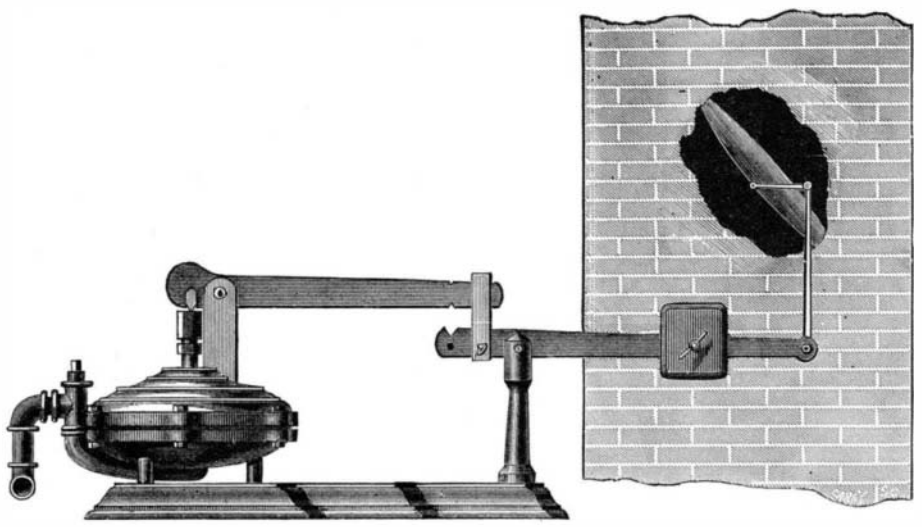
NEW DAMPER REGULATOR.

We give herewith an engraving of a recently patented automatic damper regulator, embracing several novel and valuable features. The mechanism of this regulator insures a large increase of leverage, movement, and sensitiveness, by the use of a compound lever, having adjustable fulcra, by means of which the same machine is adapted to the use of either high or low pressure; each regulator is provided with a siphon attachment, to prevent the contact of steam with the diaphragm. The diaphragm is perfectly supported, and is arranged so as to roll instead of stretching or wearing it, thus making it more durable than other forms of diaphragm.

This regulator will be readily understood by reference to the engraving, and will be appreciated by practical engineers. The great saving in fuel, the steady power, the regularity of speed, and the guaranty of safety from explosion by excessive steam pressure, are features which must recommend it to all steam users. It is claimed by the manufacturers that it will control the pressure of steam within one pound, and *fully* open or close the damper on a variation of two pounds.

The American Steam Appliance Company, of 13 and 15 Park Row, New York, and 28 School street, Boston, Mass., are sole manufacturers of the regulator.



PEERLESS DAMPER REGULATOR.

The Lick Observatory.

The recent decision of the courts with regard to the Lick estate in California gives the trustees of the estate $700,000 for carrying out the observatory project, which will be pushed forward as rapidly as possible. The question as to the kind of telescope to be adopted has not yet been settled, and the respective merits of the reflecting and the refracting telescopes are being investigated. As the trust deed directed that the instrument should be the most powerful in the world, a refractor of over thirty inches in diameter will have to be obtained, as two of twenty and thirty inches have recently been ordered, respectively for the Vienna and Pultkowa observatories. It will take two years from the time the order is given before the disks will be ready for the opticians, and it is calculated by the trustees that three years will elapse before they can turn their attention to the third bequest, the School of Mechanic Arts.

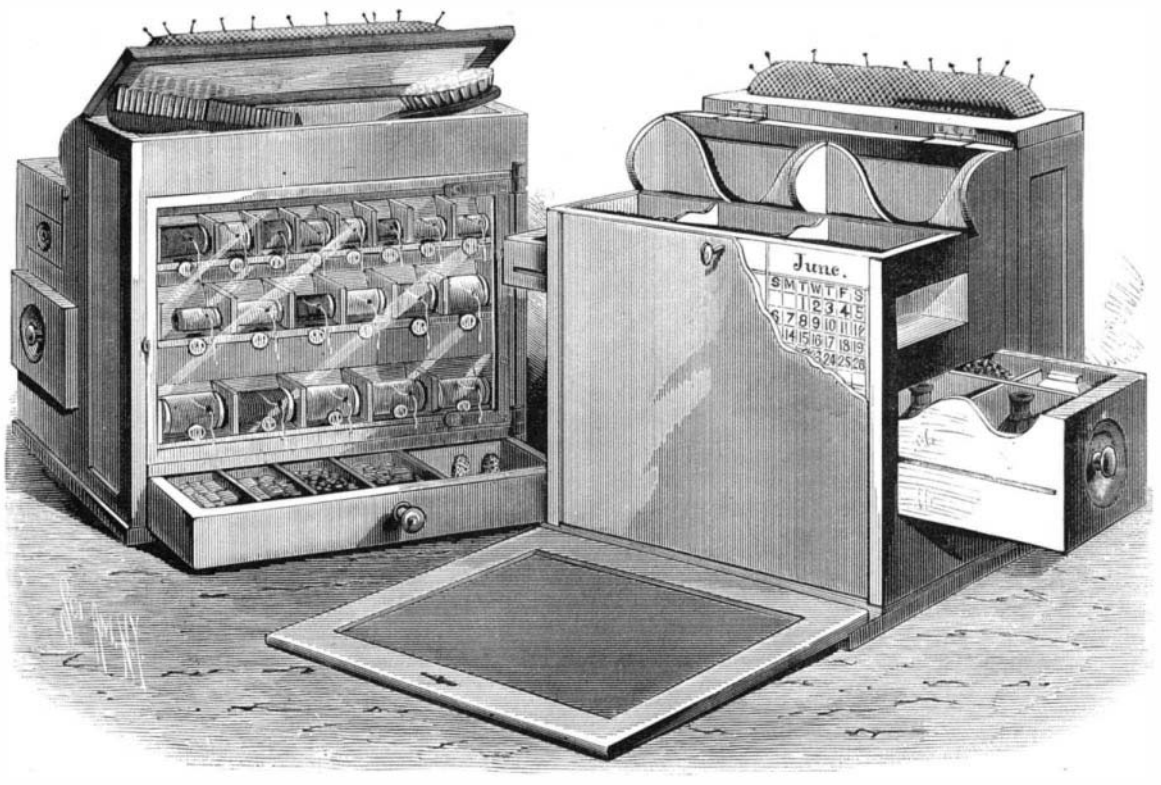
NOVEL TOILET CABINET.

The accompanying engraving shows opposite sides of a compact and convenient cabinet recently patented by Mr. F. C. Zanetti, of Bryan, Texas. It is designed for containing sewing, writing, and shaving materials, and various other articles of domestic use in frequent demand. In this receptacle these articles can be arranged in an orderly and convenient manner, so that any one or more of them can be obtained, when needed, instantaneously and without trouble.

The invention consists of an outer case, divided inside by horizontal and vertical partitions into three separate compartments. The first of these compartments, at the front of the cabinet, is provided with a mirror at the back, racks for spools, razor cases, and razor strop, and is closed by a glass door, on the inside of which are fixed racks for spools, and through the glass, opposite each spool, are perforations through which the ends of the threads are passed, so that the thread can be taken from the spools without opening the door. A subdivision of this compartment above serves as a receptacle for brushes and combs, and the cover of the receptacle has a mirror on its under side and a pincushion on the upper side. The second compartment is subdivided for the reception of drawers adapted to be drawn halfway out from each end, and envelope, card, and paper cases and pen racks. The third compartment is provided with a drawer opening from the front of the cabinet, said drawer being subdivided into cells for the reception of various articles used in sewing and mending. The back of the cabinet is provided with a hinged and folding slate and writing tablet and a place for a large calendar.

This cabinet is designed to contain a class of articles that too often are not provided with a place, and are liable to be found almost anywhere in the house.

Further information may be obtained from the inventor.



ZANETTI'S TOILET CABINET.

The Unitary Theory of Electricity.

Herr Edlund has drawn attention to an electrical experiment that has not hitherto been thoroughly explained. Let an open metal tube or cylinder, capable of rotation about its axis, be placed over a magnet of double its own length, so that its lower end is opposite the middle of the magnet, while its upper end is opposite the magnet pole. Then let a current of electricity of sufficient strength be passed from one end of the tube to the other. The tube is found to rotate with a velocity which is independent of the resistance of the metal of which it is composed and of its thickness. Longitudinal slits cut in the tube do not affect its rotation. There is, therefore, here a complete conversion of electromotive force into ponderomotive force. W. Weber inferred that the resistance of the movable conductor to the passage of the current is the medium of this transfer of the energy, and argued that the first tendency is to rotate the current in the conductor, but that as this could not be done without moving electricity through the substance of the conductor, and therefore against its resistance, the principle of least heat requires that the energy should be transferred in an indefinitely short time to the conductor itself, which therefore rotates. Herr Edlund, however, sees in the experiment a confirmation of his "unitary" theory of electricity.

Preparation of Cotton for Pyroxyline.

M. Aimé Girard is the author of a new means of preparing cotton to fit it for making pyroxyline. The cotton is thoroughly impregnated with a solution of carbonate of soda, and, when well washed, it is then thoroughly dried. The cotton thus treated is then plunged into a bath composed of water, 100 parts, nitric acid, 3 parts.

A very pulverulent cotton is thus obtained, which M. Girard names "hydro-cellulose." It appears that this product is far superior to the ordinary cotton for obtaining excellent pyroxyline for photographic purposes. The photographic pyroxyline is obtained by immersing the hydrocellulose in a solution composed of sulphuric acid (66°), 1800 grammes, nitric acid (40°), 680 grammes.

After twelve minutes' immersion the pyroxyline is thrown into a basin of water and then well washed under a tap. It is then allowed to dry spontaneously in a dry room.

STEREOSCOPIC LANTERN PICTURES.

As you have again opened this interesting subject, I shall be glad if you will permit me to place on record a few thoughts of my own respecting it.

The production of stereoscopic effect by the lantern upon a large screen has at intervals, for a considerable period of time, been the object of experiment with me, says Mr. John Harmer, in the *British Journal of Photography*, the outcome of which, up to the present, is a method of obtaining it having one of the disadvantages of, though it appertains to, the other methods mentioned in your leading article, namely, the necessity for each spectator to be provided with a piece of apparatus to make the effect evident.

The arrangement requires a couple of lanterns—one to project the left eye half of a stereoscopic transparency, the other the right eye one, each of which when projected must occupy as nearly as possible the same part of the screen, and being, if viewed together, in hopeless confusion. In front of the two lanterns must be fixed a revolving disk, pierced with three apertures in such a position with respect to the lanterns that the light shall not be allowed to pass from one of these instruments till the other is exactly shielded. With this disk in motion the right and left halves will be thrown alternately upon the screen, producing, if the motion be sufficiently rapid, just the effect of two open lanterns, the only difference being that the extremely small intervals of darkness would slightly reduce the illumination without affecting the continuity of the mental impression in the least.

The piece of apparatus necessary for resolving this confusion into stereoscopic effect is composed of two eyepieces, having a revolving disk similar to the one just described in every respect except size, this latter bearing the same proportion to the larger disk as the eye does to the lantern lens. The revolutions of these must synchronize exactly, so that when the left eye picture is allowed to pass to the screen the left eye must be uncovered to view it, the same being required for the right eye and its picture, and the rate of motion must be such that the alternate projection of the pictures must take place not less than ten times per second. Each eye will then see its own proper picture in the same direction, and will deal with the dissimilar impressions as with those obtained direct from nature.

The synchronous movement of the disks could be obtained, if the apparatus were fixed by band and pulley, or, to secure the advantage of portability, by a small electromagnetic engine and phonic wheel, by which a number of disks could be driven. If the above were constructed for exhibition purposes the disks could be arranged to produce stereoscopic. pseudoscopic, and superscopic effects—the first by an eyepiece adjusted as above, the second by providing for either to be uncovered at the instant the picture for its fellow was visible, and the last by a disk revolving at half the rate of the lantern one, thus cutting off the light of one lantern entirely.

In your *résumé* you omitted to mention a very excellent method discovered by the late M. Claudet some years ago, which he described and exhibited before the Royal Society at the time. He obtained the key note in the following manner: While experimenting with a "focimeter" he noticed that the image of the instrument upon the focusing screen of the camera appeared to possess its three dimensions—length, breadth, and thickness. This at once led him to investigate the cause, which he found to proceed from the fact that each eye actually sees a different view of the image produced by a lens upon a translucent screen, the natural object appearing to be viewed by the eye through screen and lens, the relations of its parts being affected by any change, just as would be the case if no apparatus were interposed, size excepted. This principle he embodied in an arrangement for exhibiting stereoscopic effect on a large scale in this wise: A large sheet of ground glass was erected perpendicularly, behind which, at a suitable distance, were placed a couple of lanterns, each one inclined inward sufficiently to throw its half of the stereoscopic picture upon the screen, with the axes of the lenses crossing there, to press onward into the eyes of the spectator some feet in front. It is manifest that this cross-