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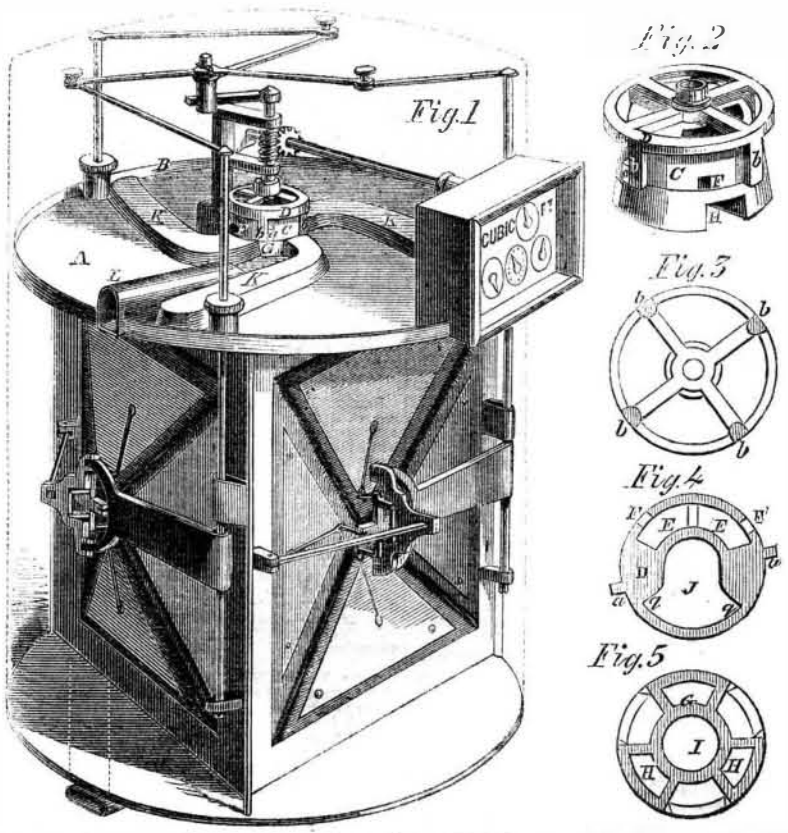
Light—The Law of Reflection.

By the reflection of light is understood that property by which, when light falls on any smooth surface, it is thrown off from it again. There is a fixed law of optics as to the direction in which the rays are thrown off, but this law it is not necessary here to explain. The result of it is sufficiently familiar to all. How often have we beheld, with delight, the surface of the calm sea at sunrise, with a long path of light glittering on its waves between the eye and the sun! How often have we admired the golden clouds of morning reflecting the sunbeams before the luminary itself has risen above the horizon! These and innumerable other phenomena have their birth in the law of reflection. Now it is this law which makes our eyes of use to us. Every object in nature is seen by reflected light except the sun, the stars, and other luminous bodies which are visible by their own rays. Every other object is seen by the light which is thrown off from it, and which forms a picture or image of such object in the eye of the beholder. The mountains—the lakes—the clouds overhead—the ocean below—the sparkling rivers—the gloomy wood—the countenances of friends—the walls of our apartments—the perception of these and all other objects of sight we owe to light reflected or thrown off from them. But to go further: were it not for this law, not only should we perceive nothing except luminous bodies themselves, but even at the hour of noonday, the whole surface of the earth and the waters would be as dark as night; in short, nature—as far as the sense of sight has anything to do with our perception of it—would be obliterated. To prove this only a single and and simple illustration is necessary. Black substances are called black because they do not reflect the rays of light; hence the impression on the eye of what we call blackness or darkness is nothing more or less than the absence of reflected light. So if all nature, like black substances, reflected none of the rays of light, everything would be involved in common gloom.

We are aware that these simple facts regarding the law of reflection are not new, but, we doubt not, many of our younger readers will be enlightened on this subject for the first time by the plain statement here set forth.

SUPPLEMENT.—It was our intention to have issued another illustrated supplement with this week's number of the SCIENTIFIC AMERICAN, but we have been deterred in our good design by the care and attention required in the fitting up and removal into our new office. We shall not disappoint our readers in this respect.

LLOYD'S DRY GAS METER.



On one or two occasions we have given our opinion of the gas companies, and we have no need to reiterate it here, but for some reason or another, they pretend to have a great objection to the dry gas meter, and will not supply the consumers with them if they possibly can avoid it. As the dry meter is more correct and less trouble than the wet one, the consumers should insist upon having them placed in their houses.

The subject of our engravings is an improvement in the dry gas meter, which renders it more perfect, and much less liable to accident than it has hitherto been.

Fig. 1 shows the interior of the meter, the dotted lines showing the outer case, which is removed. Fig, 2 is a perspective view of the rotary valve that is placed on the top, and which constitutes the improvement. The other figures are detached views of the valve.

A is the top of the chambers and lower surface of the gallery of the meter, provided with a rim, B, and C is the circular valve by which the gas passes in and out of the six compartments of the meter in which it is measured. C is provided with openings, E E (seen in Fig. 4), through which the gas escapes into the gallery of the meter to supply the burners, and there are two notches, F F, in C, to break the continuity of the lower surface. C rests upon a seat, G (Fig. 5), provided with passages, H, that communicate with the interior of the cells. When the valve, C, is placed on G the lower surface of C fits accurately to and slides upon the seat, except at the notch, F, the edge of which being sharp scrapes off any resinous or other deposit that might remain from the gas, and thus interfere with the working of the valve, and the surface of H is also kept clean the same way, by their sharp edges, around the central aperture, I; connected with I is a central tube running down through the center of the meter, and terminating in a horizontal table closed by a screw cap. The gas enters the meter through L, from which it passes into this centre tube, and thence up through I in the valve seat into the central depression, J, in the valve, C (seen in Fig. 4), and thence alternately through one or other of the passages, H, into the compartments of the meter. As the gas passes into the central tube vapors will be condensed, and they can at any time be removed by unscrewing the cap in the table before mentioned. The rotary motion is given the valve by means of a carriage, D, provided with arms, *b*, that catch against projections, *a*, on C. This is moved by a crank connected by levers with the expanding sides of the meter. The passages, K, communicate between the valve and the inner chambers. This meter cannot get clogged by deposits or moisture, and it is a great improvement on the common one.

It was patented June 22, 1588, by the inventor, C. C. Floyd, of Philadelphia, Pa., who assigned it to Hopper & Gratz, of the same place. Any information may be obtained by addressing Code, Hopper & Co., Philadelphia, Pa.

Greatness of Little Things.

Scientific research iterates and reiterates one moral—the greatness of little things, and the importance not only of the minute study of facts, but of the study of minute facts. One can imagine the contempt with which the "practical men" of the last century listened to the news that a bitter controversy was raging between two Italian philosophers as to the reason why a frog's leg twitches under certain circumstances; and yet therein lay the bud of the electric telegraph and electro-plating, and numerous other undertakings in which the practical man of the present day, though as averse as his ancestors to every investigation whose fruits are not immediately visible, is very happy to invest his money. The study of snow-balls, piecrust, and squeezed wax has led the physical philosopher to comprehend two of the greatest natural phenomena—the cleavage of rocks and the structure of glaciers. A century ago, the collecting of fossils was regarded as an occupation of about the same dignity as the accumulation of old china. Now, the coal miner risks his capital upon the strength of the evidence they afford, and the landed proprietors of some of our eastern counties pocket many thousand pounds every year by selling the phosphatic fossils whose nature was first pointed out to them by a country clergyman who happened to be a man of science. And not only does the gradual widening and perfecting of our view of nature bring with it a respect for the influence of the study of minute facts on the advancement of knowledge and the bettering of man's estate, but it tells us that, apart from all consideration of man and his wants, minute and seemingly most insignificant agents have played a mighty part in the history of our globe.—*Engineer.*

Merits of Gutta Percha.

On page 170 of the present volume of the SCIENTIFIC AMERICAN, there is published a letter from I. H. Norris, in which it is stated that its author had seen gutta percha which had become quite brittle when used as a covering for submerged wires. It is stated that it is liable to crack open as if cut across with a knife, when bent or made to take a short turn. In reference to this statement, Mr. S. C. Bishop, No. 181 Broadway, this city, asserts that *pure* gutta percha will not crack as represented; and he has shown us some telegraph wires which were covered with it five years ago, the coating of which appears to be as perfect as when first put on. The wire which Mr. Norris saw, he thinks, must have been coated with an adulterated article, not *pure gutta*,

Mr. Bishop manufactured the cable covered with hemp to which we alluded on the page referred to above.

Curious Experiment.

M. Groux, the man with the thoracic cavity which admits of an inspection of the internal mechanism, has had an electro-magnetic machine made which, applied through the orifice, tinkles a bell with every pulsation of the heart. The machine was made by Mr. Farmer, of the Alarm Telegraph office. Recent experiments were made in connection with the exact and delicate apparatus in the Observatory at Cambridge, The operating forces were divided, one portion taking their post at the Observatory, the other in Boston. The principle agent, M. Groux, himself, being here, the heart's impulses were transmitted over the electric wires, and instantaneously recorded at the Observatory. -*New York Journal of Commerce.*

Removal of the Scientific American Office.

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MUNN & CO.,
No. 37 Park-row (Park Building),
New York City.

N. B.—Parties who have addressed us at our former office, without knowing of our removal, need not have any fears as to the receipt of their communications, as we have a box at the Post Office, and the express-men know where to find us.