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THE FINANCIAL IMPORTANCE OF RAPID BUILDING.

Not the least interesting feature of the lofty office buildings which are erected in large cities at present in the remarkably short time required in their construction. The history of the building of such a structure, the Broadway Chambers, New York, is given by the architect, Mr. Cass Gilbert, in the "Record and Guide." The building is 564 feet in plan and eighteen stories high, and was finished from foundation to roof in less than four months. Mr. Gilbert's article is as follows:

"The contract for the construction of the Broadway Chambers was signed by the George A. Fuller Company, builders, March 1, 1899, with Mr. W. H. Andrews, principal owner and trustee of the property. Wreckage of the old building on the site began May 2. Excavation followed, and under the old structures were encountered in supporting neighboring buildings and streets, and the work in this stage necessarily proceeded slowly. Newly founded piles were inserted under the buildings north and west, as it was necessary to go 12 feet or more below them. This was done without disturbing business in either of these buildings, and the old structures being left standing.

"Piles were sunk a short distance from the walls of the old buildings and cobbled with timbers, and the space between them was filled with earth, from the bed of which the old structures were raised above the water level. These piles were spaced about 10 feet apart, and a heavy post placed upright in the center of each, the same having been driven 8 feet into the earth. After these posts were placed the pits were filled again, with new piles were dug alongside of them. This was continued along the length of each wall until a series of vertical posts, spaced 8 or 10 feet apart, had been inserted with footing at the level of the new foundations. Needles were then inserted through holes in the sub-basement walls of the adjacent buildings, and supported well within the lines of the old buildings, the concrete then being poured about the piles and posts before mentioned, and the wall meanwhile being shored from the outside. The sand was then removed from the pit and the earth beneath the old walls, sheet piling being used to retain it where required, and the old buildings were thus found to be supported in the air some 12 feet above the proposed foundation. New foundation walls of brick with concrete footings were then put in, and when sufficiently set, the shortening and timbers were removed, and the space was then clear for the insertion of the foundations and the erection of the columns and piers of the Broadway Chambers.

"Up to this point the work was necessarily slow, and consumed nearly half the time required for the completion of the whole contract. It was not until about September 1 that the actual foundation work of the Broadway Chambers was under way. The concrete and steel footings (grillage) were then rapidly put in place. About October 1, the steel columns in the basement set, and by the 25th the columns were in place for a height of two stories above grade. On November 9 the columns were up to the seventh story, and from then on work went rapidly, notwithstanding the difficulty of getting material, which everyone encountered last year. By December 7, seventeen stories of structural steel were in place, the basement and ground story; three stories of granite had been erected, together with three stories of brick, and thirteen stories of terra cotta floor arches were in. On December 31, twenty stories of floor beams and the roof, twenty-one tiers of beams in all, were in place and the masonry was completed up to the twelfth floor. On January 4, 1900, the masonry
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paid in, say, ten payments of $100,000 each, at
intervals during the two years, this interest ac-
tount would be made up somewhat in this way:

Interest, two years, on $500,000 at 6...$150,000
Interest on $150,000 at 6, $20,000,
Total. ........................................ $150,000
or 15 per cent. on the cost of the new building.
I have used the 4 per cent. rate in this illustra-
tion because that is the common rate of interest
on first-class mortgages, but I have known some
important instances where the money was ob-
tained at 3½ per cent., or even less. It is obvi-
ous, whatever the rate, that the new building
should be constructed as rapidly as possible as
is consistent with good workmanship to save as
large a proportion of this interest as possible,
and to make the enterprise begin to earn as soon
as possible. For these reasons, then, and not
for the purpose of merely making a record in
rapid construction, such a building should, if
practicable, be erected within a year. It is of com-
paratively small advantage to finish it within
fourteen or sixteen months; for, assuming that
rents are negotiated from May 1, the building
must be completed before the first of next May,
or carried over into the autumn. In order to

A NEW TYPE OF ELECTRIC PROPELLER FAN.

The R. F. Sturtevant Company, of Boston, has
during the past year, remodeled its enclosed
motors designed for direct connection to pro-
peller fans and is now building a line of these
machines, from 18 inches to 120 inches in di-
diameter, with capacities of from 2,000 to 750,000
cubic feet of air per minute. The motor is of
the bi-polar type, entirely enclosed, and there-
by protected from dust, a most important ele-
ment in a machine used under these conditions.
In order to avoid the excessive temperature in-
cident to operation, this type has been very
carefully designed, so that a low temperature
rise can be maintained without greatly increas-
ing the size and weight above that of the ordi-
nary open-type machine. It is considered capable
of continuous operation for ten hours, with a
maximum temperature rise not exceeding 60
degrees Fahrenheit.

Yokes extending out from the field ring sup-
port the armature shaft. The end castings are en-
tirely independent and can readily be removed
to give access to the entire interior. The bear-
ings and brushes can be reached by remov-
ing the caps in the centre of the castings. The
brushes are of hard carbon, in holders of a mod-
ified reaction type, to allow of easy adjustment
when it becomes necessary to reverse the direc-
tion of rotation. The bearings are self-oiling
and self-aligning and fitted with composition
sleeves, removable from the outer ends of the
boxes.

The design of the propeller wheel is the result
of an extended series of comparative experi-
ments with different types. The delivery edge
is helical, and the form is designed so that the
air is picked up at the inlet edge of the blade at
low velocity, and when well under the influence
of the blade is accelerated to its maximum ve-
locity with the least amount of slip. As a result,
the efficiency is said to be extremely high. The
wheel is partially enclosed within a conoidal in-
let ring, to decrease the frictional resistance to
the entering air. The motor is accurately cen-
tered by means of a tripod support, and the en-
tire assembly may be bolted directly to the wall
through which the air is to be discharged. The
illustration serves to make clear the general
features of the design.