East Oakland, where the shock was heavier, it moved about 5-16 of an inch. An earthquake in which the motion was a half-inch would prove very disastrous, and yet people do not hesitate to say that they saw the earth move at least a foot. This earthquake was by far the heaviest ever recorded at the Chabot Observatory. It was at least 50 per cent heavier than that of May 19th, and that had been the heaviest up to that time."

Prof. E. S. Holden, director of the Lick Observatory, says: "Mr. Keeler, in charge of the earthquake instrument, has just measured the intensity of the shock of this morning. It recorded that the shock occurred here at 4h. 46m. and 45s., and lasted for 30 seconds. The extreme motion was from north to south. It was equal to 2-100 of an inch, and the east and west motion was about the same. The vertical motion was very small. The period of the wave was about 3·10 of a second, and its intensity is estimated at five."

At the students' observatory at Berkeley the shock was registered as occuring at 4.47 o'clock in the morning and lasting 15 seconds. The vibration was from north of west to south of east. It was followed by three slight ones at short intervals. Prof. Frank Soule says that this was the most severe earthquake that he has experienced since he came to California in 1869. He classes it as sixth in the Rossi-Forel scale—that is, one that throws down chimneys and small articles.

SEISMOGRAPH TRACING.

Prof. Davidson expresses the opinion that the quake is in no way connected with the Japanese catastrophe, but is of local origin, very probably linked with the phenomena of subterranean activity at Susanville.

Mr. F. G. Blinn, of Highland Park, East Oakland, has given us a tracing from his seismograph, which is reproduced herewith. The figure magnifies the motion four and eight-tenths times. According to his instrument, the actual motion of the earth was ·58 of an inch—a little over half an inch. The centre of the shock appears to have been near that locality; it was more severe in Fruitvale, to the eastward, where some chimneys were thrown down and glass broken. The shock was felt some seven seconds later in San Francisco than in East Oakland, and appears to have been lighter outside of the latter point.

Mr. Adley H. Cummins, a scientist, who has lectured several times before the California Academy of Sciences, was so startled by the earthquake shock that he died. Mr. Cummins had been suffering from heart disease.—*Mining and Scientific Press.*

RADIATOR OF NEW DESIGN.

The accompanying engravings represent a radiator adapted for warming buildings by means of either hot water or steam. The exterior appearance, Fig. 1, shows a marked departure in general design that commends itself for its unique and novel character; Fig. 2 shows the interior construction, how circulation is conducted, and the way of connecting the tiers of sections. To this sectional view special attention is called, as it illustrates very clearly the general arrangement of the different parts. It will be seen that the water circulates through radiators of this construction horizontally, going first to the top section, and thence right and left to the bottom one, where it reaches the return pipe. It is claimed that this circulation has less interruption and less friction to overcome than any other. When the pipes or conduits in a radiator are set perpendicularly, the circulation (which is caused by gravity, or the tendency of the colder and therefore denser and heavier water to flow downward), must be interfered with when its course lies upward, as it does in a portion of the pipes or sections of such a radiator. Besides, as air rises to the highest point in a radiator, each section, when set perpendicularly, affords opportunity for the collection and confinement of air, to the great detriment of the circulation, and would require an air valve for each section, besides the trouble of letting the air out of all of them. In this radiator a single air valve in the top section suffices.

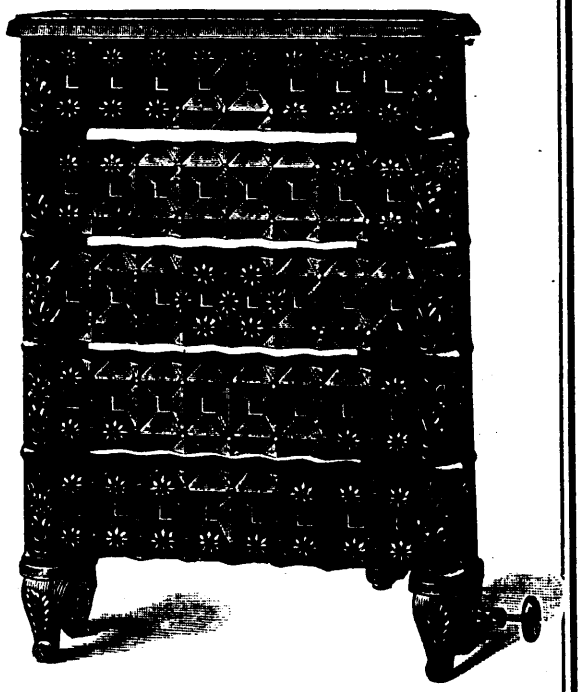

FIG. 1.