

**THE DOUM PALM.**

The doum palm (*Hyphaene thebaica*), an illustration of which appears on this page, is remarkable among palms in having branching stems. The trunk is simple when young, but in old trees is forked three or four times, each branch terminating in a tuft of large fan-shaped leaves. The fruit is of about the size of an orange, irregular in shape, with a polished yellowish brown rind, inclosing a single horny seed. The rind, which is dry, fibrous, and mealy, is said to taste somewhat like gingerbread, and is used as food by the Arabs. Although the tree is quite a large one, the trunk itself is seldom over 30 feet high.

**OFFICIAL PREJUDICE**

General A. A. Humphreys, Chief of Engineers, U.S.A., has recently addressed to the chairman of the House Committee on Levees and Improvements of the Mississippi, an extraordinary letter. The main object appears to be to discredit the work of Captain Eads and to defeat the efforts of that gentleman now being directed toward the more vigorous prosecution of the already successful undertaking. General Humphreys has always been a strong advocate of the Fort St. Philip canal scheme of opening the Mississippi and a non-believer in the efficacy of Captain Eads' plan. But whatever his views may be, they certainly do not justify him in completely shutting his eyes to absolute fact, as he does when he asserts "that the opinions expressed to the effect that a new bar would form at the sea end of the jetties, and that it would extend into the sea more rapidly than the old bar, are correct, even during the changes going on under the scouring power of the jetties, aided by dredging between and seaward of them."

Instead of there being an advance there is an actual recession of the bar, and the jetties have not even been carried out to their projected length, as they are actually more than 200 feet shorter to-day than they were originally intended to be. The deepening has been so marked at the sea ends of the jetties, where the predicted bar growth was to occur, that Captain Eads has not found it necessary to complete them as far out as they were located and partly built two years ago.

Perhaps more inexplicable than any is the assertion, on the part of General Humphreys, to the effect that the "results actually attained at the South Pass disprove the views of Mr. Eads and confirm those of the Engineer Department." The General certainly cannot have read the report of Generals Barnard and Wright, made last January, which, after announcing the presence of a channel nowhere less than 200 feet wide and 22 feet deep, from South Pass, between the jetties, to the deep water of the Gulf of Mexico, says: "This result is so exclusively due to the jetties and auxiliary works that the auxiliary aid of appliances, if in such we include dredging machines, is utterly insignificant." Or if he prefers to ignore these statements of two distinguished officers of his own corps, he certainly must know, as a matter of common notoriety, that the heaviest draught ships are already using the jetty channel.

Captain Eads has published the letter to the Committee of the House, in which he answers General Humphreys' separate allegations in a way which leaves no two opinions concerning either the statements themselves or the motives which prompted them. It is a matter of regret that an officer of General Humphreys' rank and distinguished abilities should permit his prejudices so seriously to warp his better judgment.

**THE CARGO OF THE IDAHO.**—The cargo of the lost steamer Idaho furnishes an index of the current contributions of America to the Old World. It comprised 141 packages of agricultural implements; 77,000 pounds of bacon; 98 packages of clocks; 17,311 bushels of corn; 1,904 bales of cotton; 94 bales of hops; 58 horses; 200 tons of fresh meat; 75 tierces of salt meat; 2 cases of machinery; 5 pianos; 12 kegs of printing ink; 25,258 bushels of wheat; 12 packages of manufactured wood.

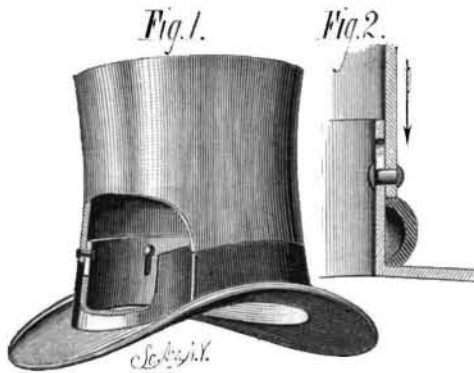
A NOVEL application of the electric light is proposed by Professor Edison. His plan is to make a diminutive light apparatus, and inclose it in a glass globe of such size as to be easily swallowed. He will connect it with a suitable battery, and he expects to be able to witness the process of digestion, and to see with more or less distinctness the operations of the internal organs.

**DON'T SWALLOW CHERRY PITS.**—A man died in Vermont the other day, after suffering from dyspepsia for twenty years. Some peculiar circumstances in his case led to a post mortem examination, which

revealed thirteen cherry stones imbedded in the lining of the stomach, causing a thickening of the walls of that organ some three fourths of an inch, and ultimately the man's death. It was the opinion of the physicians that the stones had been there many years.

**IMPROVED YIELDING HAT.**

The annexed engraving represents an improved hat for firemen, policemen, and others, by which the force of falling bodies or of blows may be broken sufficiently to protect the head against injury. The brim is made separate from the hat body, and is provided with a raised portion which is



fitted to the head. The body slides on the rim portion as shown in section, Fig. 2, and is guided by slots and pins, and supported by a cushioning spring. This device was patented through the Scientific American Patent Agency, February 26, 1878, by Mr. José M. de Celis, of New York city.

PROFESSOR EDISON intends to employ his telephone for distinguishing sounds within the thorax and other cavities of the body, in place of the stethoscope. It will be of great advantage in medical schools, as a single telephone will be applied to the subject, and as many receiving instruments as may be required will be placed in communication with it for the use of students.

**NOTES OF PATENT LAW—DECISIONS OF THE COURTS.**

The Atlantic Giant Powder Company brought suits against Goodyear and Townsend for infringement of Nobel's issued patent, for an explosive compound consisting of a combination of nitro-glycerin with infusorial earth. The question presented on the motion for preliminary injunctions was, whether the pulverulent powder compounded of the usual proportions of nitrate of soda, charcoal, and sulphur, as used in the "Vulcan blasting powder," in combination with nitro-glycerin, was, for the purposes of, and in that combination, the equivalent of "the substance" described in the Nobel patent as possessing "a great absorbent capacity, and which at the same time is free from any quality which will decompose, destroy, or injure the nitro-glycerin, or its explosiveness;" thus, when combined with nitro-glycerin, forming out of the two ingredients "a composition which, without losing the great explosive power of nitro-glycerin, is very much altered as to its explosive and other properties, being far more safe and convenient for transportation, storage, and use than nitro-glycerin."

The preferred form of this substance, as described by Nobel, was the *Rieselgurgh*, or infusorial earth. The substance used by the defendants, in combination with nitro-glycerin, was a mealed powder of nitrate of soda, charcoal, and sulphur, in proportions the same as in some gunpowder in common use in granular form.

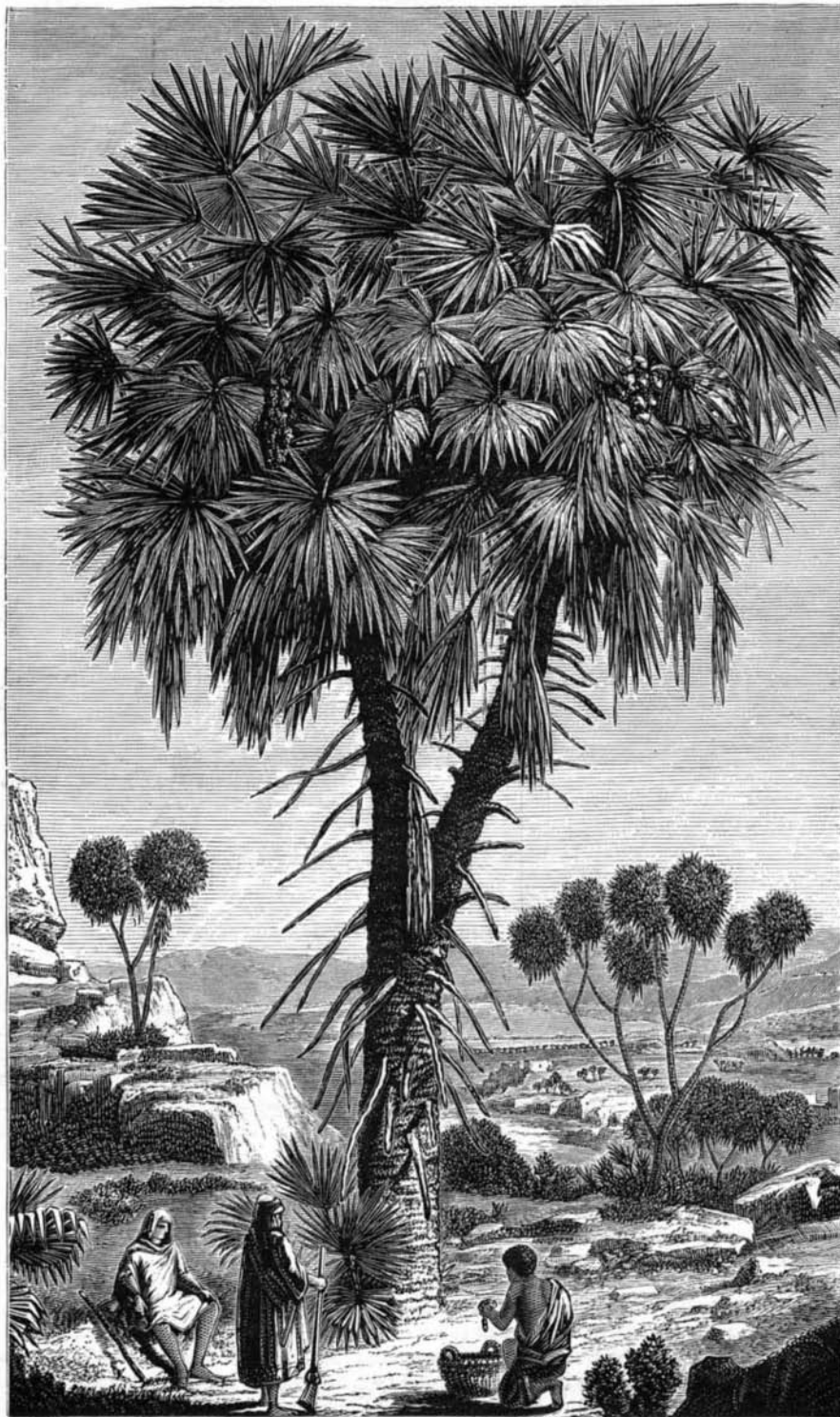
It was not contended that the substance itself used by the defendants did not possess, in the combination, every property claimed for the infusorial earth in the dynamite patent, or that the combination of it with nitro-glycerin, as "Vulcan blasting powder," did not possess every attribute and property in a greater or less degree possessed by dynamite.

The contention of the defendants was, that the only object and aim of Nobel's invention, as patented, was to render nitro-glycerin safer in handling and transportation; that there was no intent to augment its explosive force; that, on the contrary, the solid substance exerted no influence and remained as inert matter, while the object of the manufacturer of the Vulcan powder was stated to be "to render the explosion and combustion of gunpowder instantaneous."

It was further argued by the defendants that Nobel in his original letters patent described his absorbent as an "inexplosive" substance, and that if the omission of the term "inexplosive" in the reissue enlarged the scope of the invention, the reissue itself was void; and that if the reissue was to be construed in connection with the original, and for the same invention, it must be limited to the use of absorbents as equivalents which were inexplosive.

The court, however, in disposing of the first objection raised by the defendants, holds that evidently it was not the sole or principal object of the defendants, in manufacturing Vulcan powder, to render the explosion and combustion of gunpowder instantaneous. That if this was the only object of the combination, why begin the process by substituting for the granular gunpowder, so highly explosive, a mealed powder of the same ingredients in a pulverulent state, and of a lower degree of explosiveness than grained powder? The fact was that gunpowder, when used as an absorbent in the Vulcan powder, fulfilled every condition and performed every function of the absorbent in Nobel's patent, besides possessing the additional function, at the time of the explosion, of co-operating, by means of its conversion into gas, with the nitro-glycerin, in rendering the rock, instead of remaining, like the infusorial earth, an inert substance. This latter fact, however, rendered it no less an equivalent. The legal reports are full of cases proving that, when a substitute is used for one ingredient in a patented combination which has every property and performs every function of the original in the combination, it does not cease to be an equivalent because, in addition, it does something more and better.

In disposing of the second objection the court holds that the word "inexplosive" was applied in the original patent as a term of description to a substance only preferentially used. The word was used in the original patent to describe substances which, as compared with nitro-glycerin, were inexplosive by concussion, which would not of themselves explode under those conditions which render nitro-glycerin so dangerous and unsafe, and which, inexplosive in themselves under those conditions, when combined with nitro-glycerin, would make the combination a compound which would also be inexplosive except under such conditions as were not inconsistent with substantial safety in its use for blasting and similar purposes. The word was properly omitted in the reissue, not for the purpose of including equivalents which were not



**THE DOUM PALM.**

within the scope of the original invention as described, but as an ambiguous expression not consistent with the other words in the specification, which clearly described the absorbent, its properties and functions, all of which properties and functions might appertain to a substance explosive under some conditions, but inexplorable under those conditions which made nitro-glycerin explosive by concussion. The court grants the preliminary injunctions asked, holding that the complainants are not limited to treat as infringements the use of such equivalents only as are actually inexplorable, but they are entitled to the exclusive use of such equivalents as are inexplorable as compared with nitro-glycerin, and which, while complying with the other requisites of the infusorial earth in the combination, will also, when combined with nitro-glycerin, form out of the two ingredients a composition which, without losing the great explosive power of nitro-glycerin, is more safe and convenient for transportation, storage, and use than nitro-glycerin.

#### New Inventions.

Mr. S. P. Cox, of Brooklyn, N. Y., has patented an improved form of Bracelet made of stone, jet, or other material, but especially of stone. It consists in a series of blocks or plates strung upon spring wires, having sufficient elasticity to hold the bracelet upon the arm when the edges of the bracelet are brought together and secured by a fastening similar to a butt hinge. The same inventor has also designed a Locket, so constructed that no metal is visible except the eye or loop to receive the guard.

A new Fire Escape, the invention of Mr. J. S. Shaw, of Joplin, Mo., consists of a folding ladder, made of links and rounds bent of one piece of wire, which is stowed compactly in the hollow sill of a window and suitably secured at its upper end, and is always ready for use.

Mr. Sylvester Snell, of Watertown, N. Y., has patented an improvement upon that form of Animal Trap in which the weight of the animal upon a tilting platform is made to close the doors of the cage. The inventor adds an ingenious mechanical device, operated by the weight of the animal's fore feet, which unceremoniously precipitates him into a pit below.

An improved photographic Camera Shutter, invented by Mr. A. Johnson, of Kewanee, Ill., consists of an interior swinging shutter of novel construction, arranged to shut off the light passing through the camera tube, the object being to provide a means of opening and closing the tube without the knowledge of the sitter.

An improved Thill Coupling, recently patented by Mr. W. L. Wheeler, of Birmingham, Ill., is designed to admit of the thills or pole being readily detached when desired. To the axle is secured a thill clip, having lugs to receive the pin which fastens the irons of the thill or tongue. By means of a pivoted and slotted lever the pin may be easily withdrawn or locked into position by a key forming the outer end of the lever.

Mr. G. L. Reynolds, of Oakland, Cal., has made an improvement in the class of Window Screens, in which the upper and lower wire screens are attached at one end directly to the sashes, so that when the latter are raised or lowered to open them, the screen will be extended over the opening and thus exclude flies, mosquitoes, or other insects without excluding air. The improvement consists in journaling a screen roller in a groove formed in the meeting rail of a sash, and in attaching to said screen roller one balance cord of the journal of the roller and the other balance cord to the sash.

An improved School Desk, patented by Mr. J. P. Pies, of Spades, Ind., belongs to that class of desks which are so made as to be raised or lowered at will. The improvement consists in a new device by which the desk can be readily adjusted and firmly secured in the desired position.

A new Leather Dressing Compound, for boots and shoes, harness, trunks, etc., designed to impart a lustrous black gloss, as well as to preserve and protect the leather, has been patented by Messrs. Norman Quinlan and J. H. Quinlan, Jr., of Glen Falls, N. Y. It is made of shellac, ivory black, alcohol, castor oil, and turpentine in certain proportions.

Mr. J. F. Johnson, of Yocum Station, Va., has made an improvement in Pen Holders, designed to render the pen yielding to pressure upon the point, and to adapt it to be carried in the pocket. It consists in arranging the pen socket in a tubular case, so as to slide freely, with a spiral spring behind the same, which tends to project the pen beyond the tube to its working position, the pen being retracted in the tubular case by means of a stud extending through a longitudinal slot in the said case, and secured by being turned axially into a notch.

Mr. David Healy of Los Angeles, Cal., has patented a Waste Trap designed to prevent the escape of sewer gas, to prevent siphoning, and to supply hot and cold water to

a basin through concealed pipes. It has two water seals arranged in a peculiar manner, and a float valve which when subjected to suction adheres more closely to its seat, thus preventing the removal of water from the trap.

An improved Blackboard arrangement has been invented by Mr. H. W. Eastman, of Baltimore, Md., in which the blackboard proper is pivoted in a frame, in which it slides up and down, so that it may be reversed in position to bring either side to the front. The special point consists in balancing the blackboard by means of a sliding frame adapted

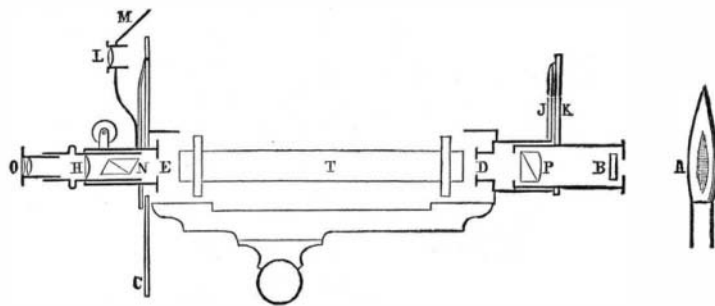


Fig. 1.—SACCHAROMETER IN SECTION.

for holding alphabetical or arithmetical tablets, said board and tablet frame being connected by ropes which pass over pulleys at the top of the fixed frame, in which the movable parts slide vertically; the arrangement being such that the blackboard is prevented from turning on its pivots when the tableholder is lowered into the required position behind it.

An Improved Buckle for harness, which may be disengaged from the strap or trace in connection with which it

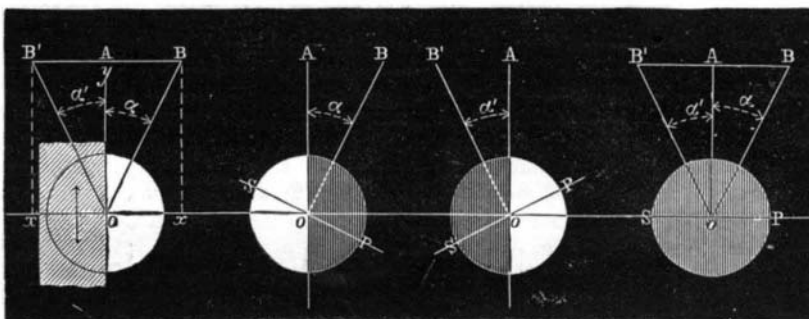


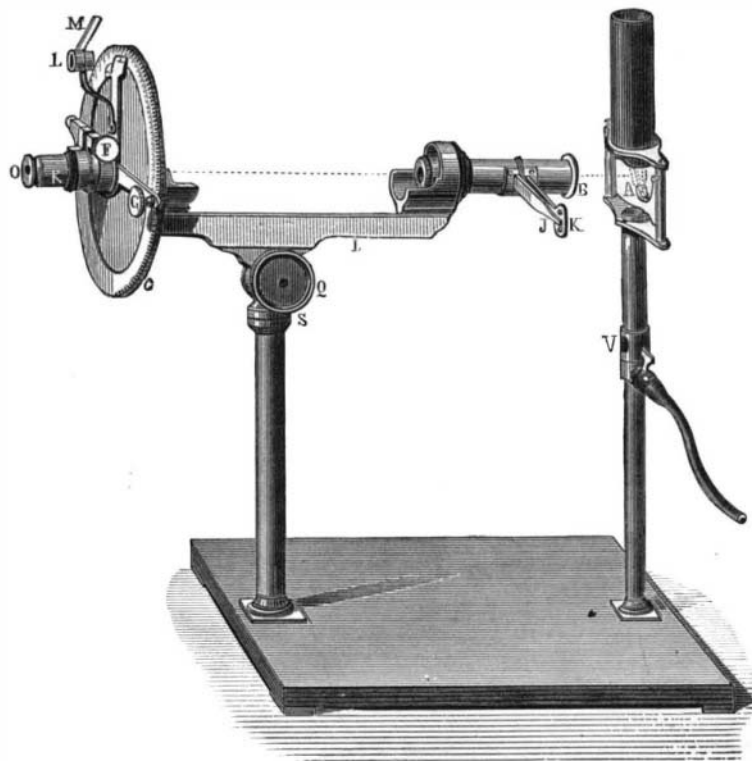
Fig. 2.

Fig. 3.

Fig. 4.

Fig 5

is used, without the necessity of drawing upon the strap or trace to release the buckle tongue, has been patented by Mr. R. J. S. Graham, of 79 Murray street, New York city (care of Edward A. Boyd). It has an open frame, which may be drawn together or spread apart by an adjusting screw, and has a movable bar which hooks over the sides of the frame when the buckle is in use, but is released, so as to liberate the buckle tongue, by turning the adjusting screw.



THE NEW LAURENT SACCHAROMETER.

Mr. J. W. McGarrett, Jr., of Nashua, N. H., has devised a movable Copy Holder for children when learning to write, the advantage of which is that the copy may be moved down the page as the writing progresses, so that the learner may always have his copy before him, instead of using the line last written as a copy for the next. The holder is made of tin, wood, or other suitable material, and has flanges upon its edges to receive the copy slip, and feet which support it at the right inclination.

#### THE NEW LAURENT SACCHAROMETER.

We are indebted to *La Nature* for the annexed illustrations of an improved saccharometer, by which, it is stated, observations of unusual accuracy may be made. The apparatus is represented in longitudinal section in Fig. 1. A is a yellow monochromatic flame, placed at an invariable distance from the instrument. The burner is constructed so as largely to augment the intensity of the flame. B is a diaphragm containing a plate of bichromate of potash, which absorbs the violet and blue rays which exist in the flame, while allowing the useful yellow rays to pass. P is a bi-refracting prism, in which the second image is diverged to one side and intercepted by diaphragms. It turns on the axis, O E. D is a diaphragm carrying a thin plate of quartz parallel to the axis, the thickness of which is one half wave for the yellow rays. This is fixed and covers but the half of the diaphragm. E is another diaphragm; N, the analyzing Nicol; H, the objective; O, concave eye piece. The system, O H N, is mounted on an alidade, which turns on the disk, C, around the axis, O E. T is the tube containing the solution to be tested. C is a graduated disk having one or two divisions; one especially for sugar, the other in half degrees of the circle for any rotary substances. L is a lens for reading the scale.

M is a mirror throwing the light of the burner on the divisions and thus obviating the need of any additional light. The new optical disposition consists in the polarizing system, which is composed of two distinct parts—the bi-refracting prism, P, which turns, and the diaphragm, D, which with its half plate of quartz is fixed. In Fig. 2 this diaphragm is represented enlarged, as it is seen on looking into the instrument. The left half is covered by the quartz plate, the axis of which is also parallel to the line of separation, O A, and the right half being open allows of the passage without deviation of the polarized light from the polarizer, P, Fig. 1.

Let it first be supposed that the plane of polarization is parallel to O A. If this be left fixed and the analyzer, N, be turned, there will be a progressive passage from total extinction to maximum illumination, and the two halves of the disk will always remain equal to each other in intensity exactly as if the quartz plate did not exist. The plate being always fixed, let the polarizer be turned so that the principal section comes at O B, making with the axis, O A, any angle,  $\alpha$ . Let a vibration occur in the plane represented by O B. This vibration, represented in length by O B, may be decomposed into two others

—one, O Y, parallel to the axis, O A, of the plate, and the other, O X, perpendicular. This vibration will pass without deviation on the right side, but on the left it will be deviated by the plate. The ordinate, O Y, being parallel to the axis of the quartz will not change sign, but the abscissa, O X, which is perpendicular thereto, will change sign, and will come to O X' at  $180^\circ$ , since the plate is a half wave in thickness; so that at the left side the vibration resulting will occur in the plane, O B', making with O A an angle,  $\alpha'$ , symmetrical and equal to  $\alpha$ . This plate therefore has for its object to determine at the left side a principal section, O B', placed with relation to the line of separation, O A, symmetrically to the principal section, O B, on the right side. If the polarizer be left fixed in this position, and the analyzer be turned so as to render the principal section, S P, perpendicular to O B, Fig. 3, there will be total extinction at the right side, but partial at the left side, as shown. Reciprocally, if the principal section, S P, of the analyzer is perpendicular to O A (Fig. 4) there will be total extinction on the left and only partial on the right side. Finally, if the section, S P, be perpendicular to O A (Fig. 5) there will be partial extinction for both sides and equality of tone, since  $\alpha = \alpha'$ .

If the analyzer be left fixed in this last position, and the polarizer be turned so that the principal section makes with O A angles varying from  $0^\circ$  to  $45^\circ$ , the two semi-disks will always remain relatively equal in intensity, but together will change their common intensity, passing from complete extinction to maximum illumination. In other words, if the apparatus is regulated at zero—that is to say, at the equality of tones—and if the polarizer be turned while their relative intensity will not be changed, their common one will pass through all degrees.

If, however, after causing the polarizer to make any angle whatever with O A, and leaving it fixed in this position, the analyzer be turned over a small angle in either direction from S P, Fig. 5, then the equality of tones in the two semi-disks is at once broken, and one becomes dark and the other light. This sudden change allows of the determination, with great precision, of the position of the analyzer; that is, of the zero of the instrument when no substance is interposed. If by interposing a substance possessing rotary power the equality of tones is destroyed, it is necessary to turn the analyzer until this equality is re-established, and the angle over which the analyzer is moved shows the rotary power of the substance.