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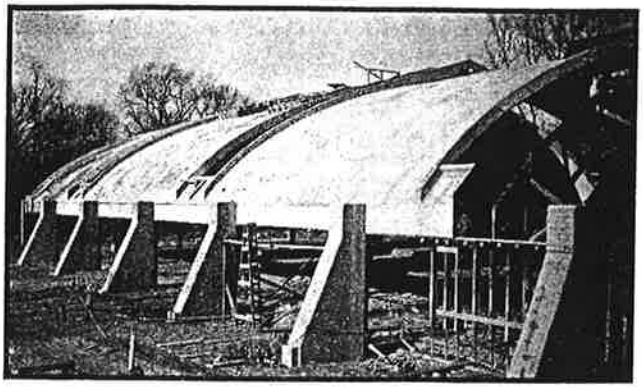
Modern Rink Embodies Latest Ideas in Construction

Figure Skating has Become Popular International Sport



Courtesy of Warner Company, Philadelphia

IF the spirit of international trade should seek a recreational outlet, expressing in sport the qualities which foster sound international business ideas, it might find the answer in skating contests. The exercise is common to many racial groups. Its scope has been limited only by climate conditions. The Scandinavian countries, the Netherlands and Canada have been blessed with expert performers.

Now the skating frontier is extending southward. Artificial methods of freezing water and the creation of indoor rinks are making the pastime accessible to communities where it had long been denied. Easily conceivable is a prospect that the constantly widening field of activity may some day reach the tropics.

Skill on skates means more than speed. It emphasizes grace and rhythm. It combines the appeal of dancing with the sweeping thrill of curves of magnificent radius. It captivates the artist; for it is alive with color also. The performers wear radiant costumes. Glamorous and esthetic apparel adds vitality to the picture.

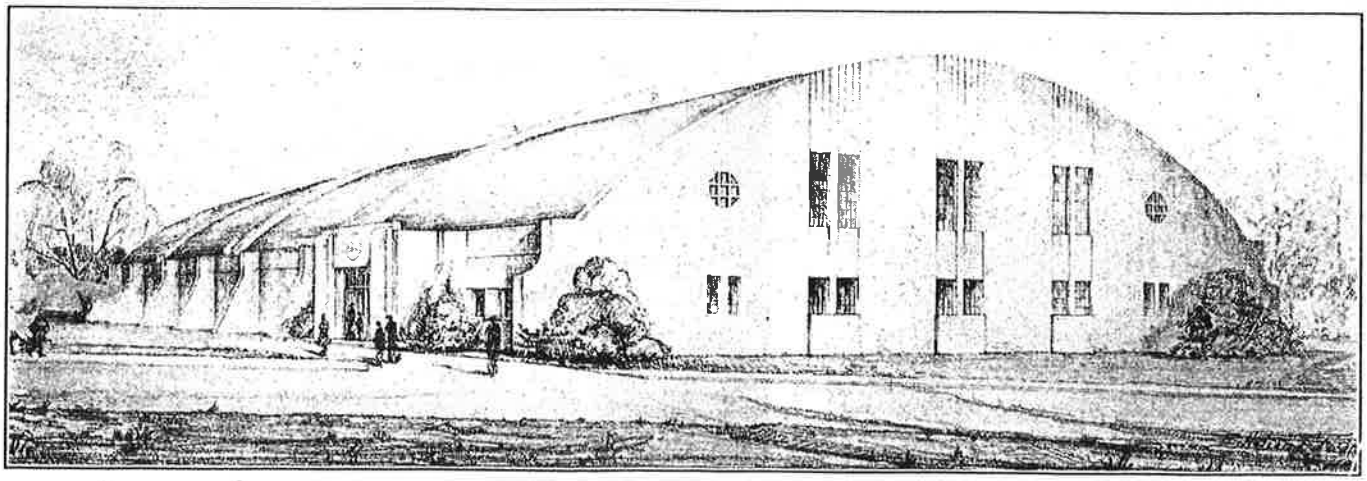
Doubtless the observation may be safely ventured that skating is outstandingly the international competitive sport. Persons concerned with the implications of foreign trade who accept these views may find worthy of their attention the new indoor rink at Ardmore, near Philadelphia, Pa., where the amateur contests for the national championships of 1938 in figure skating were held February 25 and 26 under the auspices of the United States Figure Skating Association which cooperates with the international body.

The building itself, which was erected by the Philadelphia Skating Club and Humane Society, presents new ideas for economical maintenance and durable safety. It measures 105 feet, six inches, along the street front and extends back 235 feet. Side walls, 13 feet, eight inches, high, are surmounted by a semi-cylindrical roof rising to a crest 35 feet above the ice surface. The skating area is 85 by 185. This leaves at the front of the building a space 50 feet wide for club lounge and locker rooms with accommodations for 650 members including pupils in the children's classes. The floor surrounding the rectangular rink is available for spectators on four sides. Over the club rooms at the south end, a second floor, or balcony, provides club quarters and room for more spectators. Later the capacity of the club house may be increased by an external addition on the east side.

A small basement, about ten by 100 feet, contains the boiler room, transformer room and freezing equipment. An oil burner supplies heat for the locker and club rooms.

The architect is E. Nelson Edwards of Philadelphia, a member of the Skating Committee of the Philadelphia Club. The engineers are Roberts & Schaefer Co., of Chicago and the local contractors are Sauter & Schwertner of Philadelphia.

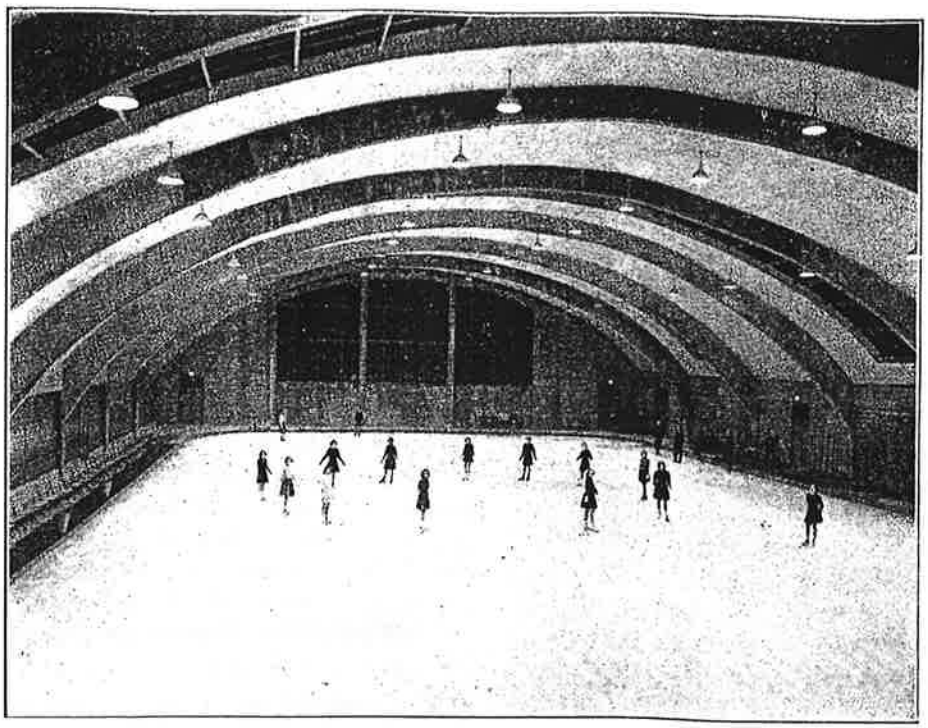
Of the architectural features the Barrel Shell roof commands attention. It exemplifies the Zeiss-Dywi-



dag monolithic, reinforced concrete design patented by Dyckerhoff & Widmann, A. G., of Berlin, Germany, whose American rights are exercised by the Roberts & Schaefer company of Chicago. Known popularly as "Z-D," this system was derived from Shell Domes and the name in part pays tribute to the planetarium fame of the Zeiss firm of Jena who were the original inventors. The Barrell Shell, instead of being a dome or hemisphere, is a semi-cylinder. Longitudinally it may have any length.

Significant is the span of the shell. Its contour follows nearly the path of a semi-ellipse. But the theoretical equation of the curve is a mathematical concept less impressive than its material aspects. For a relatively small amount of concrete, with a consequent lessening of the dead load, fulfills its functional purpose without the use of truss girders to carry the roof. In this building the concrete shell is only 2⅝ inches thick at the top. It increases to 4½ inches at the edges. The amazing fact here is that a membrane, too thin to conceal a baseball, if one were imbedded within it, spans a width in excess of 105 feet. In other words, a ratio of nearly 1 to 482. The margin of safety, however, is a comfortable one; because the efficiency of these vaults will support a ratio of thickness to span equivalent to 1 to 600

By arranging the center line of the shell plate in a definite relation to the thrust line, and by making the end-tangents of the curved plate vertical, the shell does not bend and the thrust at the crown diminishes to zero at the springing line. It has been transferred by tangential shear to the stiffening arches. The shell is not supported in the springing line.



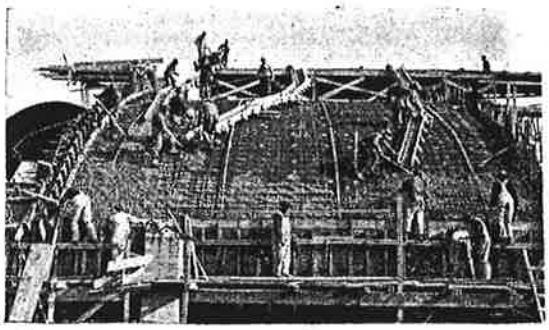
Skating on the Indoor Rink at Ardmore, Pa.

The thrust concentrated in the stiffening arches is taken up by tie beams under the ice floor.

The principle has been explained by illustrations from nature. For example, if a person splits an English walnut (Juglans regia) in halves, he will notice that the shell is thicker at the seams than at points of convexity. Similarly, say engineers, the structure of an unbroken egg renders difficult any ordinary attempt to crush the shell by pressure on its longitudinal axis. For this reason the "Z-D" Barrel Shell roofs have obtained a remarkable vogue for covered arenas, hangars, warehouses and other structures in America and Europe where a broad expanse is required without the interruption of too frequent pillars.

The roof at the Ardmore rink consists of eight bays separated by concrete arch ribs on the under side of the shell roof, 29 feet, 2 inches, on centres. Stresses are transferred to these arch ribs in a manner to eliminate any arch action in the shell itself. Between every other arch rib the roof is cut completely through, forming expansion joints. At three of these over the ice arena, the joint or cut has been widened to nine feet, eight inches, and the space filled with corrugated wire glass skylights of actinic glass. The roof was poured in five separate pourings. Due to the equal spacing of the arch the same forms were used for each unit pouring. After tests to determine the strength of the concrete, the forms were lowered from the under side of the roof by means of jacks and the entire scaffoling was moved on runways to the adjoining section.

The west wall is made of Owens-Illinois Insulux glass blocks. Here the afternoon sun has free play; outside no other structures are immediately adjacent. At this part of



View at left shows roof of rink under construction. View at right shows interior with west wall of glass blocks. Pictures by courtesy of Warner Company, Philadelphia, which supplied the crushed stone and Manor sand

the day, when the rink is most commonly used, the arena receives a maximum of natural light and thereby effects a saving in the cost of artificial illumination. This is due to the fact that the "daylighted walls" of Insulux glass blocks usher in floods of natural light but perfectly diffused. The patterns on the face of the blocks break up direct sun rays so the heat or "sun spots" on the ice and sun glare are eliminated.

Insulux glass blocks are hollow, water-clear units containing dry, rarefied air at a partial vacuum, which give the blocks their exceptional insulation value. Thus, the light-diffusing patterns on the blocks make it impossible for the sun to concentrate its rays upon the ice, and the vacuum characteristic reduces heat flow, which further assists in temperature and humidity control both in summer and winter, a particularly important factor in maintaining maximum comfort for patrons and proper condition of the ice for either figure or speed skaters.

The latter prefer harder ice than do figure skaters. Figure skaters like the top surface of the ice slightly softer. To accomplish this, control of air temperature and humidity is essential.

The freezing of the ice is accomplished without the use of brine by what is known as the direct expansion system installed by the York Ice Machinery Corporation. A total of six miles of pipe were laid on cedar sleepers resting, in turn, on a twelve-inch cinder fill. The pipe is welded at all joints and is evenly spaced over the entire floor area on approximately 4½ inch centres. The space between the pipes is filled with sand.

Liquid ammonia is pumped directly through a series of coils about 1000 feet in length, when it returns to a header. The ammonia is kept at such pressure that it boils as it passes through the pipes, absorbing heat from the water and thus producing ice over the floor of the rink. As the ammonia boils and turns to a gas, it is returned to condensers, cooled by water from a nearby stream, and converted again to a liquid state. Two 50 h.p., compressers maintain the ammonia pressure at the desired point. There is a continuous cycle of operations which depend on the natural laws governing the boiling point of ammonia in relation to atmospheric pressures. Because the entire system has welded joints, there is no danger of ammonia leakage.

The Philadelphia Skating Club is the oldest in the United States and was the first private club to commence construction of its own private Rink. Subsequently the Cleveland Figure Skating Club began the building of its rink. Both clubs owe a tremendous debt of gratitude to the Toronto Skating Club of Canada for its inspiration and assistance. It has had its own Rink for many years. The club was organized December 28, 1849, and was incorporated February 28, 1861, by the Pennsylvania Legislature. Its lineage prior to these dates traces back to 1790 when the Philadelphia Humane Society was organized on the pattern of the Royal Humane Society of London. The Humane society's purpose was to rescue persons when a sudden emergency endangered their lives. In those days communities were not so well equipped with a police force adequate for rendering aid, as is the case now. The society had an endowment fund and awarded medals to individuals who performed heroic acts. Skating accidents were a fruitful source of Humane activity. Members of the Skating club joined frequently in these duties. In fact, the by-laws required them to wear a badge on the ice and carry a reel of cord looped around the wrist. One end of the cord was thrown to any victim who broke through the ice. Members still wear the badge, a small silver skate emblem.

When the club was incorporated in 1861, it took over the name and medal of the Humane society. One of its early evidences of international good will was its conferring of the insignia on Napoleon III, emperor of the French, who received a badge, cord and reel, with a pair of improved steel skates made by a club member, in a handsome walnut case. Soon after incorporation the club erected a house on the east bank of the Schuylkill, the beginning of "boat-house row" in Fairmount Park, which it still occupies. In 1922 the club organized a figure skating class in the international style, originated by Jackson Haines, an American.

Since then the principal skating activity has been indoors. The members helped organize the United States Figure Skating association, which controls amateur figure skating in the United States. The president of the Philadelphia club is a director of the national association, Edgar S. McKaig, Philadelphia lawyer who is also president of the trustees of the Commercial Museum. In 1936 Mr. McKaig was a time keeper for some of the Olympic skating events at Garmisch-Partenkirschen, Germany.

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Ice Breakers - Building Adult's Skills

Marianna Thomas has done a superb job of organizing and conducting Ice Breaker sessions for adult skaters during the past year. Returning "hard core" Ice Breakers have been augmented by new participants as well as new club members. Michelle Marvin and Stuart Bradley provided excellent instruction in the basics, and went beyond that level for skaters who wished to stretch beyond their comfort levels. A great way for adults to begin skating or return after a long absence, Ice Breakers will resume on Monday evenings in October.