

Stereoscopic Portraits by a Single Camera.

We have just taken, by means of a single 4 x 5 camera, some stereoscopic portraits of so excellent a quality and by means so simple as cannot fail to interest our readers and cause many of them to do likewise after they read our description.

Every one is, of course, aware of the existence and nature of an office chair, the seat of which rotates upon a central axis—usually a screw—of the same nature as that of a piano stool. Now if a sitter be posed in a chair of this nature, it stands to reason that when a camera is placed at a distance of a few feet away, the mere act of rotating the chair upon its pivot, and with it the sitter, will cause the latter to be presented to the lens under circumstances of horizontal displacement extending to 360 degrees, or equal to the entire circle.

Having posed the sitter according to taste, and being provided with a double dark slide containing two plates, the first exposure is made and the sitter enjoined to remain perfectly still while the chair is rotated to an *exceedingly slight extent*—an extent, indeed, that shall not be more than is barely appreciable—and another exposure made on the second plate. When developed and printed from, these negatives will yield proofs which shall be truly stereoscopic.

Care must be taken that the rotation of the sitter be not carried too far, else will the effects obtained be vulgarized by the exaggeration of the relief. It is so very easy to produce this artificial relief, and the temptation to do so is so great, that the photographer must be on his guard against indulging in this trick, which, while calculated to startle the spectator, is as "untrue in nature as in art."

It cannot, however, be denied that some exceedingly funny and grotesque effects can be obtained by indulging in an excess of this movement of the sitter in azimuth. We have witnessed immoderate laughter being elicited when the portrait of a person whose nose was naturally rather large was presented for examination in the stereoscope, which showed it to project at least three or four inches in advance of his face. This effect was produced by bringing the camera within five feet of the sitter, and causing the chair to be rotated two or three degrees more than it ought to have been. In like manner may an individual whose face is rather thin be presented as decidedly hatchet faced, while the likeness otherwise remains so good as to cause ready recognition.

While experimenting in this direction, the photographer will not fail to notice what striking and novel effects can be obtained when a back view, either wholly or partially, of the sitter is focused upon the ground glass. If any readers who adopt the practice of photographic portraiture as *dilettanti* rather than as professionals will occasionally deviate from the regular habit of photographing their friends full or three-quarter face, and try instead, say, a full or three-quarter *back view*, it will afford an agreeable modification in the routine of their practice.

The method which we have just described of rotating the sitter in relation to a single lens camera, is one equally sound in principle as easy in practice for producing true stereoscopic effect in portraiture. But it must be noted that the stereoscopic effect is confined to the sitter only, and has no relation to him (or her) and the background. For this reason, the practice of stereoscopic portraiture by the means described should be confined to busts, and the backgrounds should be quite plain.—*Photo. Times.*

The Bitumen of Judea.

An interesting investigation of the nature of this natural product of Judea and the Dead Sea has been made by M. B. Delachanal, who has communicated his results to the French Academy of Sciences. It is employed in Palestine as an insecticide on the vines, and hence the recent attention it has attracted in France, where *savants* are still engrossed with the problem of fighting the phylloxera. Some kilogrammes of the bitumen were procured from the French consul at Jerusalem by M. De Lesseps, and on this M. Delachanal has operated. He finds the presence of a considerable quantity of sulphur in its composition. It is a deep brown color, nearly black, and of a friable nature. It contains 27 per cent of oil, which is nearly colorless and of the nature of petroleum. A solid paraffine can also be extracted from it. The result of these experiments is that the bitumen of Judea, if it prove efficacious as an insecticide, may also be turned to good account by the manufacturing chemist in the production of sulphur and illuminating oils.

The presence of sulphur in its composition appears to assign to it a mineral, not organic, origin. Should the Dead Sea Canal be constructed, it is probable that profitable trade may arise from this natural product.

NEW GAS ENGINE PUMP.

Our engravings represent the "Crown" gas engine, adapted for pumping purposes, now being manufactured by the National Meter Company, of 51 Chambers Street, this city. The smallest size is here shown, capable of pumping 200 gallons of water 50 feet high per hour, at an expense of one and three-fifths cents, estimating gas at \$2 per thousand

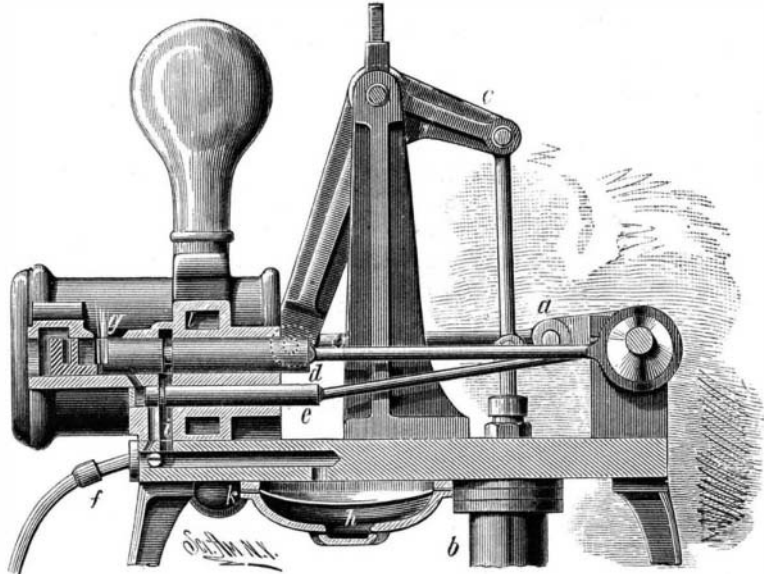


Fig. 2.—NEW GAS ENGINE PUMP.

feet. Fig. 1 is a perspective view, and Fig. 2 is an elevation, showing the valves in section. The engine frame is supported upon two legs above the base to make room for the pump, *b*. The power cylinder is placed horizontally upon one end of the frame, and the motion of the piston is communicated to the pump through the rocking arm, *c*, and the vertical rod operating the piston of the pump. The crank, *a*, is connected to the lower end of the rocking arm by a connecting rod. In the back of the power piston are two springs which are furnished with a central guide ring, into which the end of the piston rod enters. This end of the rod is convex and made of tempered steel, and rocks upon the face of the tempered piece. The piston rod is held against its seat by a spring bearing upon the end of a steel pin inside the rod, so that it is held in its place by the pressure of the spring. There is no sliding motion in this connection, but a rocking one; and the whole makes a flexible and fric-

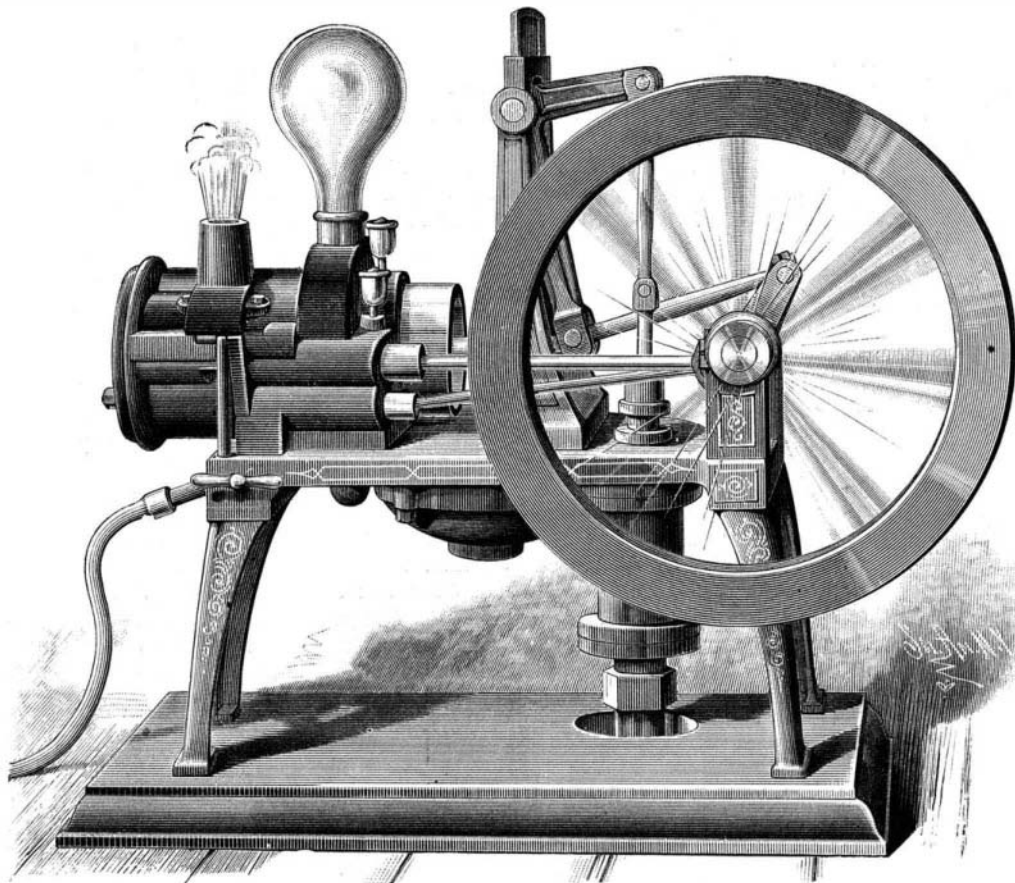


Fig. 1.—NEW GAS ENGINE PUMP.

tionless connection. All bearing journal pins are made of tempered steel, and are ground to size. The pump cylinder is of composition, the valves being of the best rubber composition for water valves. The water is forced or lifted through the upper part of the pump, thence through a cored passage in the frame to the chamber, *l*, in the cylinder. The air chamber serves to equalize the flow, and the water escapes through the outlet, *k*, on the opposite side of the engine from that shown in the engraving. A flywheel, which is not represented, in Fig. 2, gives steadiness to the motion.

The valves, *d* and *e*, are solid, and are fitted so accurately as to need no packing, the work to which they are subjected is so light that they will not require it. Air is admitted to the cylinder by the valve, *d*, while gas is admitted by the valve, *e*, to supply the charge, this valve also regulating the flow of gas to the lighter jet at *g*. At the instant the flow of gas and air to the cylinder is stopped, the valves close and the charge is exploded. The gas supply is received through the pipe, *f*. The action of the combined valves is positive and simple, and there are no loose working parts to get out of adjustment. The valves are operated by independent eccentrics on the main shaft. The engine occupies a floor space 8 x 21 inches, is 17 inches high, and weighs 100 pounds.

The company also manufacture engines for general use from a size suitable for driving a sewing machine, up. The engine can be seen in operation at Chase's, No. 12 Cortlandt Street, this city.

A Green Colored Sun.

A remarkable phenomenon has been observed lately at several places in the Madras and Bombay Presidencies, and has caused much interest, mingled with not a little alarm among the superstitious. For some days the sun presented a distinctly green color. Several explanations have been put forward, of which the most plausible appears to be that offered by the Government Astronomer, that it is due to the passage across southern India of clouds of sulphurous vapor from the Java volcanoes.—*London Times.*

New United States Magazine Gun.

The Chaffee-Reece magazine gun is one of the three species of arms that were not long ago approved after thorough trial, by the United States Army Commission. This gun is now being manufactured at the United States works, Springfield, Mass. We have lately seen the original arm which formed the pattern for the manufacture. Prior to approval it was fired 8,000 times, and subjected to all the required tests of rust, sand blast, etc.; but it still looks almost as good as new. One of the peculiarities of this gun is the facility with which its magazine is loaded, the cartridges being simply dropped in at the breech, and the ease with which it is changed from magazine firing to the ordinary hand inserted cartridge. This is done by simply moving a small button. A single motion removes the discharged shell and inserts the new cartridge ready for firing. Altogether it is a remarkably effective weapon.

In the use of novel arms like this the modern soldier is required to exhibit on the battle field qualities of a totally different nature from those of the ancient warrior. The latter was valiant and effective in proportion as he worked up his nervous system to a condition of excitement and frenzy. But the soldier of the present day, using the repeating gun, must be thoroughly drilled in self-control. He must be extremely calm and collected in the presence of the enemy, take careful aim, fire no random shots; otherwise his superior arms count for nothing, his ammunition becomes rapidly wasted, and he has no recourse except flight.

Chronic Lassitude.

There are certain characteristics connected with a lazy man which are admirable. They excite in the twanging, jingling breasts of the nervously fidgety a feeling which borders on respect and is akin to awe. Your double geared fidgety man will spin all day like a top and run down in the cool of the evening on the identical spot on which he started off after breakfast. The man suffering from chronic lassitude will keep still, keep cool, keep in the shade, put in a full day's work resting himself, and arrive on time at sundown, cool, calm, and collected, without having once sweat under the collar or laid a hair.

The professional lazy man seems to eat, drink, and sleep with as much gusto and *sang froid* as his fidgety brother with the high pressure anatomy and patent double cylinder, fast, perfecting, hygienic apparatus, who gets hot in the box, and wears and grinds and cuts his life away like a piece of misfit machinery. The fact of the business is, the man of bustle wears his life away for the want of the oil of rest. The lazy man just soaks along like a handful of cotton waste in the oil cup of a box car axle.

BEEES taken to Florida become lazy, and make only as much honey as they need from day to day.

Catechu for Dissolving Boiler Incrustations.

Berlin is in possession of a pneumatic postal system, whereby letters can be sent through tubes by compressing the air behind or exhausting it in front of the package. Power is, of course, required, and is furnished as usual by steam.

In the selection of tubular boilers, says the *Deutsche Industrie Zeitung*, it was assumed that the water supplied by the Berlin water works was as free as possible from salts that produce incrustations, for the tubes lie so close together that it is almost impossible to clean the boilers.

After the boilers had been running a few months, however, it was found that a very hard incrustation was forming, that had already reached a thickness of 1½ inches. In consequence the boilers had to be cleaned every two months during the first two years that they were in use, and this was no small difficulty, for it had to be cut out. This induced them in the third year to try the experiment of adding pure catechu to the feed water. Eleven pounds of catechu were put in a boiler that had been well cleaned, and spread out over all the plates exposed to the fire, and each boiler was run eight weeks. At the end of that time there was no trace of any hard incrustation, but merely a slime that was easily removed.

This process has now been in use for four years in all the steam boilers used by the pneumatic dispatch, so that if the catechu has any injurious effect on the boiler or the machinery, it would have shown some trace of it before this time. This is by no means the case, nor can it be, for the quantity added is extremely small in proportion to the amount of water evaporated. The boilers in question evaporate, on an average, in the thirteen working hours, four cubic meters (about 140 cubic feet) daily, and only receive 11 pounds of catechu every two months, so that there is only 1 gramme of catechu to 48 kilos of water, or 1 to 48,000.

The catechu forms a paste or dough in the boiling water and rests on the plates over the fire; but as the stream of feed water is also directed to that place, it always comes in contact with fresh feed water.

It is true that catechu had been used with other chemicals years ago under the name of "incrustation powder" (*Kesselsteinpulver*), but this mixture exhibited the action of pure catechu only to a slight extent, and besides this it was added every day and required special feeding apparatus, so that it was very expensive.

SACRED EGYPTIAN SCARABÆUS.

The sacred Egyptian scarabæus (*Ateuchus sacer*) is in a biological as well as in an archaeological sense the most interesting beetle which inhabits the countries of the Mediterranean. It has been made famous by the honors paid to it by the ancient Egyptians; it played an important part in their animal worship. It is represented in their hieroglyphics, and displayed upon their monuments, and, hewn from stone in colossal proportions, was placed in their temples. Adrian speaks of it, and Pliny says, "This beetle makes monstrous pills of manure, rolls them backward with its feet, lays small eggs in these balls, from which beetles emerge, the ball serving as a protection to the young."

In cases of fever, besides the means employed by medical science, it was thought to be efficacious to bind on one of these beetles.

The head is semicircular with six deep indentations. These beetles fix upon a piece of manure, preferably cow dung, bear it away from the heap, and knead it into an irregular ball, in which the female deposits an egg. After they have made the ball, which is often larger than themselves, they roll it to a convenient spot, using their hind legs to direct the ball, and the other four legs for locomotion, so they seem to be standing on their heads, as the hind legs are elevated to guide the ball. Often one of the beetles pushes the ball with its head. This ball, which at first was uneven and soft, becomes, by much rolling, firm and smooth. They then dig a deep hole, in which they bury the completed ball. The filling up of the hole with earth finishes their wearisome labor, which was necessary to prepare a place for their young.

A second and a third egg require the same labor. At last, enfeebled by their labors, the beetles remain near the place where they have buried the balls and die. New life is developed in the buried balls, and the larva, as it emerges from the egg, finds a rich supply of provisions, by means of which it attains its full growth. It takes several months for the development of the larva. The next spring the beetles come forth from their birthplace, and the young, following the example of the parents, roll up balls in their turn.

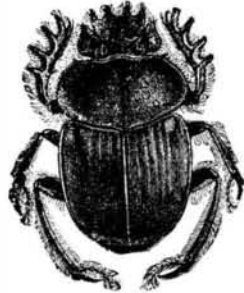
A German artist in one of his excursions into Italy observed a beetle employed in rolling a ball upon uneven ground. Unfortunately the ball rolled into a hollow, and the beetle exerted itself to the utmost to roll it out again; but

finding its efforts in vain it went to a neighboring manure heap and disappeared in it, but soon came forth again accompanied by three beetles. All four labored with their united strength, and at length succeeded in rolling the ball from the hollow. Scarcely were their efforts crowned with success than the three assistant beetles left the place and returned to their dwelling place.

Beetles possessing similar habits are found in almost every part of the globe, but they are not all equally skillful in the construction of the balls for containing their eggs.—*From Brehm's Animal Life.*

NATURAL HISTORY NOTES.

The Constancy with which Insects Visit Flowers has recently been the subject of an investigation by Messrs. A. W. Bennett and R. W. Christy, and the results of their observations



SACRED EGYPTIAN SCARABÆUS.

are printed in the *Journal* of the Linnæan Society for August 14. Although very interesting the subject is not new, Aristotle having made the assertion that "during each flight the bee does not settle upon flowers of different kinds, but flies, as it were, from violet to violet, and touches no other species till it reaches the hive." Messrs. Bennett and Christy, however, did not confine their studies to the bee family, but extended them to various species of Lepidoptera and Diptera, and have placed on record a large number of interesting details. With respect to butterflies, Mr. Bennett thinks that, upon the whole, they exhibit but a small degree of constancy in visiting flowers, though the majority of those upon which they were observed to settle were either yellow or pink; and, after settling upon one of these colors, they appeared to show a marked tendency to adhere to it. Two species of Syrphidæ, or "hover flies," also showed little constancy, though this may be accounted for by the fact that these insects are rather consumers than carriers of pollen. But the Apidæ, or bee family, exhibited much greater constancy. Thirty-three observations were made upon different species of *Bombus*, or "humble bee." In four instances the bee visited the flowers of three distinct species, irrespective of color; in six instances the flowers of two species were visited, the

flowers of the saw-wort (*Serratula tinctoria*), obviously rejecting those of the knapweed (*Centaurea nigra*), which are not unlike them in general appearance, and which are of nearly the same color. It is an interesting circumstance, to which Mr. Bennett calls attention, that the constancy of the insect appears to be in proportion to the part performed by it in carrying pollen from flower to flower. Mr. Christy's observations are confirmatory of those of Mr. Bennett. He considers the hive bee to be perfectly methodic in its habits, at any rate while there is a fair supply of flowers, though when these are scarce it may not be quite so scrupulous. He also thinks that humble bees show a fairly high degree of constancy. The Lepidoptera observed by him were not so numerous as those watched by Mr. Bennett, but they seemed to exhibit more constancy.

"A much larger number of observations," says Mr. Bennett, "is, however, needed in order to determine with certainty any general law; and especially a careful microscopic examination of the pollen attached to the probosces, mandibles, legs, and under side of the abdomen and thorax. As regards preference for particular colors, the Lepidoptera paid, while under observation, 70 visits to red or pink flowers, 5 to blue, 15 to yellow, 5 to white; the Diptera, 9 to red or pink, 8 to yellow, 20 to white; the Hymenoptera, 203 to red or pink, 126 to blue, 11 to yellow, 17 to white."

Influence of Position upon Seeds.—A paper with this title was read by Dr. E. L. Sturtevant at the recent meeting of the American Association. The "position" referred to in the title is that of the individual seeds grown on a spike. The object of the experiment was to ascertain the difference in germinating power between seeds from the middle and from the ends of the spike. In experiments conducted at the New York Agricultural Experimental Station last winter it was found that, on an average, 91 per cent of butt-kernels, 88 per cent of central kernels, and 98 per cent of tip-kernels of flint corn germinated. Other experiments gave the following results: Of the butt-kernels planted, 79 per cent germinated; of the centers, 84 per cent; and of the tip-kernels, 86 per cent. For flint corn, the tip-kernels have the strongest vegetative power.

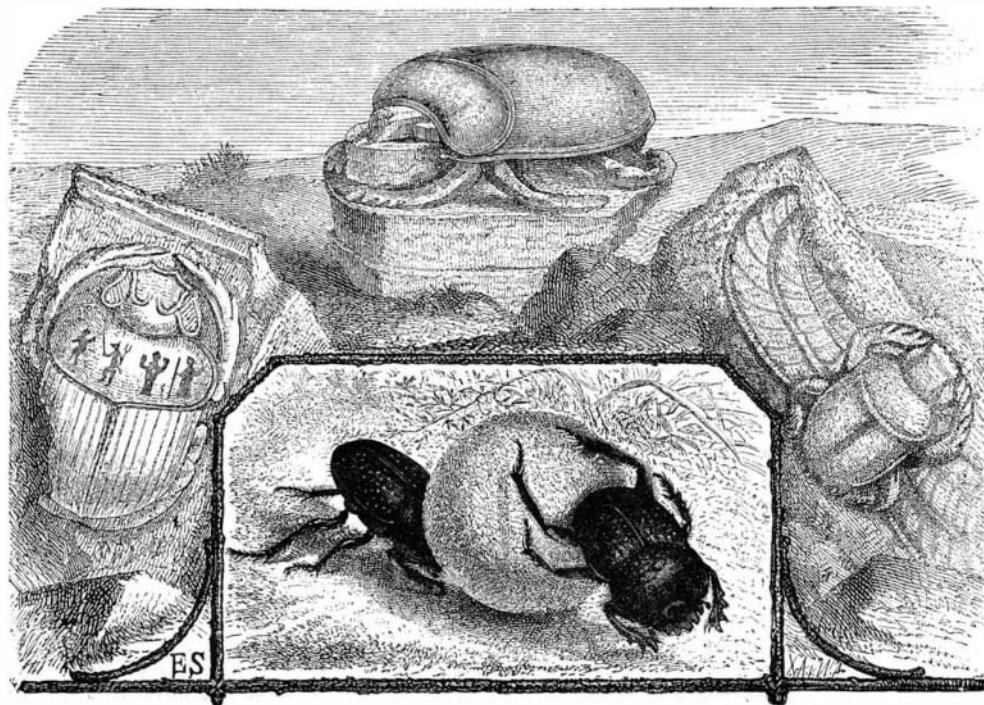
The Gardener Bird of New Guinea.—The gardener bird (*Amblyornis inornata*), a native of the Arfak Mountains in New Guinea, and the first report of the existence of which was brought to M. Bruijn by Malaysians, appears from the studies of M. Beccari to excel the Australian bower birds (to which it is allied) in the erection of a pleasure bower. The center of its edifice is formed by a small shrub in an open spot in the forest. Moss is piled up around this, and then a number of branches plucked from an epiphyte are planted in the soil in an inclined position, so as to form the walls of a conical hut, which is entered through a small aperture. These branches continue to vegetate for some time. In front of the entrance the bird makes a lawn of tufts of moss carefully separated from adhering pebbles, particles of wood, or other plants. Upon this green carpet he strews the violet fruits of *Garcinia* and the flowers of a species of *Vaccinium* growing near, renewing these as they wither.

Selenotropism of Plants.—Mr. Ch. Mussat (*Comptes Rendus*, xcvi., page 663), struck by the heliotropic movements of plants, has made some experiments on the influence of the moon. He sowed seeds of plants noted for their sensitive properties, such as *Lens esculenta*, *Ervum lens*, and *Vicia sativa*. When the plants were a few centimeters in length they were placed in the dark. The branches thereupon became delicate, long, and white, while the leaves were tinged with yellow. On the 22d, 23d, and 24th of February, when the sky was exceptionally clear, they were exposed to the direct light of the moon from 9 P. M. to 3 A. M. Almost immediately the branches became curved, and presented their concavity and terminal bud toward the moon. The bud seemed to follow the moon, and, when the plants were placed at a window with a western aspect, a fresh movement was observed, and this continued until the moon disappeared behind the hills.

M. Mussat proposes to call such movements *selenotropie*.

The Oregon.

The Guion fleet of steamships has been enlarged by the addition of the Oregon, a steamer which is 520 feet long, 54 feet wide, 40 feet 9 inches deep, and has a tonnage of about 5,000 tons. As accommodation is provided for 542 passengers, the arrangements for ventilation must be proportionally effective. The cabins, staterooms, dining rooms, and steerages are ventilated by means of twenty-six patent air pump extracting ventilators and twenty patent down casts. They are all of 24-inch diameter, with 12-inch pipes. By means of these appliances there can be no doubt that the traveling public will have all the sanitary comforts at sea that they can have in a well arranged hotel on shore, and this is the principle which the owners of the fleet have in view.



SACRED EGYPTIAN SCARABÆUS.

color of which was nearly the same; and, in twenty-three instances, the bee confined itself to a single species, though the plants chosen by the different bees were of the most various kinds and colors—some shade of pink, however, largely predominating. There could be no doubt as to this constancy being intentional, the bee frequently traversing a considerable distance, without alighting, so as not to mix its pollen. But it would appear as if color were not the sole guide, since both observers found that the same bee would visit white and purple foxgloves indifferently, while passing by flowers of any other species. The common hive bee was observed six times, and only upon one occasion was it seen to visit the flowers of more than one species, and then it made one visit to the blue scabious (*Scabiosa succisa*), followed by nine in succession to the pink centaury (*Centaurea scabiosa*). Another bee paid twenty-four consecutive visits to