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Lyre and Tuning Fork
Musical Theme Sundial

R. L. S. 09 JAN 89

An early description of the Sunquest sundial states that the design of sundials is a " - - fascinating and well-defined mixture of mathematics, geometry, geography and astronomy - - - - that the designer permits the primary time-telling function to control its form - - - - and that pleasing though strange and unexpected shapes often emerge from the equations which describe the ever-changing slant of the sun's rays."

Although sundials, like clock faces, can be made out of, or applied to, many familiar shapes, in the selection of settings and choice of features for larger memorial-type sundials, and in working out the design parameters, it became apparent that several elements in one of the designs resembled, in a way, the musical instruments - lyre and tuning fork.

Thus, keeping in harmony the visual esthetics with the specifications for accurate clock-time time-keeping and the durability against vandalism, climate and weather, maintenance, and the hand-attraction or appeal for all persons in the sunshine of a university community, and the construction problems for the size envisioned, a workable design concept came about as shown on the Dwg., dated 09 JAN 89, "Lyre and Tuning Fork Musical Theme Sundial".

The ring portion of the time-scale element of this sundial design is derived from the principal ring of the traditional armillary, but opened at the top, as in the Sunquest and other modern designs, to allow the sunshine to reach the time scale without interfering shadows from other parts. This occurs at mid-day and during the equinox periods of alignment by the sun with the equator of the earth, and by the sun with the equator of the sundial. Extensions at each end of the open crescent top are all that was necessary to make the ideal shape for sundial operation become, in the eye of the beholder, the familiar shape of the lyre.

The entire shadow-receiving time-scale member is guided by, and movable in, a rotating or sliding

fashion within the fixed structure of the sundial to allow adjustment for the exact longitude of the sundial location, for Daylight/Standard Time change twice per year, and for the Equation-of-Time variation of the early or late sun with the constant or mean clock-time used by everyone.

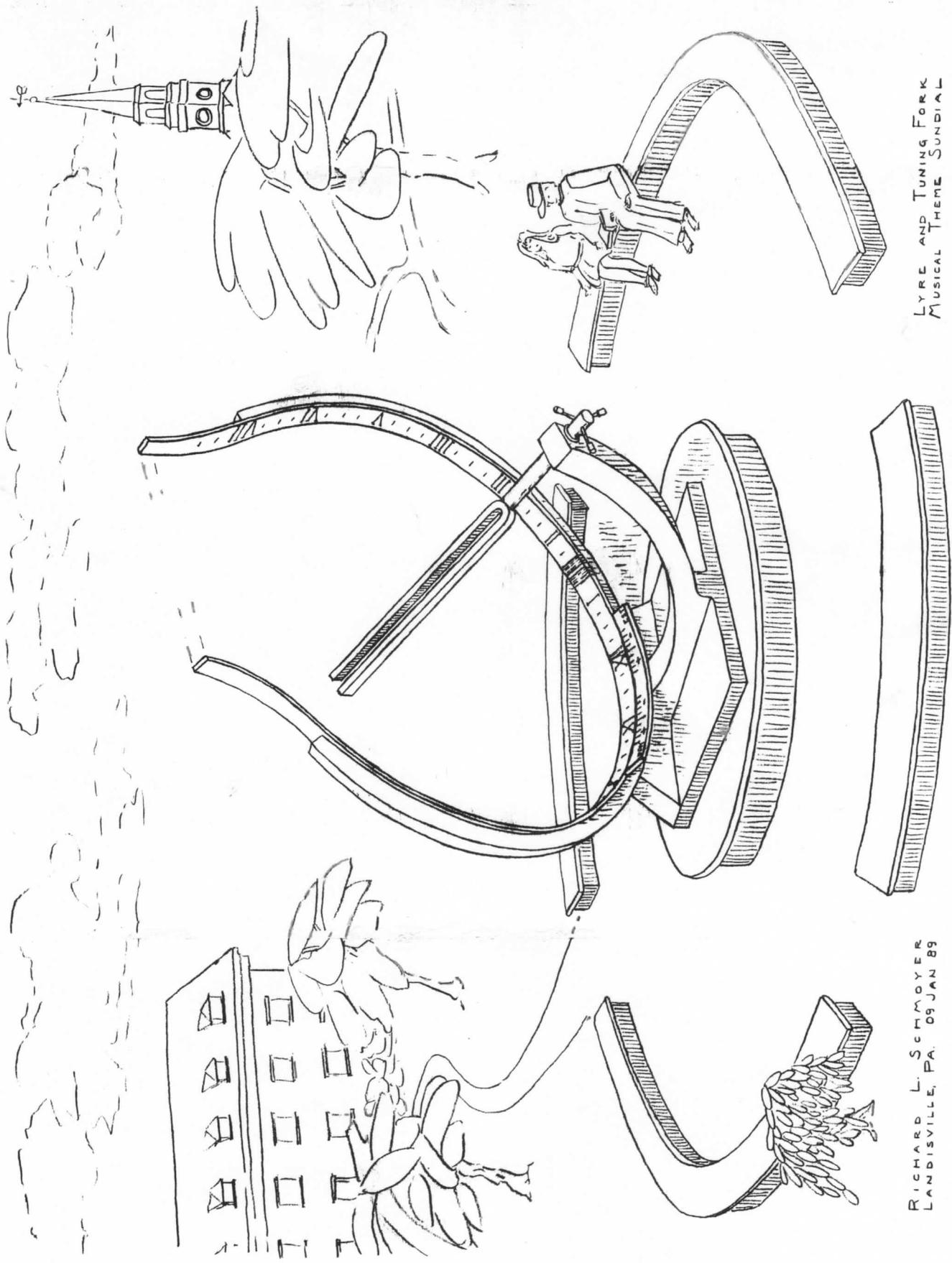
The adjustment mechanism, not visible on the drawing, and unlike the scheme for the same adjustment feature in the Sunquest sundial, is proposed to be not a thing for viewers to use or play with. Instead a wrench/key socket at an inconspicuous place, perhaps in the base structure, and available only to a custodian or groundsman will move the time-scale + or - every few days to bring the time-telling shadow in its progression into beat with the mean-time clock. The total movement throughout the year is equivalent to less than ± 16 minutes.

The tuning fork, or gnomon, or shadow producing member, parallel with the axis of the earth, and thus pointing to the true north (near the North Star) center of the earth's rotation, has several features which would not be workable except in a larger sundial, as in this proposal. The shadow made by this gnomon shows the time on the time-scale as the sun moves across the sky. Defined by its edges, strong or not so strong as the atmosphere allows, the shadow has a width equal to the width of the gnomon, but the exact time it shows would be in the exact center of the shadow, not at the shadow edge. Being slotted, as is a tuning fork, provides a way to show the shadow center.

The gnomon is fitted to turn freely in a husky bearing-like pivot and has handles inviting children and grown-ups both to enjoy aligning the slot with the direction of the sun at any time of the day, and producing on the time-scale a narrow band of light between two shadows, more visible, more exactly in line to read the sub-divisions for accurate or close time telling. Moreover, a bit extra or reverse turning of the gnomon fine-tunes the actual width of the band of light and thus fine-tunes the accuracy of the reading.

The sundial can be looked at, used to tell time with a casual glance as you walk past, or to set your watch with an interesting moment of close observation. All the factors of the earth-sun mean-time relationships, geographic location, and Daylight time have been considered in this design (except the Feb. 29th leap year error - of about 20 sec. maximum every four years) making the accuracy a function, therefore, of size, workmanship, fit of parts, divisions (1, 2, or 5 minutes, etc.) selected for the time-scale, and user wishes - about 1 minute. The design-concept drawing (RLS 09 JAN 89), of course, needs engineering construction drawings for fabrication in aluminum or iron, or other, and depending upon size selected as a memorial with a suggested range from about 4 ft. inside dia. of time scale to 12 ft. dia. (about 14 ft. high).

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