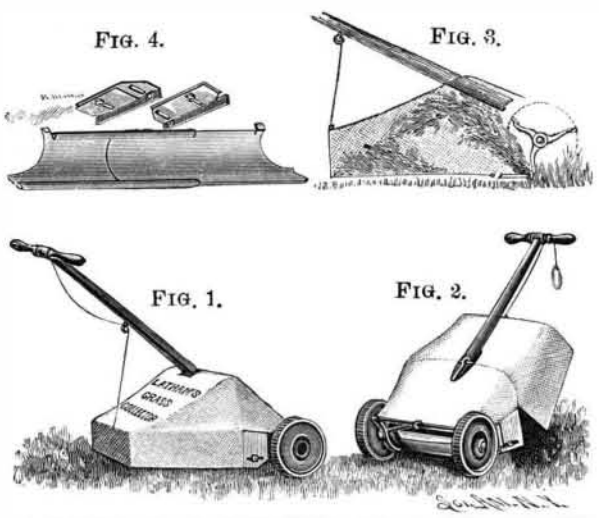
LATHAM'S GRASS COLLECTOR FOR LAWN MOWERS.

Every one who has used a lawn mower knows that the most disagreeable and most unsatisfactory part of cutting a lawn is raking the grass. The lawn usually looks well after the mower has passed over it, but the rake is likely to tear and pull up the roots of the grass more or less and make the lawn look rough. If the grass is gathered in a collector, the lawn is left smooth and velvety, and the grass thickens until the



LATHAM'S GRASS COLLECTOR FOR LAWN MOWERS.S.

ground is completely covered with a thick green mat. The grass collector shown in accompanying illustrations does away with the disagreeable work of raking a lawn and does away with the rake entirely. The collector is made of canvas, with a galvanized iron frame, and is readily attached to the mower, and weighing but 2½ to 3½ pounds, according to size, it does not add materially to the weight, and is so arranged as to be entirely out of the way. The cut grass can be instantly emptied by pulling the cord shown in Fig. 2, and as the collector is behind the cutter, the cut grass can be left in heaps or a windrow similar to that made by a horse rake, and is easily collected. In Fig. 3 we show the action of cutter, which throws the grass entirely over the cutters back into the canvas collector, so that it does not clog the machine. The plates shown in Fig. 4 are extensible, so as to fit almost any machine, and are all galvanized. This collector is the result of much experiment, and has been used with the most satisfactory results. It is very useful around borders, edges of walks and drives. It is quite inexpensive and thoroughly well made. It is manufactured by C. H. Latham, of Lancaster, Mass.

SOME SUGGESTIONS IN MICROSCOPY.

BY GEO. M. HOPKINS.

An object which always interests the microscopist, and excites the wonder and admiration of those who

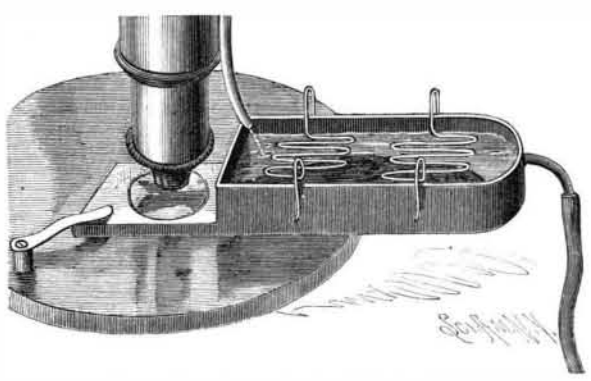


Fig. 1.—FISH TROUGH WITH GRIDS AND CONTINUOUS WATER SUPPLY.

regard things microscopic from the point of popular interest, is the circulating blood in living creatures. Nothing in this line has proved more satisfactory than the microscopic view of the circulation of blood in the tail of a gold fish. Thanks to Mr. Kent's invention of the fish trough, the arrangement of the fish for this purpose has been rendered comparatively simple and easy.

The trough consists of a metallic vessel provided with a thin extension at one end near the bottom furnished with glass-covered apertures above and below. The body of the fish between the gills and tail is wrapped with a strip of soft cloth, and the trough being filled with water, the fish is placed therein, with its tail projecting into the extension between the glass

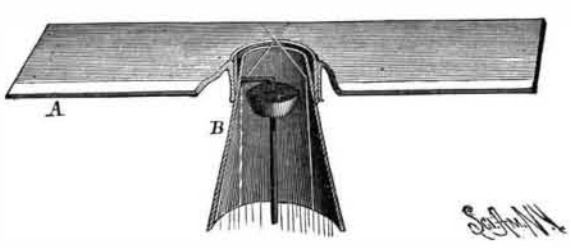


Fig. 2.—DARK GROUND ILLUMINATOR.

covers. The tank is arranged on the microscopic stage with the tail of the fish in position for examination. So long as the fish remains quiescent, all goes well, and the beautiful phenomenon may be witnessed with great satisfaction, but the subject soon becomes impatient, and at the most inopportune moment either withdraws its tail from the field or jumps out of the tank, thus causing a delay which is sometimes embarrassing.

The uneasiness of the fish is caused partly by its unnatural position, and partly by the vitiation of the water. The latter trouble has been remedied by the writer, by inserting a discharge spout in one end of the trough, and providing a tube for continually supplying fresh water. The other difficulty has been surmounted by providing two wire grids (Fig. 1), each having spring clips at their ends for clamping the walls of the tank. These grids are pushed downward near the body and head of the fish, so as to closely confine the little prisoner without doing it the least injury. With these two improvements the examination may be carried on comfortably for an hour or more.

In Fig. 2 is shown a simple device for dark ground illumination. Although it does not take the place of the parabolic illuminator, or the spot lens, for objectives of low angle, it answers an excellent purpose. To a metallic side, A, having a central aperture surrounded by a collar is fitted a funnel, B, of bright tin or nickel plated metal, which is provided with a downwardly projecting, axially arranged wire upon which is placed a wooden button capable of sliding up or down on the wire, the button being of sufficient size to prevent the passage of direct light to the objective. The light by which the illumination is effected passes the button, and striking the walls of the conical reflector, is thrown on the object.

Uranium in the Black Hills.

BY HERMAN REINBOLD.

Among the ores recently found in the Black Hills has been that rare and valuable mineral uranium. Although it has only appeared in one place, situated in the Bald Mountain district, it is found there in such large quantities as to warrant the prospect of early production of uranium salts, as well as the metal uranium, in the United States.

At present uranium mining is carried on only in two places in the world, namely at Annaberg, Saxony, and Redruth, Cornwall, and the scarcity of the mineral has been the cause of its not being used for a very important purpose, the manufacture of steel.

In Europe uranium has only been found in pockets in form of pitchblende, which is uranous and uranic oxide (40 per cent of uranous and 54 per cent of uranic oxide) combined with silica, lead, iron, and manganese; the other uranium ores appearing in such small quantities as not to be commercially valuable. The writer, who has made an examination of the different uranium ores on the Bald Mountain, has found the following minerals in a depth of only a few feet, the rock being of the archæan formation:

1. Uranit (uraniumglimmer) embedded in the rock and the seams, in greenish yellow scales, the vein running vertically and being forty feet wide on the surface. An analysis showed it to be (U_2O_3) 2 PO_4, Cu. As a source for uranium this mineral cannot be used, the costs of concentrating being too high.

2. Pitchblende. This mineral appears in seams, together with the above mentioned scales. From all appearances the rock contains large quantities in greater depths, the conditions being analogous with those at Cornwall. Its composition is U_3O_4, with iron, lead, magnesia, and manganese, also silica.

3. Uraniumochre (U_2O_3) 3 SO_3 and uranochalcit U_3O_4 (Fe, Ca) O SO_3, H_2O, in large bodies of kidney-shaped form; and

4. Trogerit, 3 UO_3, As_2O_5.

All these ores, with the exception of the first one mentioned, may be converted into uranium salts, which are commercially valuable. The chloride, nitrate, and sulphate of uranium are used in the manufacture of stained glass, producing a greenish yellow tint, peculiar to them. They are also used in coloring porcelain (black porcelain), and to some extent in photography. Germany and France are the principal consumers, and lately the output in Europe has decreased, and the price of uranium advanced materially, its cost being now $10 a pound.

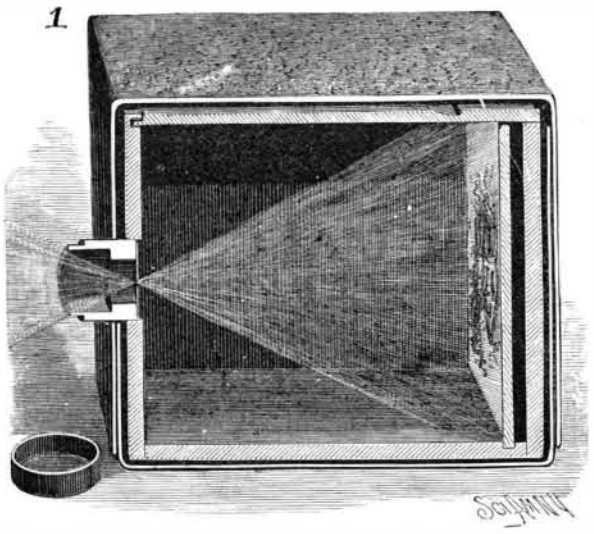
But the uranium find in the Black Hills may be of still greater importance in another direction, as the use of the salt in the manufacture of glass and porcelain is naturally limited.

Experiments and tests which have been made by the great steel and gun manufacturers in England and Germany have shown that the addition of a small percentage of uranium to steel increases its elasticity, and at the same time its hardness, to an extent that makes its use in the manufacture of guns, armor plates, etc., most desirable, but the scaricity of the material and especially the great difficulty in reducing the ore to metal makes the price of uranium steel too high. But since then great improvements have been made in the manufacture of sodium and electricity has been called to the aid of metallurgy; so if large deposits of uranium are found, the metal can be produced for the same price as aluminum. That there are large bodies of uranium in the Black Hills there can be no doubt, and it may be that in no distant time manganese and nickel steel will be superseded by uranium steel.

A ONE DOLLAR PHOTOGRAPHIC OUTFIT.

One would have supposed that the photographic craze had reached its climax when cameras costing from ten to fifty dollars were produced, together with conveniences which would enable almost any one to take photographs, but it appears that a large field has been left unoccupied. A camera has been needed which could produce a good picture with a small outlay.

Such a camera is shown in the annexed engravings. The instrument, together with the entire photographic outfit, including chemicals, is sold for one dollar, and this is the chief novelty of the outfit. This instrument is known as the "Glen Camera," made and sold by Ives, Blakeslee & Williams Company, of 294 Broadway, New York. Inasmuch as all the light used in this camera enters through a pinhole instead of a lens, a rather longer exposure is required than with an ordinary camera, but the results obtained are very good and pictures 2½ inches square are produced.



LONGITUDINAL SECTION OF GLEN CAMERA.

The construction of the camera will be understood by referring to the longitudinal section, Fig. 1. The light coming from the object passes through the pin hole, producing the image on the plate held by a groove in the rear portion of the camera box. As there are no plate holders, the camera must be taken to a dark room for an exchange of plates.

With the camera is furnished the materials and appliances shown in Fig. 2, consisting of six dry plates, a package of blue process paper, one ounce of hyposulphite of soda, a package of developing powder, card

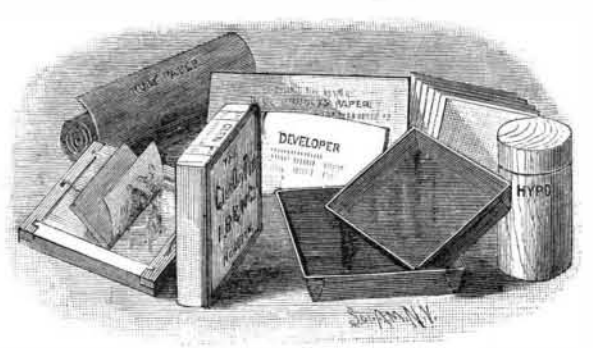


Fig. 2.—MATERIALS AND ACCESSORIES.

mounts, a printing frame, two japanned trays, together with a sheet of ruby paper for making a red light for the dark room. With these the amateur photographer may make, develop, print, and mount his pictures.

The camera is put up for mailing, and the package contains full instructions for making the exposure and all the operations for the completion of the picture.

Wealthy Electricians.

Lucre has smiled on the explorers in the field of electrical science, says the St. Louis *Globe-Democrat*. No scientific body in the country has so many millionaires as the American Institute of Electrical Engineers. At the top of the list is Alexander Graham Bell, whose profits on the telephone are represented by eight figures. Next comes Edison with a seven figure fortune. Brush, of electric light fame, and Elihu Thomson, whose financial future is perhaps brighter than any of the others now, are more than millionaires. Frank J. Sprague was a junior officer in the United States navy six years ago. He is now living in the mansion which was built for the Grants. His company sold out to the Edison Co., for $1,000,000, and half of it went to the inventor. Franklin L. Pope, of New York, and a score of others have independent fortunes. Most of these men were telegraph operators, and most of them began their experimenting and study without a dollar.