

MOVABLE NIGHT LAMP FOR STAIRWAYS.

Many persons, either through habit or by reason of their occupation, enter the house at night after the gas has been put out. Now, there is nothing so disagreeable, and often even so dangerous, as to go up or down stairs in the dark. And yet it is indispensable for the sake of economy, and especially for safety, to shut off the gas at the meter for the night in every house. The movable night lamp, which operates at an expense of but one cent a night, presents the advantage of accompanying those who go up or down stairs after the gas has been put out. The operation of it is simple: It suffices, in order to light one's way in going up stairs, to grasp at the bottom of the staircase a light counterpoise fixed to the lamp by a cord, and the lamp then ascends with the person and affords him light progressively (Fig. 1).

When the story at which one is to stop is reached, the lamp, upon the weight being released, descends of itself to the bottom of the stairway and remains at the disposal of new comers. In order to descend with a light, from no matter what story, it suffices to raise the lamp through the chain that supports it (an operation that requires three seconds) and to grasp the counterpoise. The lamp then follows the person to the bottom of the staircase.

Mr. Armand Murat, the inventor of this apparatus, has here solved a problem which has certainly been studied by numerous investigators, but who, instead of solving the question *in situ*, have devoted their efforts to the creation of various models of small pocket lamps, which, despite their ingenuity, have never answered the practical side expected by the public. Fig. 2 gives the details of the mechanism of the ingenious apparatus. A ring, A, is fixed to the center of the ceiling of the stairway, and supports a pulley, C. Two cables, kept parallel, run from the top to the bottom, and are fixed to the point, B, and are rendered taut by stretchers, B'. The pulley, C, has a corresponding one, C', below. A chain, D, passes in the groove of these two pulleys, and carries a counterpoise, P. The cheeks of the bottom pulley support a weight, P, through a rod that passes freely through the bar, R, fixed to the wall or staircase. This weight, P, thus draws upon the chain and keeps it always equally taut. A plate, H, is traversed by two tubes, K, to which it is soldered. These two tubes are connected by a straight bar at S and S'. The chain and its counterpoise, F, traverse the plate at V. The cables pass into the two tubes, K, and serve as a guide to the lamp that is screwed to the center of the plate. The two extremities of the chain are attached to the center of the bars, S and S'. The plate, terminating in the form of a reversed T, supports upon this T a roller formed of two perforated balls connected with each other by an open ring, L, forming the two axles of the balls. This roller is thus capable of revolving around the plate without touching either the chain or the tubes.

To the ring, L, is attached a cord that terminates in a tassel, M, that conceals a weight. A regulator placed in the shell of the upper pulley regulates the motion of the apparatus during the descent.

The apparatus operates as follows: The counterpoise, F, is heavier than the lamp, L, and its support, but not so heavy as they are when the weight, M, is added to them. The result is that, if a person ascends the stairs in holding the weight, M, in his hand, the counterpoise, F, descends, and the lamp precedes and affords him a light.

Upon reaching the story at which one wishes to stop, the counterpoise, F, upon the weight, M, being freed, rises and the lamp descends alone to the bottom. In order to bring the lamp from any story whatever, to utilize

it, it suffices to pull the chain upon the side, F, until the weight, M, rises within reach of the hand, which it will do in about four seconds from the sixth story.—*La Nature*.

THE NEW DUDLEY OBSERVATORY, IN ALBANY.

The Dudley Observatory, of Albany, N. Y., opened in 1856, has always held a high rank. It was named in memory of Hon. Charles E. Dudley, the original gifts from Mr. Dudley's widow amounting to \$105,000; to which was added over \$80,000 from private donations

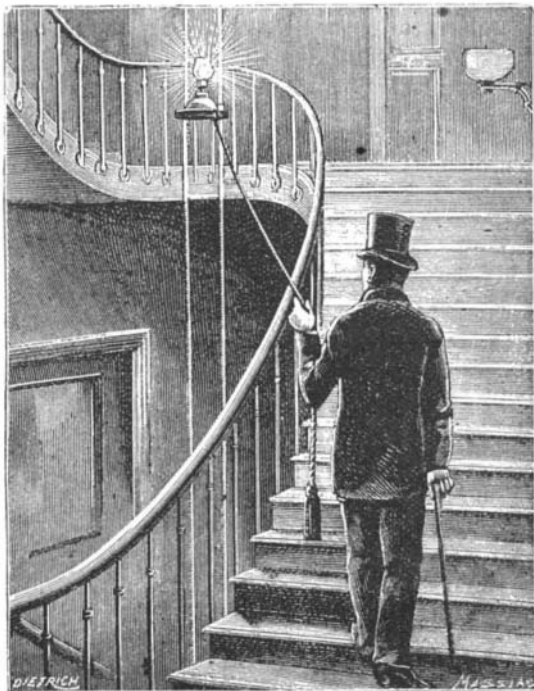


Fig. 1.

Fig. 1.—MOVABLE LAMP FOR STAIRWAY.

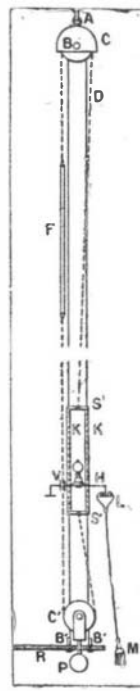


Fig. 2.

Fig. 2.—EXPLANATORY DIAGRAM.

in New York City and Albany. The staff of the institution has included some of the best known astronomers and scientists in the country, among them Dr. Benjamin A. Gould, Dr. C. H. F. Peters, Dr. Francis A. Brunnow, Professor O. M. Mitchell, and Professor George W. Hough. The present director of the observatory, Professor Lewis Boss, appointed in 1876, is a graduate of Dartmouth College.

The original location of Dudley Observatory has proved unfortunate, because it was close to the tracks of one of the largest railroads in the country. New buildings on a new site became, therefore, a necessity, if the institution were to continue to perform valuable work, and for this object Miss Catharine Wolfe Bruce gave \$25,000, afterward increasing the amount by \$10,000. Private subscriptions of over \$20,000 were

added; and the city of Albany gave a lot and \$15,000 in exchange for the old property. The endowment fund stood at \$84,000 before these gifts. It has been almost doubled. But the efficiency of the observatory has been more than doubled by the new buildings and by a new telescope with a lens of $12\frac{1}{10}$ inches in diameter.

The site of the new buildings, about one mile from the capitol, is excellently adapted to the purpose. The instruments will all be at least 300 feet from the nearest road, and more than a mile from the nearest railroad. The horizon is unobstructed in all directions and there is no danger of future damaging encroachments by buildings. The new buildings consist of the main observatory structure, 70 by 35 feet, with a fireproof tower on the south west corner, which supports a revolving dome 21 feet in diameter, under which the new telescope is to be placed on a pier resting upon a deep foundation and throughout its length isolated from contact with the building or its floors. The lower floor contains a library and lecture room 30 by 20 feet, also two computing rooms, a clock room, and other small rooms. The second floor serves for laboratories and a dormitory for assistant observers. Connected with the main building by a corridor 20 feet long is the dwelling for the astronomer, which is 34 by 50 feet.

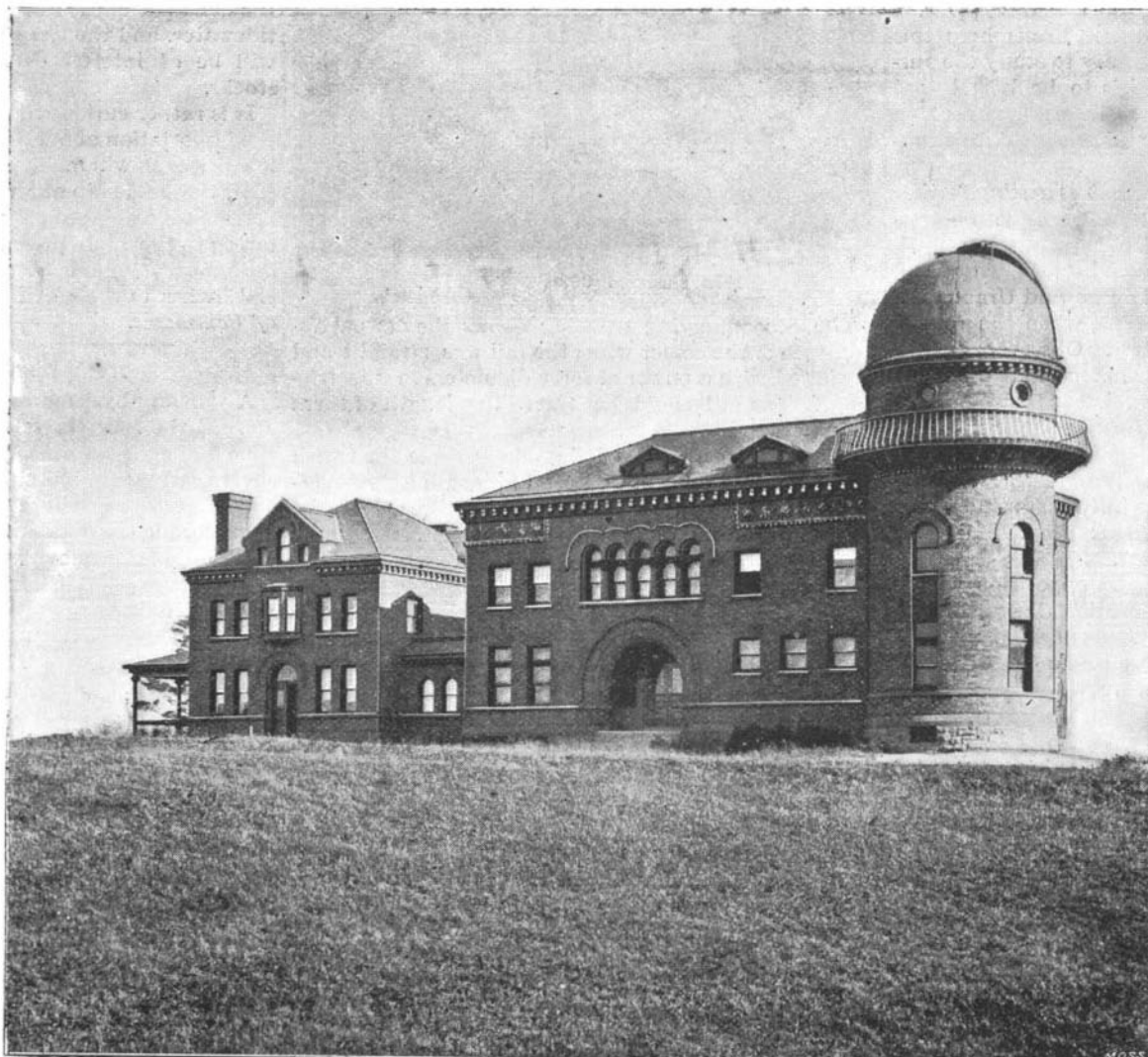
The new telescope which is added to the five instruments which were in the old building is the Pruyn equatorial, the gift of Robert C. and Charles L. Pruyn. The telescope, although not comparable in size with some of the giant telescopes of modern times, is large enough for the use of the practical astronomer in the great majority of cases in which he requires an instrument of precision. The size is better adapted to exact measurements than is that of larger telescopes. The objective glasses of the telescope, slightly more than 12 inches in diameter, were polished by Branhear, of Allegheny, Pa. The length of this telescope is 15 feet when arranged for the customary use, but

within less than twenty minutes at any time this telescope, by exchange of objective glasses and by other adaptations, can be converted into a powerful telescope for celestial photography, as perfect in all respects as if the instrument had been designed for that purpose alone. Attached to the main tube is a third telescope 12 feet in length, which has various uses, and is the guide telescope in photographic work. The "finder" is a fine three-inch telescope.

The buildings are solidly and plainly constructed after designs furnished by architects Fuller & Wheeler, of Albany. The entire cost of the two buildings complete is somewhat less than \$30,000. In the rear of the buildings, and at a distance of about 100 feet from them, is a small structure with iron framework covered with galvanized iron. Outside of this is a covering of louver work, affording a free circulation of air between the outer and inner coverings. This building contains the meridian circle, the chief instrument to be used at present in the work of the observatory. The roof is built in sections, each section arranged to roll back upon rails when desired, in a manner such as to leave an opening six feet wide from north to south through the center of the building. Through this opening the observations are to be made. In connection with the meridian circle is provided a tubeless horizontal telescope 300 feet long, the glass objective and the focal mark being supported on massive piers covered with small iron sheds to protect them from the elements.

The reopening of the Dudley Observatory took place on the 8th of November. The National Academy of Sciences met in Albany on that occasion and the address was delivered by Professor Simon Newcomb, superintendent of the Nautical Almanac office in Washington.

THE expansion of water in congelation is such that eleven feet of water make twelve feet of ice,



THE NEW DUDLEY OBSERVATORY, ALBANY, N. Y.