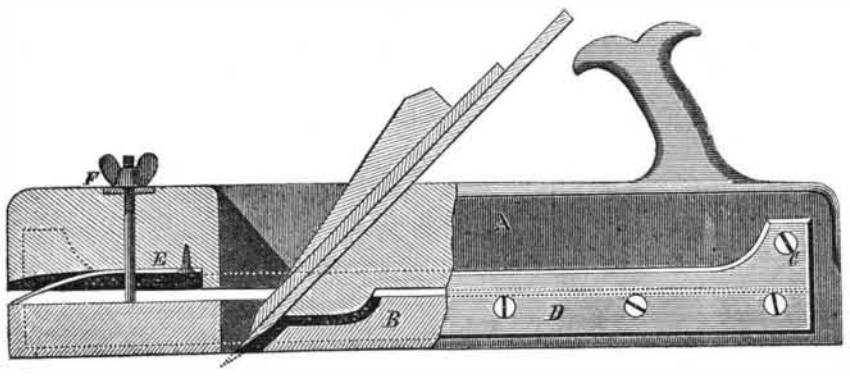
Improvement in Joiners' Planes.

The objects of the invention shown in the accompanying engraving are to give a control over the thickness of the shaving and depth of the cut by the pressure of the hand, and to prevent the drag of the bit on the board when the plane is drawn back. The stock of the plane is made in two parts, the upper portion, A, which holds the bit, being pivoted to the lower part, B, at the rear end by a screw, C, passing through metal guide plates, D, on each side the plane. The front end of the upper portion is raised from the lower portion by means of a spring, E, which, when the pressure of the hand on the front of the plane is withdrawn, lifts the upper portion together with the bit or plane iron. The amount of this movement is governed by the thumb screw, F. From this description and the engraving, which is partly in section, the construction and advantages of this device may be plainly seen.



BUCKEL'S ADJUSTING PLANE.

Patented through the Scientific American Patent Agency, August 25, 1868, by George Buckel, who may be addressed at 17 Prospect street, Detroit, Mich.

THE PROTUBERANCES ON THE SUN.

Among the several scientific expeditions sent to the East by the European governments for the purpose of observing the late total eclipse of the sun, was a photographic company under the auspices of the North German States. This party was led by the distinguished scientist and photographer, Dr. Vogel, whose interesting contributions often appear in our paper. A new photometer, or instrument for indicating the actinic power of light at all hours of the day, has been lately patented in this country by him. Dr. Vogel has communicated to the Philadelphia *Photographer*, and also to the London *Photographic News*, some interesting particulars concerning his photographic eclipse experiences, among which are the following:

We were not spared the sufferings generally imposed on the traveler who passes through the Red Sea at the hot time of the year. This sea, inclosed on both sides by deserts, and connected with the Indian Ocean only by a very narrow channel, forms an isolated bay, where, in consequence of the customary calms and want of currents in the water, the temperature increases in the same degree as you advance toward the south. The perspiration flows down your body just as if you were in a steam bath; the whole of the skin is heated and irritated, and happy is he who finds a spot on deck where a slight breeze cools him for a moment. We were glad to reach the more airy ocean, and anchor near Aden on the 2d of August.

The aspect of this town is not in the least an agreeable one. You see a quite bare, savage mass of rocks, interrupted by some works of fortification, warehouses, shops, and coal sheds. The heat was supportable as long as we were not at work, but as soon as we began the slightest exertions the discomfort was very great.

At the day of the eclipse we rose at four o'clock in the morning. It was the task of the North German expedition to make a photographic view of the eclipse during its totality. For this purpose we had a long telescope with a lens of six inches, without difference of focus, and with a focal distance of six feet. This lens, constructed by Steinheil, afforded a solar image of three quarters of an inch in diameter, which was taken upon a photographic plate by means of an ordinary sliding chest for two images.

The totality of the eclipse at Aden was about three minutes long (in India five minutes); nevertheless, we had chosen Aden for our station because there were already photographic observers in India, and because the totality appeared at Aden about an hour earlier than in India. Therefore a comparison of the different results would enable us to decide the question, if the *protuberances* appearing at a total eclipse of the sun were changing in the course of time or not.

Our task was now to get within these three minutes as many views of the phenomenon as possible. For this purpose we had previously exercised ourselves in the employment of the photographic telescope, like artillerymen with their guns.

Dr. Fritsche prepared the plates in the first tent, Dr. Zenker put the sliding chests into the telescope, Dr. Thiell exposed, and I myself developed in the second tent.

We stated that it was possible in this way to get six images (three plates of two images) during three minutes.

When the decisive moment was fast advancing, the sky, hitherto covered with clouds, showed some openings, through which the sun, already covered partially by the moon, was to be seen. The landscape around was illuminated by the strangest light, a medium between moon and sun light.

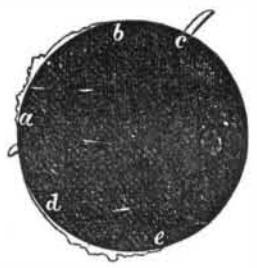
The chemical strength of light was exceedingly weak. A proof plate gave a wholly exposed image of the cloud after fifteen seconds. The sun cresent became smaller and smaller, and the opening in the clouds seemed to increase.

The last minutes before the totality (which began at twenty minutes past six o'clock) went rapidly away. Dr. Fritsche and myself crept into the tents, where we remained, consequently we have seen nothing of the totality. Our work began; we exposed the first plate five and ten seconds, in order to know what was the just time.

Muhammed, our black servant, brought the first attempt into my tent. I poured the iron developer over the plate, eager to know what was to come. At this moment my light was extinguished. I called for light, but nobody heard me, as all were about their task. I stretched my right hand out of the tent, holding the chest in the left, and happily caught a small oil lamp, which I had previously prepared. And now I saw the image of the sun appearing on the plate. The dark margin of the sun was surrounded by a series of peculiar elevations, the other side showed a strange hook; the phenomenon being exactly the same in both views. My joy was great, but there was no time for enjoyment. I soon received the second, and, after another minute, the third plate. "The sun is coming forth!" exclaimed Dr. Zenker. The totality was over. All this seemed to have been done in a moment.

When I developed the second plate I perceived only very weak traces of an image. The clouds had veiled the sun at the very moment of the exposure. The third plate gave two brilliant views, with protuberances at the lower margin. Glad to have reached so much, we washed, fixed, and varnished the plates, and immediately took some copies on glass, which were to be dispatched to Europe separately.

I here give you a design of the plate. Over the margin of the sun we see the protuberances, *a b;* on the opposite side we perceive the strange hook already mentioned. Its height was about one-fourteenth of the sun's diameter, and it would therefore in reality be 12,000 miles high. On the third plate we got the protuberances, *d e*, at the lower margin.



Great and Small—Microscopes.

A correspondent of the Boston *Journal of Chemistry* says:

"There is a curious principle (which may be perhaps called physiological) involved in the terms *great* and *small*. It is this: that one has no conception of magnitude except by comparison of one object with another; and no one has or can have any knowledge of the appearance of magnitude to any other one. That is, I cannot convey to you my idea of the size of any object except by comparing it with my idea of the size of some other object. If I say that a thing appears to me to be one inch long, I merely compare it with an inch rule; but I do not, cannot know, that an inch appears to you as long as a foot does to me, or the reverse. Again, when one looks at an object that is completely isolated (to the vision) from all other objects with which it might be compared, we form an idea of its magnitude entirely arbitrary. For example, the moon in a clear sky must present exactly the same apparent magnitude to every observer. This is determinable mathematically; yet it is notorious, that, of a dozen people who may be asked their idea of the moon's apparent size, no two may agree.

"This same fact comes out in the use of the microscope. Almost all novices in the use of that instrument ask what is the magnifying power, as if the answer to that covered the main value of the instrument, thinking that the more it magnifies the better it must be; when in fact power is a secondary consideration in the value of a microscope, great power of inferior quality being obtainable at very little cost, and that what is called the magnifying power is calculated from an arbitrary standard. The apparent size of any one object in the field of the microscope is by all observers governed by their estimate of the apparent diameter of the illuminated field in which the object is seen. There are modes of determining this by comparison with other objects, but as the instrument is generally used, nothing is presented to the eye but the 'field,' and no other object is compared. Under these circumstances, different persons make widely different estimates of the size of the field. I once tried the experiment of obtaining their estimate of the apparent size from ten individuals, all of them accustomed to the use of the instrument, and they varied from 9¼-inch diameter down to 2-inch (my own case). I have since met an individual who estimated it 15 inches. Any one possessed of a microscope can try this experiment, and it will be found to afford a company much amusement, and excite great surprise.

"Now, it is self-evident, that to the one who made the estimate of 15-in., any object of, say 1-1000 of an inch in length, would *seem* to be seen 7½ times as large as it seemed to me, although we must have seen it exactly alike. Thus, the only conception of magnitude is comparative."

Cook's Telegraph.

We have before us as we write some very beautiful specimens of printing by Cook's improvement of the late Gaetano Bonelli's automatic printing apparatus, just received from Paris. The printing is done in fine bold letters, the words well compacted and spaced, and printed not on a continuous strip, but line under line, as in a printed circular. It is certainly a very admirable result, and indicative of a perfection in telegraphy and a use of the subtile powers of electricity which must enhance the acceptability of the telegraph to the public. The great advantage of the autographic process is that it renders error next to impossible, or rather, that it does not leave to the action of outside causes, or the use of arbitrary characters whose relations to each other may be misunderstood, or to the vagaries of an operator's brain as he manipulates his messages, letter by letter, the opportunity to change their composition. The message is set up and compared before it is transmitted, and if it goes at all, must go exactly as first prepared

The paragraph before us is one of 35 words, transmitted in 20 seconds, a speed equal to 315 messages of twenty words each per hour. This fact is suggestive of a future in which the entire labor of our offices will be changed, and the operation of transmission become simply mechanical and comparatively unlaborious. We will not be surprised if, in time, parties who prosecute much of their business by telegraph should supply themselves with telegraphic type, arrange their messages for transmission in a case adopted for that purpose, prove them before sending to the telegraph office, and the operator have nothing to do but pass them through the manipulating instrument. By such processes as these only can large quantities of matter be sent over the wires without the fatigue connected therewith, and, what is equally desirable, with the utmost assurance of correctness which mechanism can afford.—*Journal of the Telegraph.*

Editorial Summary.

THE VELOCIPEDE MANIA is beginning to set in, and with the opening of the spring months we may expect to see our parks and highways thronged with this cheap and agreeable substitute for the horse. The two-wheeled velocipede is not exactly the thing wanted for general use, as it will be somewhat difficult for novices to keep upright upon it. A nicely adjusted vehicle with a double hind wheel would be most desirable for all classes. The ladies will need something of the kind, and for obvious reasons; unless they don the Bloomer costume, they will not be able to ride on the two-wheeled machine. It appears to us, judging from the numerous letters we receive on the subject, that there is to be a brisk demand for a good velocipede, and whoever gets into the field first will find it a profitable speculation.

GEOLOGICAL NEGATIVES.—Mr. James Thompson, of Glasgow, Scotland, has contrived a new method of producing photographic negatives of geological specimens. He saws from the stones thin slices containing fossil remains or other specimens; these when polished are so thin and transparent that they may be used as negatives for photographic printing upon the usual sensitive paper. Beautiful prints are thus obtained, having all the fidelity of nature itself. Large numbers of these fossil negatives have been prepared by Mr. Thompson, and he has undertaken to supply the British Museum with duplicates.

IT is proposed to remove Yale College from its present site to a more suburban one, thereby securing to the institution an accession of funds from the sale of its property, which, from its central location, is of great value. The value of this property is sufficient, it is said, to to purchase and fit up suitable grounds, erect buildings, and leave an endowment of a quarter of a million dollars, should the proposal be acted upon. The removal of the college is also said to be worthy of consideration for sanitary reasons.

THE Powell Scientific Expedition ascended to Longs Peak, in the Rocky Mountain range, on the 23d inst. After making the usual scientific observations a monument was erected as evidence of the visit. In it was placed a tin case containing a record of the observations with date, names of party, etc; A flag was planted and left flying. This peak is a celebrated landmark. Its hight however is not remarkable, being only 14,250 feet above the sea level.

THE English scientific papers are criticising severely our new war steamers. They say that the entire new steam machinery of the United States navy is the most costly, most cumbrous, least efficient, and most utterly ridiculous in the world, and that no other power in Christendom would tolerate such blunders in its national engineering practice.

COMETS SELF-LUMINOUS.—The London *Daily News*, says that the special points of interest attaching to the two comets of this year—Borsen's and the new one—is the remarkable discovery that both comets are gaseous and self-luminous, and that the latter consists of volatilized carbon.

CIDER may be preserved sweet for years, by putting it up in air-tight cans after the manner of preserving fruit. The cider should be first settled and racked off from the dregs, but fermentation should not be allowed to commence before canning.

IT is stated as a fact worthy of note, that London was recently exempt from accidental or incendiary fires, for a period of twelve hours.