

house. A portion of one of the pillars supporting the front wall of the Trust building was reduced to about half its ordinary size, appearing as if it had been shattered with the mallet and chisel of the stone cutter. The government warehouse, which was one of the oldest buildings in the burned district, was practically unhurt, with the exception of a stone column near the entrance in the interior. The effect of the heat upon this was to chip off its surface, so that it is now only about half its former size. The outside walls of this building, composed of ordinary brick, were practically unhurt, with no cracks appearing in any of them. Over a thousand barrels of liquor were stored in the interior, but so thick were the walls that the temperature did not rise sufficiently to ignite the contents of the building.

One of the most interesting features of the disaster was the way in which the new Baltimore court house checked its progress, although it stood directly in its pathway, and was probably exposed to a greater heat than any other structure. It was separated from the Law building, a seven-story structure, by only forty feet of space. When the Law building ignited, the fire was burning over an area of ten city squares southwest of it. Filled with inflammable material, its interior was soon a mass of flames, which were carried by the air current directly against the upper west wall of the court house, and at times extended thirty and forty feet over its roof. In fact, the fire was directly in contact with the wall for fully a half hour. The interior of this part of the court house was flooded with water, while the walls and ceiling were kept wet. On examination it was found that the window casings were charred, and some of the marble coping which surmounted the wall was broken, while the upper part of the wall was chipped and blackened. Not once, however, did the building ignite inside, owing to its massive construction. The exterior is of Maryland marble, which with the inner lining of masonry gives a thickness to the walls ranging from three feet to three feet six inches. The effects noted, as well as others, have led most of the experts who have visited the burned district to

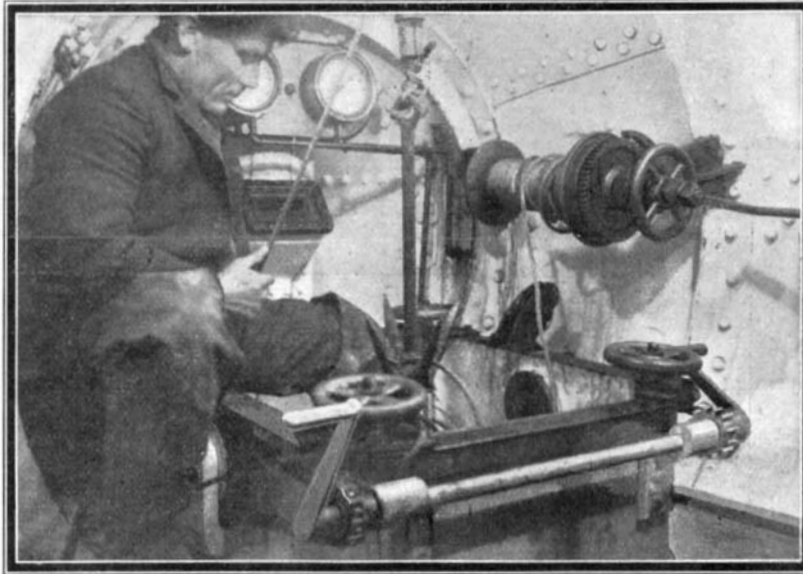
conclude that brick and terra cotta are far better building materials for resisting heat than almost any form of natural stonework; for even the outside walls of the older buildings, as well as division walls, though in many cases completely disintegrated, showed that the brick themselves were but little injured, and the bulk of them can be used for rebuilding if desired. Naturally, the steel framework of the office buildings has been subjected to close study; and although it was feared at first that it was subjected to such intense heat that the strength of the metal would be impaired, and

that it would be dangerous to use it as a support for any great weight, such as walls or floors, architects and erectors of steel-frame buildings in general are of the opinion that it is only necessary to remove the columns and girders which were warped and twisted, and replace them, when the structures will be as substantial as before the fire. Instrumental measurements show that none of the larger buildings are out of the perpendicular line. In all cases, however, it is agreed that the interiors must be entirely renewed. In many instances arched floors have either crumbled away or are so badly broken that they must be rebuilt. Much of the flooring consisted of a form of fireproof concrete laid upon the steel girders, and finished with tiling of marble and terra cotta. In the Union Trust and some other office buildings, most of the flooring fell through to the cellar. In the buildings where it remains, it is so loosely attached that nearly every day since the fire, portions have been falling, sections of three floors giving way unexpectedly in the Equitable building a week after the fire had been extinguished.

The leaders of the Baltimore fire department, as well as insurance men and others familiar with conflagra-

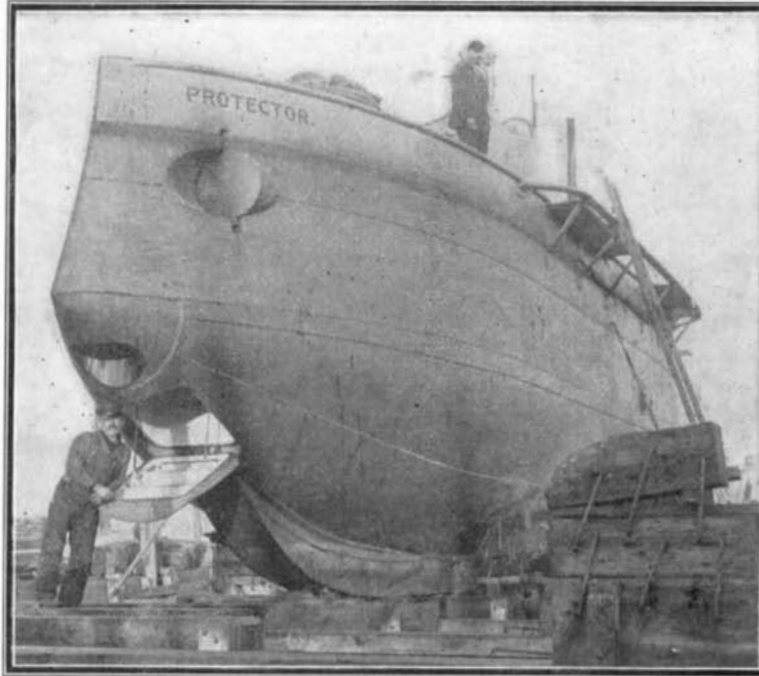
tions, have advanced some interesting theories as to the remarkable rapidity with which the fire spread over the burned area. When it started, the wind was not blowing a gale, as has been stated. In fact, its maximum velocity was not over thirty miles an hour at any time during the day. It is unnecessary to say, however, that as the number of burning buildings increased, and heat was generated in proportion, a draft was caused in the immediate vicinity of the fire, which possibly represented a gale in the force of the air current.

This artificial wind, as it might be termed, of course was blown toward the north and east, since it was aided by the ordinary breeze which came from the southwest. An enormous volume of hot air was driven ahead of the fire as the result of the atmospheric disturbance, and it is believed this had much to do with the spread of the conflagration. In fact, the heat was so great, even where the fire was confined to a single block, that persons on the roofs of buildings 500 and 600 feet away were unable to face it, and were obliged to leave them. When the flames had reached the



Copyright 1904 by R. G. Skerret.

The Diving Compartment, Showing Windlass and Grapnel Bringing up a Cable from the Sea Bottom.



Photos Copyright 1904 by R. G. Skerret.

The "Protector" in Drydock, Showing Diving-Compartment Door Open.



The Ice-Covered "Protector" After a Run. Army Board members on the deck and conning tower.

financial district, shortly before midnight, and the Continental, Baltimore & Ohio, and the Equitable buildings were on fire at the same time, it was impossible for any one to go within a square of this section, on account of the temperature. Consequently, it was absolutely impossible to attempt to throw a stream of water upon the fire from the north or east of these buildings, and many times during the day the firemen could not even reach the edge of the burning territory for the same reason.

The opinion has been advanced that in many cases the volume of superheated air actually set fire to structures 300 and 400 feet beyond the limit of the flames. The writer and other observers noticed several instances where buildings ignited in this way some time before the main fire reached them, flames and smoke issuing from the interiors, and not from the roofs. It might be said here, that as soon as the extent of the conflagration was realized, forces of men were sent to the roofs of all the buildings throughout the business district for a half mile or more around the burned area, in order to prevent them from being ignited by the quantities of sparks and cinders. In nearly every

instance the efforts made in this way with buckets of water, brooms, and sprinkling hose were successful, and thus far no other cause has been given for the manner in which some of the isolated buildings caught fire, except the action of the hot air penetrating the interiors.

Another proof of this theory is shown in the way buildings protected by "fireproof" shutters were affected. The rear wall of the Merchants' National Bank building was completely protected in this manner, every window being guarded by shutters of sheet metal, which were closed and barred on the day in question. A number of the large warehouses on Hopkins Place were also provided with shutters of the same kind, yet in nearly every instance they were burst open, apparently from some force within, and in a number of cases the opening of the shutters was followed by flames shooting from the windows, although no signs of fire were visible on the other sides of the buildings. An examination of the Merchants' Bank building on the day following the fire showed that every shutter had been forced open as stated.

It is generally acknowledged that only a change in the direction of the wind saved a much larger portion of the city from being destroyed, as the change turned the wave of fire and hot air southward, where it terminated on the harbor front. In the study of its ravages, the question has arisen if destruction of similar or even greater magnitude would not result in other cities, if the conditions were similar to those in Baltimore.

It is admitted that "skyscrapers" had little or no effect in checking the progress of the fire, and when it was once ablaze it could not be approached near enough for the firemen to do any effective work.

The Baltimore buildings, it is believed, were constructed as solidly and substantially as the average office buildings in New York, Philadelphia, or Chicago. In the latter cities these great structures are more numerous and built more closely together than in Baltimore, and many of the insurance officials especially are of the opinion that a fire in one of the cities named might do even more damage, if it passed beyond the control of the fire department.

#### OFFICIAL TEST OF THE LAKE SUBMARINE BOAT "PROTECTOR."

The test of the submarine boat "Protector," made by an Army Board recently, is fully described on another page. The accompanying illustrations show the appearance of the boat after rising under a huge cake of ice 8 inches or more in thickness; the interior of the diving compartment; and the bow of the boat when in dry dock. The last-named is the most striking picture. In it, the boat's prow has the appearance of a

huge, sinister face. The torpedo tubes appear to be the eyes; the bow anchor-weight hole, the nose; and the door of the diving compartment, the mouth of the huge sea monster. The interior view of the diving compartment shows the grapnel bringing up a cable through the door in the floor. The windlass at the side is used to haul up the grapnel after it has picked up a cable. The small rectangular glass in the front of the compartment is for looking at the bottom without opening the compartment door. The tube from this glass leads into the anchor weight hole in the bow, and so this window can only be used when the weight is out of its casing. The diving compartment is the great feature of the Lake submarine that distinguishes it from all others. The picture of the ice-covered boat tells its own story and shows that the new submarine is ice as well as waterproof, and could be used for breaking a channel by running under the ice and coming up under it, if it could be done in no other way.

The first discovery of coal in the United States recorded in history was in 1679, at a locality near the present city of Ottawa, Ill.