full of frost, frequently froze fast in the shafts; this was
obviated by introducing a steam pipe and thawing out each
charge.

The boulders which had been taken out of the caisson were
broken up into square blocks, and again built in below with the
cement. The general mode pursued in the filling was,
to build narrow bulkheads from three to four feet wide from
the floor to the roof all around. The sides being kept verti-
cal by boards, which were removed after concrete had
hardened. Next to the roof a shallow, sloping layer was
rammed in with narrow, flat-faced iron rammers. This place
required careful watching as it was apt to be slighted, and
yet was the most important point in all the filling. When,
in making the repairs of the fire, it became necessary to cut
out a considerable portion of the concrete, it was found that
the part next to the roof was the most compact portion of
the whole. Every layer of concrete was allowed to remain
for five hours before another was put on. The total quantity
required was about four thousand yards including the brick
piers.

The rapid influx of fresh water springs prevented any ma-
terial reduction of the air pressure. The water-shafts were
cut away below and filled up with concrete, to the line of the
roof. After the cavity was filled, and the air pressure taken
off, it was found that sufficient water leaked through the con-
crete to fill the shafts to the top. They were then filled from
above with concrete, lowered down in self-dumping buckets.
The caps to these shafts should have been provided with
small air-locks, so as to fill them in the dry. The water ris-
ing in these shafts was perfectly fresh, without a trace of salt,
which shows that the timbers will be saturated with fresh
water. Its temperature was remarkably high, seventy de-
grees, whereas, that of pure spring water is fifty-five degrees,
and of the river, fifty degrees. This would indicate that the
whole mass of timber and concrete must have been heated to
the temperature existing in the air-chamber, which averaged
from seventy to eighty degrees throughout the winter, and
was even greater up in the timber, where all the hot air was