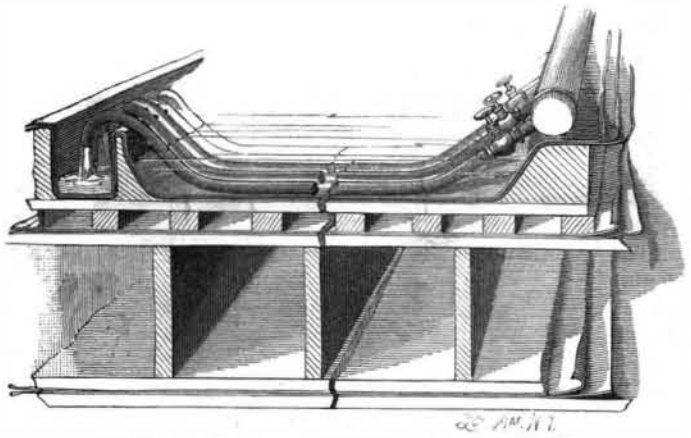
Chicago, who witnessed the terrible occurrence, sends the sketch we herewith present. The manner in which the floor was arranged to provide for the necessary ice is shown in the accompanying cut, in which the manner of arranging the brine pipes is given. Four thicknesses of specially prepared paper were laid over the entire floor. Upon this a false floor was constructed making every allowance and affording every facility for proper ventilation. On this false floor more insulating paper was laid, covered by a tank made of lead. One inch pipes for conveying the brine were laid lengthwise of the room, four inches from center to center, connected to a large main supply pipe four inches in diameter, at one side of the tank. By a stopcock connection the volume of brine was regulated. The brine from the main header, passing through these pipes, discharged into the trough at the opposite side. From this trough the brine was conveyed to the brine tank, and after proper cooling was again used.

The brine was turned into these pipes on July 3, and half the floor was satisfactorily frozen on July 10. The depth of ice designed to be obtained was six inches, and the surface of this was to be kept hard and smooth by flushing it when needed with water, which would freeze and give a new surface.

About 1:30 P. M., July 10, our Chicago correspondent went to the cold storage plant, and while in the office on the third floor, the alarm was given that the building was on fire. Every body in the office ran for their lives and successfully escaped.

It appears that flames had been discovered issuing from the extreme upper part of the tower, caused, as it now appears, from defective protection of the iron chimney which passed up through the tower. The firemen were quickly on hand, and a company of them twenty strong at once ascended the tower to the balcony just above the columns, as shown in our engraving, and here they were engaged with ropes in drawing up the hose pipes, to extinguish the flames above them, when, all of a sudden, to the horror of the spectators, the flames fiercely burst out from the lower part of the tower, far below where the firemen were at work. The retreat of the hosemen was thus



FLOOR AND BRINE PIPING ARRANGEMENT.

instantly cut off. Some of them tried to slide down the rope, which burned before they could do so; the others jumped and were mangled by the fall of a hundred feet to the main roof below. In all some twenty firemen lost their lives. It seemed scarcely two minutes after the flames broke out below before the whole tower was a mass of flames and then fell down upon the roof of the main building, which burned and roared as if it were a mass of shavings.

The engineer in charge of the boilers had the courage and forethought to draw the fires and liberate the steam before fleeing. By this delay he barely escaped with his life; but he probably saved the lives of many people, and prevented the destruction of much more property. The heat from the fire was intense, blistering buildings as far away as the Transportation building.

The monetary loss is estimated at about $200,000, with probably not over $10,000 insurance. It is believed that the number of lives lost will be fifteen, if not twenty.

TEST OF BEARING POWER OF PILES.

Before beginning the masonry for the Chicago Public Library building, which was to rest on pile foundations driven in clay, it was decided to submit a number of piles to a careful test to determine whether the assumed load of 30 tons per pile was safe. The test was made by the contractors for the foundation work under the supervision of Mr. Nicholas E. Weydert, Superintendent of Buildings, Chicago, Ill. A platform 7 feet × 7 feet, consisting of 12 × 12 inches yellow pine timbers resting on steel I-beams 15 inches deep, was placed on four piles, and on this platform pig iron was piled to a height of 38 feet. This arrangement is clearly shown in the accompanying illustration. The following is an abstract of Mr. Weydert's report on the test, which was published, with the accompanying cut, in *Engineering News:*

The test was commenced in the morning, January 6, a week after the piles to be tested had been driven. The surveyors marked points on top of the piles and took levels on them after the pig iron had been piled to a height of 4 feet, and the load was about 45,200 lb. This piling up of the pig iron continued irregularly, owing to the severe weather, until January 10, when it had attained a height of 21 feet and a weight of 224,500 lb. Levels were taken, but no settlement was discoverable. January 17, at 2 P. M., all the pig iron had been piled on; it had then reached the height of 38 feet, and the load on the four piles was about 404,800 lb., or about 50·7 tons per pile. January 18, levels were taken and no settlement was discovered. These levels were repeated January 20, after the above load had remained for three days; also January 28, after the load had remained for eleven days, in both cases no settlement being observable. Further tests not being deemed necessary, and the test hindering the progress of the work, orders were given January 29 to proceed with the removal of the pig iron. The four piles, therefore, sustained a load of a little over 50 net tons each for practically a fortnight, without giving any indication of settlement.

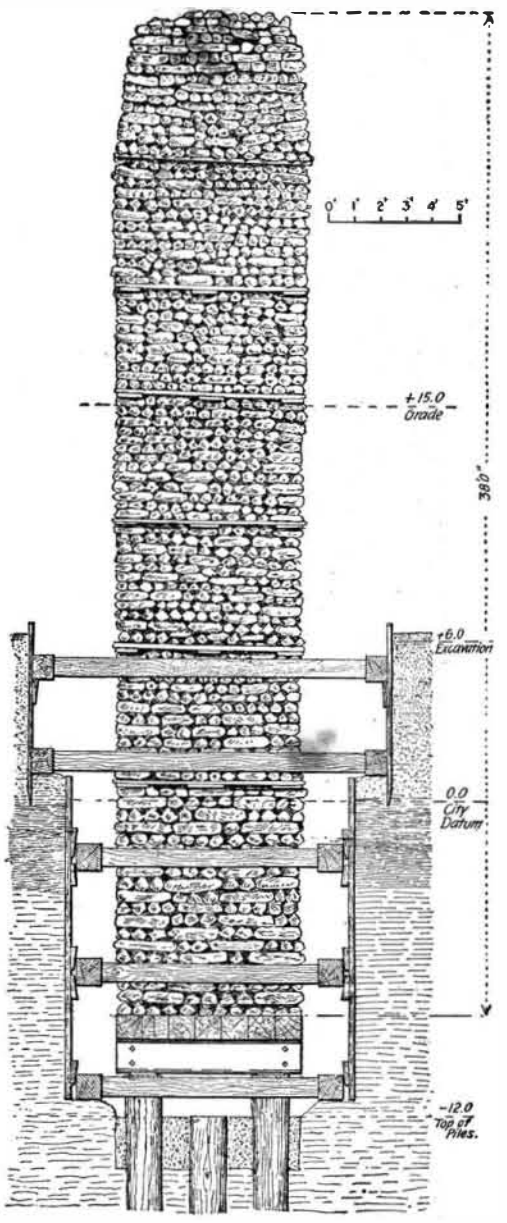
The piles were driven by a steam hammer of the Nasmyth type, made by the Vulcan Iron Works; weight 4,500 pounds; fall 42 inches, making 54 blows per minute. The last 20 feet were driven with a follower of oak. It was found that it required 48 to 64 blows to drive the last foot with the follower, and as the ratio of blows without follower to blows with follower is as one to two, it may be estimated that it would have required from 24 to 32 blows of the above hammer to drive the last foot directly, without follower. In the same soil it required about 16 blows of a drop hammer weighing 3,000 pounds and falling 30 feet to drive the last foot, with a follower, as above, and 32 to 36 blows of the same drop hammer falling 15 feet with a follower.

The piles were driven 2½ feet between centers, nearly, three in a row along the trench. This is deemed to be as close as they can be driven with ease. They were about 54 feet long and were driven about 52½ feet. They had an average diameter of 13 inches, circumference of 41 inches, and an area at tip of 80 square inches. If a pile similar to the test piles is left for 24 hours, it is found that it requires 300 to 600 blows of the above described hammer to drive it the last foot, or a repetition of 300 to 600 blows of 189,000 inch pounds each. The heads of the piles, after being sawed off, were 27 feet below the street grade, and the tips about 80 feet below the same. They were driven about 27 feet in soft, plastic clay, 23 feet in tough, compact clay, and 2 feet in hard pan. The bearing power of this hard pan may be estimated by Rankine's formulas at 170 pounds per square inch, and by empirical results at 250 pounds per square inch; in this case it may be a fair assumption that it would carry 200 pounds per square inch. The extreme average frictional resistance per square inch of sides of piles like those described, as deduced from experiments made under analogous conditions, may be placed at 15 pounds per square inch.

The average area of the tip of the above piles is 80 square inches. Therefore, their extreme point resistance will be 16,000 lb. The average surface of their sides is about 25,000 square inches, so that their total extreme frictional resistance will amount to 375,000 lb. As the point resistance in comparison to the latter is but small, it may be neglected, and the ultimate bearing capacity of a pile similar to the test piles may be estimated at 375,000 lb., or about 180 tons. But inasmuch as the ultimate crushing strength of wet Norway pine may not be over 1,600 lb. per square inch, or using a factor of safety of 3, 533 lb. per square inch, and whereas the minimum area of piles specified to be not less than 8 inches at the tip and 16 inches at the butt is about 113 square inches, each pile should not carry more than 60,000 lb., or 30 tons. This provides a factor of safety of 3 for the crushing resistance of the timber, and a factor of safety of 6 for the frictional resistance of the soil. If the timber be loaded to one-half of its ultimate strength, a load of 90,000 lb., or 45 net tons, may be assigned to one pile. But in the Library building, the conservative load of 30 tons per pile was adopted, which gives assurance that this building will not be likely to suffer from any want of strength in its foundations.

Milk Adulteration.

At the Paisley Sheriff Court an interesting point has been raised and decided. Some time ago a woman who retailed milk was prosecuted under the Food and Drugs act and was fined for adulteration. The farmer who sold her the adulterated milk raised an action against her for the price of it, but she refused to pay, alleging that she was entitled to set against the account the amount of the fine and expenses connected with the prosecution. Evidence was given to show that repeated complaint had, previously to the prosecution, been made to the farmer without effect, and that the milk, for the sale of which the woman was convicted, was sold exactly as it had been received. The sheriff held that the conviction under the Food and Drugs act was right, as the milk had undoubtedly been much adulterated with water. He further held that the woman, having sold the milk as she received it, was entitled to recover from the farmer the fine and

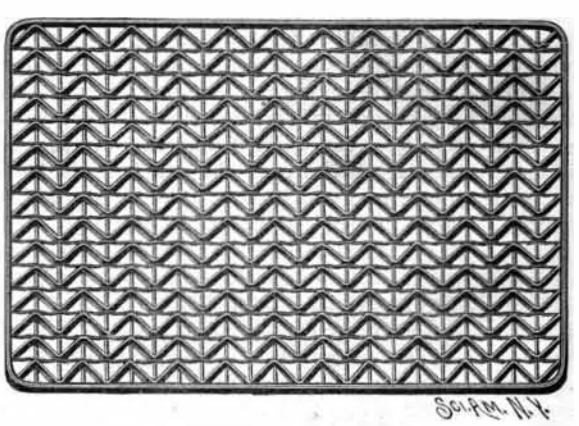


METHOD OF TESTING FOUNDATION PILES OF PUBLIC LIBRARY BUILDING, CHICAGO.

expenses of both actions, amounting to the sum sued for in the present action, and he gave judgment accordingly.

AN IMPROVED WIRE MAT.

This is a mat which is comparatively inexpensive to manufacture, and is very durable, while most efficiently serving the purpose for which such articles are designed. It has been patented by Mr. Joshua Horrocks, of No. 45 Cliff Street, New York City. The wire netting of this mat is braced in all directions, the wire meshes being crossed by continuous metal strips whose edges extend beyond opposite sides of the meshes, thereby forming a rigid structure well adapted to resist wear. The metal strips crossing the meshes are of a serpentine or zigzag construction, and their



HORROCKS' WIRE MAT.

edges face upward and downward, thus presenting surfaces which act most efficiently in removing dirt and foreign matters from the boots and shoes of those using the mat. This mat body structure is well adapted for various other uses, such as gratings, fencings, panels, etc.

ONE HUNDRED YEARS OLD, STILL IN PRACTICE.—Dr. DeBossy, of Havre, has passed his hundredth year. He is still in active practice, and at a dinner given in honor of his hundredth birthday, he made a speech in which he stated that his father had lived a hundred and seven and he intended to do the same.—*Med. Compend.*