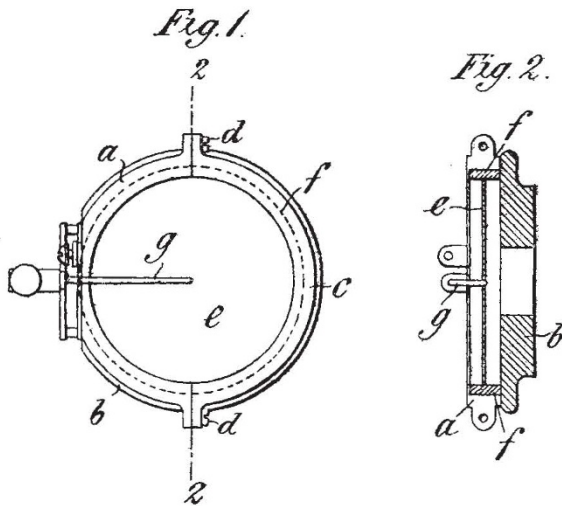


### Gramophone Experiments.

For some time I have been experimenting with the gramophone sound-box, and I came to the conclusion that with a diaphragm nipped firmly between two rubber rings there was a tendency for a vibration from the stylus bar to be cannoned back from the edge so held, and that one did not get a true ring. I made a sound-box as shown below (Figs. 1 and 2) in



FIGS. 1 and 2.—*a* is half a split ring connected to the sound box *b*; *c* is the other half of the split ring connected to *a* by screws *d d*; the diaphragm *e* is held in position by an elastic ring *f*, which is secured to sound box by means of the two halves *a* and *c*; *g* is the stylus bar. The sound box is protected by patent.

which the diaphragm is only held on its edge, and by cutting the front of the box in half it enabled me to mount the diaphragm free from distortion. With this box there is a very marked difference.

In a band record one can differentiate each instrument more readily.

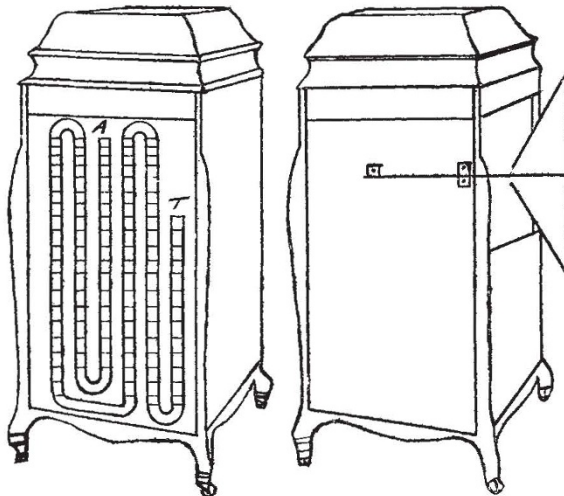


FIG. 3.—*A* connected with tapered arm: *T* with horn. FIG. 4.—Showing position of conical reflector.

Working on Prof. McKendrick's experiments, as described in NATURE of April 20, 1911, I found that with an enclosed horn machine, as shown in Figs. 3 and 4, by passing the sound waves through about 17 ft. of 2-in. flexible metallic voice tube (the tubes all being inside the cabinet out of sight), all the

noises which he eliminates by the use of peas are done away with, and the sound much increased by not using peas. In addition to this, to augment the sound I place a 2 ft. by 8 in. deep conical reflector with the apex of the cone cut off, leaving a 4-in. opening pointing to horn, as shown in Fig. 4. The result is that a musical effect is produced free from overtones and harsh sounds.

ERNEST DE LA RUE.

WITH reference to the above interesting communication by Mr. Ernest de la Rue, I have to say that the method he has adopted for fixing the diaphragm of the sound-box is a marked improvement. Mr. de la Rue has kindly sent me a specimen of the sound-box, and it has given me great satisfaction, both as to quality and volume of tone. I have not had the opportunity of hearing the arrangement he has devised for removing friction noises, but no doubt it will be satisfactory. I am quite pleased with my own method, which gives excellent results, and it is adapted to the older form of gramophone which I use. The tones are sufficiently loud for a room of ordinary dimensions, and the quality, with Mr. de la Rue's sound-box, is excellent. A witty friend of mine has called my plan the pipe of peace (peas)!

J. G. MCKENDRICK.

### Reported Occurrence of the Dartford Warbler at the Tuskar Light Station.

I HAVE recently returned after nine weeks' residence at the Tuskar Light Station, off the south-east coast of county Wexford, where I have been prosecuting the study of bird-migration. I obtained several interesting records, including those of some rare species. To these may be added a highly interesting and at the same time important record of the occurrence of a Dartford warbler. Owing to the sedentary habits of this species its appearance at the Tuskar Rock was quite unexpected, and heretofore the bird was unknown in Ireland.

This warbler was obtained on October 27, as I am informed by the principal lightkeeper, to whom I owe my cordial thanks for the kind aid he has so often and cheerfully given me in connection with my work on bird-migration.

C. J. PATTEN.

The University, Sheffield, November 10.

### THE CRYSTAL SPACE-LATTICE REVEALED BY RÖNTGEN RAYS.

DURING a visit to Munich at the beginning of August last the writer was deeply interested in some extraordinary photographs which were shown to him by Prof. von Groth, the *doyen* of the crystallographic world, and professor of mineralogy at the university of that city. They had been obtained by Dr. M. Laue, assisted in the experiments by Herren W. Friedrich and P. Knipping, in the laboratory of Prof. A. Sommerfeld in Munich, by passing a narrow cylindrical beam of Röntgen rays through a crystal of zinc blende, the cubic form of naturally occurring sulphide of zinc, and receiving the transmitted rays upon a photographic plate. They consisted of black spots arranged in a geometrical pattern, in which a square predominated, exactly in accordance with the holohedral cubic symmetry of the space-lattice attributed by crystallographers to zinc blende.

Prof. von Groth expressed the opinion, in agreement with Herr Laue, that owing to the exceed-