

Here, then, is a new basis for all physical science with a vengeance. Since the time when a perfectly elastic fluid was ascertained with tolerable certainty to permeate the universe, and to convey the vibrations of light from the sun to the earth, philosophers seem to have rapidly grown more etherial in their ideas respecting the construction of solid bodies. The discovery also of the grand law of the conservation of energy, of the total indestructibility of force, has brought the minds of men of science into a state which prepares them to listen with considerable attention to novel ideas like that of vortex atoms, which bases the existence of solid bodies upon an all pervading energy rather than upon crude lumps of matter which have never been seen. Those who have had much to do experimentally with the imponderable forces, especially electricity and magnetism, the latter of which now presents phenomena shrouded in the densest mystery, are inclined to think the theory of solid atoms of hard matter far too crude to meet in any degree the observed facts. What is the reason that this mysterious force deflects magnetic needles in the observatories at Kew and Lisbon at the same instant of time? Does the force come from the sun? Does it traverse the hypothetical ether in vibrations like those of light? Mr. Varley, who probably knows as much about electricity and magnetism as any man living, has no faith in the idea of the existence of hard rigid lumps as ultimate atoms, and has in his researches, discovered that these imponderable forces have some properties which are commonly ascribed only to solid matter.

So wirbel-bewegung is vortex motion. In all ages mysterious powers have been ascribed to the circle. A serpent with its tail in its mouth has long been considered the fittest emblem of eternity. Dancing dervishes, devotees of wirbel-bewegung, for centuries have achieved a meritorious amount of devotion by spinning around upon one leg. The lamas of Thibet pray by machinery, their petition being printed upon small windmills, which rotate right merrily in every passing breeze. Sometimes, it is true, the wind chances to fail, but a band over the smoke-jack in the chimney furnishes the necessary mechanical power, to grind the prayers. The world is circular, and travels round the sun in a circle, the moon twirls round the earth in a circle, the sun dances round his axis in a circle, and is supposed himself to travel in a circle, round the star Alcyone, the center of another circle, so there is plenty of precedent for Professor Thomson's idea that atoms whirl in circles, and that the heads of philosophers spin round in an endless wirbel-bewegung. Astrologers and other clever men found this out long ago, so made their bodies spin round when performing their incantations. Dr. Aldrovando, first physician to Prester John, leech to the Grand Lama, and hakim in ordinary to Mustapha Muley Bey, is recorded by one of the fathers of the Church, to have thus, by unholy rites, obtained power over the spirits of the nether world.

"On one side was an article bearing a strong resemblance to a coffin; on the other was a large oval mirror in an ebony frame, and in the midst of the floor was described in red chalk a double circle, about six feet in diameter, its inner verge inscribed with sundry hieroglyphics, agreeably relieved at intervals with an alternation of skulls and cross-bones. In the center was deposited one skull of such surpassing size and thickness as would have filled the soul of a Spurzheim or De Ville with astonishment. A large book, a naked sword, an hour glass, a chafing dish, and a black cat, completed the list of movables. The doctor seated himself in the center of the circle upon the large skull, elevating his legs at an angle of 45 degrees. In this position he spun round with a velocity to be equaled only by that of a tee-totum, the red roses on his instep seeming to describe a circle of fire. The best buckskins that ever mounted at Melton soon yielded to such rotary friction—but he spun on—the cat mewed, bats and obscene birds fluttered overhead."

Now here is a clear case of wirbel-bewegung, known to a scientific man of the days of old. Now-a-days, whenever a discovery is made, some good-natured friend of the promulgator always rises to say it is not new; as was the case with Mr. Wilde's new magneto-electric machine, so here is a clear case against Professor Thomson. Probably he made his discovery by going through the ceremonial incantations laid down by the illustrious Dr. Aldrovando, but this is one of these grave secrets which his tailor only can unravel. The scientific world now travels onward at a rapid rate, and who knows whether before long the canny folks in Glasgow may not see their learned townsman building himself a house of solid matter, made by banging smoke-rings out of a wooden box with a damp towel?—*The Engineer.*

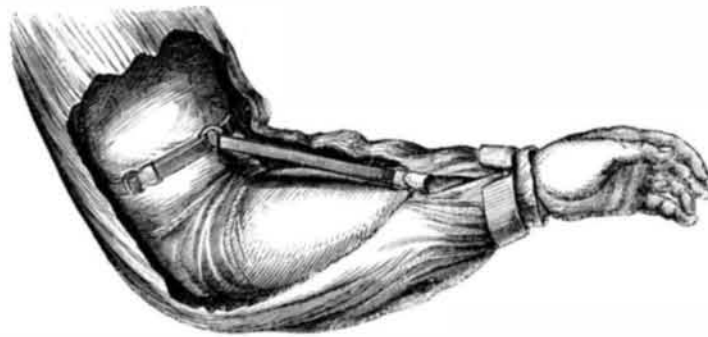
THE PALM OF THE INDIAN ARCHIPELAGO, according to M. Maxime du Camp in the *Revue des Deux Mondes*, furnishes from the envelope of its trunk and stalks a peculiarly valuable fiber for covering telegraph cables. An anchor fished up after 60 years submersion, had a piece of native cable from this substance attached, which was as strong as when new. A sugar manufacturer in Java has used a mattress of the same material in the river which supplies water to his establishment, as a filter, for the last twenty-five years, submerged during four months and hung up in the torrid sun the rest of the year; yet the mattress is as sound and strong as ever. The application proposed is about to be tested, as the submarine cable between Batavia and Singapore has been covered with a tissue of *aran*, as it is called by the natives, and in a few years will afford some evidence in regard to its value.

A RODMAN GUN FOR THE BRITISH GOVERNMENT.—One of these guns of 15 inches calibre has been cast for the British Government for experimental purposes, and will shortly arrive in England.

POWELL'S SLEEVE SUPPORTER.

In the labors of the household, the store, shop, and laboratory the annoyance of long or drooping sleeves is one which all more or less feel. The plan of slipping an elastic over the arm is not half efficient, and the rolling up or tucking of the shirt or dress sleeve is apt to deface the smoothness of the fabric.

The engraving shows a simple device for keeping the sleeve in a proper position when at work, that appears to answer the requirements without the annoyances of the temporary contrivances generally employed. It is merely a strip of flat silk elastic, one end of which is attached to a slide of sheet metal and the other to a hook. The hook end passes



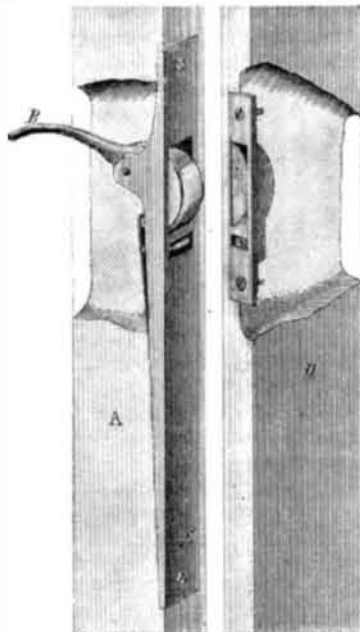
through a ring engaging with the loop formed by the slide and the elastic itself. The loop formed by the slide and ring is slipped over the arm above the elbow and the hook drawn through and attached to the opening above the wristband.

It will be seen that the movement of the hand controls the elasticity of the band and also that the tension can be regulated by the slide. It seems to be just what is needed by hundreds, as it can be used under all circumstances. It was patented through the Scientific American Patent Agency March 19, 1867, by Thomas Powell, Milroy, Rush Co., Ind., whom address for other facts relating to the device.

BUTTERWORTH'S IMPROVED WINDOW SPRING.

The breaking of window weight cords, the difficulty of putting in new cords, and the annoyance of rattling window sashes have stimulated many inventors to provide a substitute for the sash weight and at the same time to produce a lock for the sash to hold it in position. The engraving shows one which was patented March 24, 1863, by J. C. Butterworth Jr., of Providence, R. I. It is simple and always direct acting.

On the sash frame, A, is a plate of metal mortised into it, and carrying a spring lever, B, having at its outer end a segment of a circle the face of which is of elastic rubber intended to have a bearing against the window frame in which the sash slides and to hold the sash firmly against the other side of the window frame. This segment is held in place by a flat spring of steel, riveted to the plate at C, and bearing at



the other end against the segmental portion of the lever. Riveted to this spring is a projection of metal that passes through a corresponding aperture in the plate on the window frame, D, to lock the window when closed. By placing these plates at desirable distances on the window frame, the window can be locked at any point desired. The plate on D, has a semicircular recess to receive the segment of the lever, B, at any point to prevent unnecessary strain upon the spring.

By raising the end of the lever, B, the segment is retracted and the sash left free, so that the sash can be readily raised; by releasing the lever the spring forces the rubber surface against the window frame or engages the projecting snug with the mortise in the plate on the window frame. The lifting instead of the depression of the lever assists the contrivance in raising the window, being in this respect superior to those window latches which operate in a reversed manner.

J. C. Butterworth Jr., Providence, R. I., will furnish the springs or give any information desired relative to the price, action, etc., of this device.

THE ATLANTIC AND PACIFIC TELEGRAPH COMPANY has been organized to build a new line through from New York to the Pacific. The division from New York to Buffalo is to be completed by the first of next September.

HUB-BORING MACHINE.

This contrivance is intended for wheelwrights and carriage makers who do not have stationary machinery or power to assist them in their business. It is a hub-boring machine worked by hand. The usual way to bore hubs by hand is to use first an auger which bores a straight hole and then to ream out the hub thus made with a conical pod auger or semicircular conical reamer. To do this two tools are necessary but with this machine only one. The cutters are carried on the shank, A, on which is a stop, B, to regulate the depth of the shoulder. The lever nuts, C, clamp the hub, and their screws are secured to a disk in which traverses an eccentric that, by a set screw, D, and a plate seen in front de-



termines the taper of the hole to be bored. E is an open nut by which the cutters can be drawn back to the butt of the hub without turning the handle or shank.

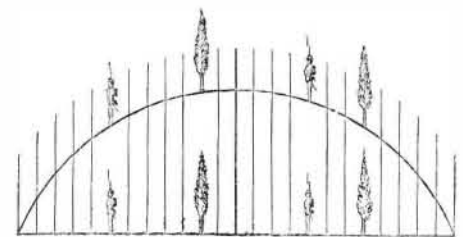
To bore a box, set the machine on the hub, then measure the distance from the eccentric plate to the nut, E. Make a drawing of the iron box which is to be seated in the hub, giving an outline with center and side lines extending down to the face of the open nut, E, giving the small end of the hole intended a continuation to the top of the diagram. Set the cutters one half the diameter of the small end of the hole gaged from center of the shaft and bore through the hub. Then move the eccentric plate by the set screw, D, to half the taper required and bore through again. The result will be a taper to fit the box.

The work can be done quickly and with certainty of satisfactory results. When accustomed to the machine, the workman will not require a drawing, but will be able to judge by the eye how to set the cutters.

For further information address Ira B. Gage, of Constantine, Mich.

UPRIGHTS ON A PLANE AND ON A CURVE.

A correspondent from New Hampshire writes as follows: "I would ask your opinion of the picket fence question discussed lately in the columns of the *New York Ledger*. Mr. Bonner cannot be convinced that it would not require a greater number of pickets of a given width, placed a given distance apart, to build a fence over a hill than if they were placed on a level plane running from the same points on either side of the hill. I say it will take the same number for each, and would like your opinion."



We have not read the discussion referred to, but we think our correspondent is correct. By reference to the above diagram in which the curve represents the hill, or reversed, a valley, it will be seen that the same number of upright objects, either fence pales, men, or trees can be placed on a level as on a curve; that it requires no more to occupy the same horizontal distance on the convex or concave curve than on the plane. That the surface distance is greater on the curve than on the plane is apparent, but in the case of upright or vertical objects the horizontal distance is the same in both cases. No more trees can be planted on a hill side than on a level representing the same horizontal distance. The diagram appears to be a perfect demonstration of the matter.

MORE UNPLEASANT COMPARISONS.—Among the many tokens, small and great, of the arousing of a German giant to take the place of England in commercial, political and perhaps maritime supremacy, are mentioned the twin significant facts, that while business is languishing in England, the Berlin Railway Plant Company and a Stettin shipbuilding concern, the "Vulkan," have both made enormous dividends in the last year, being respectively ten and eleven per cent.

GOOD WORKMANSHIP.—A locomotive constructed in the workshops of the Orleans Railway company, has run 93,150 miles, in three years, without submitting to any repairs. The engine is to be exhibited at the Exposition, and is worthy of it.