to form a fulminate of silver if kept, and this is very dangerous and liable to cause an explosion. When the mirror is dry make a soft small pad of leather filled with cotton. The inside of a lady's old suede glove is best. Now go gently over the silver film with this and a dust of rouge. The film will quickly take a beautiful black polish and your mirror will be done.

To suspend the mirror in the dish a strip of wood must be fastened to the back and the arrangement made as in Fig. 16.

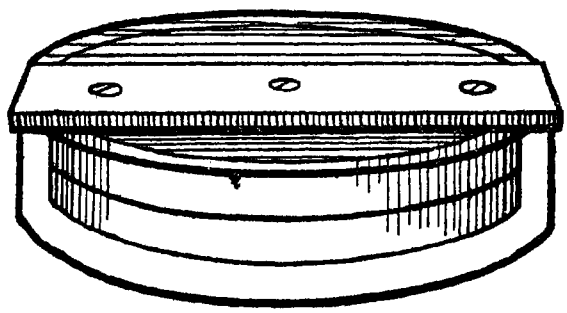

Fig. 16.

The strip can be fastened to the wooden back by three small screws and the whole can afterwards be removed from the mirror by a sharp knock on the wood with a mallet. This will crack the pitch and the supports will come clear away from the glass.

In my next and last paper I will describe how to mount the mirror for use.

A Note on the Discovery of the Martian Canals.

BY

MR. D. N. DUTT.

IN the collection of Professor Lowell's lectures on Mars first published in book form in 1908, the chapter on the Canals and Oases of Mars opens with the following remarks :—

" Thirty years ago what were taken for the continents of Mars seemed, as one would expect continents seen at such a distance to appear, virtually featureless.

In 1877, however, a remarkable observer made a still more remarkable discovery; for in that year Schiaparelli, in scanning these continents, chanced upon long, narrow markings in them which have since become famous as the Canals of Mars."

No mention is made here of the fact that long before Schiaparelli a few of the more conspicuous of these canals had been observed by an English astronomer—the Rev. Dawes. In the Monthly Notices of the Royal Astronomical Society for June 1865 we come across the following note by this astronomer:—

"Several curious and interesting features were brought out during the last opposition, which I had never before seen so distinctly. Of these one of the most remarkable was the long narrow strait running N.-E. and S.-W. in the northern hemisphere and depicted distinctly in sketches made on November 10th (9h.), 12th and 14th (12h.); and more faintly on November 10th (12h. 6m.), January 20th, 21st and 22nd. This I saw and depicted at the opposition in 1852 at which time the North Pole was visible, but though the planet was then in an excellent position for observation (having a north declination of about 24°), I did not make it out so distinctly with my 6⅓-inch Munich object-glass as with my present 8-inch."

Of the sketches mentioned in the above note those of November 12th and November 14th published by the Royal Astronomical Society in 1866 are very distinct and their definiteness and close resemblance with each other, though taken at different positions, arrest attention and testify to the power of observation of the English astronomer. Since his days our knowledge of Mars has considerably increased; we have now detailed records of the variations in its physical surface; and one might expect that the observations of a period so old as 1864 would prove materially defective; but the great point in Mr. Dawes' pictures is that in their broad features they stand uncorrected to the present day. A very good comparison of these drawings may be made with the chart of Mars on Marcator's Projection printed in the Memoirs of the British Astronomical Association, Vol. XVII, Part III. With the help of this chart most of the lines in Mr. Dawes' drawings can be easily identified. The comparison would also show that some of the lines shown therein do not go far enough. This was an imperfection that might have been expected—in the beginning every great discovery is imperfect—but the important thing to remember

is that the credit for the discovery of the Martian Canals does not belong entirely to Schiaparelli as the study of Professor Lowell's lectures referred to above would lead one to believe, but that an earlier astronomer has some share in the credit. This is a fact which is apt to be forgotten, and it is the object of this note to bring it to notice. It is gratifying that in Sir Robert Ball's "Story of the Heavens" the name of Dawes is mentioned as one of the earliest observers of Canals in Mars.

Extracts from Publications.

Gain of Definition Obtained by Moving a Telescope.—Professor E. E. Barnard writes in *Nature* apropos of certain previous correspondence on the subject published in that journal: "Many years ago, when I used to sweep for comets, sometimes nebulæ would be seen to enter the field which were so faint that when the telescope came to rest they were only just discernible or invisible altogether. By slowly swinging the telescope back and forth they would become readily visible, as if the process of motion had the effect of greatly multiplying their light. This was not an unusual occurrence. I remember also that it made quite a difference as to whether the object entered from the right or the left side of the field. It was easier to detect a very faint nebula or comet when it entered from a certain side. I cannot now remember whether this was from the right or left (the sweep being horizontal), but I know I used to take advantage of the fact and sweep so that the stars should enter from the favourable direction."

[*Nature*.

Gyrostats and Gyrostatic Action.—The top as a plaything is despised; nevertheless it is a most important contrivance. The earth on which we live is a top, and a considerable range of astronomical phenomena are most easily explained by reference to the behaviour of ordinary spinning tops. * * * * * *

The properties of a top are best studied in the gyroscope, or gyrostat, as it is better called. This instrument in its simplest form consists of a heavy-rimmed metal disc or fly-wheel capable of rotation with but little friction on pivots held in sockets attached to a metal frame. Thus the