MID 19TH CENTURY COMMERCIAL BUILDING BY JAMES BOGARDUS

On May 3, 1849, *The Evening Post* of New York City announced its pleasure at having examined the new stores lately put up by Mr. Edgard Laing on the northwest corner of Washington and Murray Streets (fig. 1). It reported the stores had been commenced on the 25th of February last and constructed in the brief span of about two months.

In the same month of February, but 122 years later, the Anchor Demolition Corporation and Industrial Wrecking Company, Inc. of Brooklyn, N.Y. began the careful disassembly of the Laing Stores so that its cast iron parts might be used in the re-erection of the buildings as part of the City University of New York's campus in the Washington Street Urban Renewal area. Five weeks and three days later the operation was successfully concluded with the metal pieces scraped, weatherproof painted, labelled and stacked awaiting the future (fig. 2).

While the actual disassembly took a relatively short time, the preliminary negotiations by city and federal agencies; especially the New York City Landmarks Preservation Commission and the Housing and Development Administration, were lengthy, covering a period of six years. Efforts to save the Laing Stores were motivated by the fact that they represented an important phase in American architectural history, being not only one of the earliest examples of cast iron architecture in the U.S., but also the oldest then surviving, building of its kind in the country.

Two aspects of the contract recommended by the agencies involved were unique. First, permission was requested and received to permit " selected bids " so that the operation could be undertaken by a highly qualified firm whose record had proved its ability to successfully complete such a delicate project. Second, the contract specified that the entire process be throughly documented by photographs and measured drawings and that a report be written by an architectural historian acceptable to the Landmarks Preservation Commission. For this purpose the services of the writer was retained and a contract was entered into with Professor James M. Fitch, of Columbia University's School of Architecture and Director of its Preservation and Restoration Program. Contributing importantly were Professor Charles E. Peterson, Theodore Prudon and a crew of eight students under the field supervision of Benjamin Walbert and Stuart MacDonald, all of whom cooperated to produce the measured drawings, (now deposited with HABS), a number of photographs and slides.

Credit also should go to James C. Massey, Chief of the Historic American Building Survey, National Park Service, who generously provided measured drawings, pictures and preliminary documentation done by John W. Waite in 1966, as well as the services of Jack B. Boucher, the survey's architectural photographers. Other photographs were contributed by Jean O'Gorman and Cervin Robinson. Thanks to the aid of all, an official report is now in progress and an exhibition of some sixty, 16 × 20 mounted photographs depicting the disassembly operation will be ready for circulation in the Fall of 1972 by the Smithsonian Institute. What follows here is a report on the findings of the operation and an attempt to assess the historical significance of the Stores. To do this it seems best to divide the next into three sections : 1) the traditional brick and timber construction system; 2) the cast iron facade and 3) the manner in which the two were interrelated.

PART ONE : BRICK AND TIMBER CONSTRUCTION

For the most part the construction of the Laing Stores was not novel for its time. The floor and roof loads were supported mainly by a system of wood joists carried by brick party walls. The joists or beams as they were then called averaged 14 feet in length, were four inches thick and 13 inches high. According to measurements taken in 1894 by the architectural firm of John B. Snook and Sons of the corner store at 258 Washington Street, the joists atop the basement were 12 feet long × 5 1/2 inches thick × 9 inches high. Above the ground floor level they were 13 feet × 3 1/2 inches × 14 inches (fig. 3). At the third tier the measurements were the same. At the top storey the figures are 13 feet × 4 inches × 13 1/2 inches. No dimensions were given for the roof level.

The brick party walls were generally 12 inches thick except at the foundations where they were broadened by another 9 to 12 inches. Wherever possible the joists were inserted into the brick party walls at a 90 degree angle to a depth of four inches in an alternating fashion on either side of the walls so as not to weaken them any

Fig. — Laing Stores. (Photo: Jean O'Gorman.)

more than necessary and set approximately on one foot centres.

However, because of the parallelogram-shape of the stores, this system was departed from at the front and back corners where other devices had to be used. At the front, the tendency was to run a major beam parallel with the facade and nail smaller cheek-cut joists to it while inserting the other end into the brick wall. At the rear it was often necessary to rest the joists obliquely into two walls.

The reason for this not entirely satisfactory solution is to be found in the plan which is best illustrated in the drawing of the first floor (fig. 4). As can be seen the lot was divided into five stores, four facing on Washington Street and numbered 258, 258 1/2, 260 and 262. The fifth faced Murray Street and was numbered 97. This somewhat unusual arrangement resulted from the fact that Mr. Laing also owned and had erected two brownstone stores at 99 and 101 Murray Street and two other brick-fronted stores at 264 and 266 Washington Street using the corner site as a coal yard (fig. 5). Thus, when it was decided to build on this corner lot, the architect was limited in his opportunities.

Moreover, since Mr. Laing owned the stores flanking the corner site it was further decided because of the economy involved, to encroach upon the end walls of both sets of stores. Instead of building separate walls, the joists were inserted into the walls at 264 Washington Street on the north, and of 99 Murray Street on the west. This became quite clear when the buildings adjoining the Laing Store were torn down in the late 1960's revealing clearly the encroachment and at the same time producing an extremely dangerous structural situation (fig. 6). As can be seen in the drawing, the three most northerly party walls at 258 1/2, 260 and 262 Washington Street are not framed into the wall which once served as the easterly wall of 99 Murray Street (see fig. 4).

Prior to the start of the dismantling operation, this long thin wall, with little or nothing to support it, had to be secured by making openings through which timbers could be lashed on the outside by wire cables attached to joists on the inside (fig. 7). Thus, as a result of this somewhat strange set of circumstances, the stores took the form of five parallelogram-shaped stores arranged to form a larger one and thereby producing a number of construction problems.

In one respect the parallelogram shape of the stores prove to be something of a blessing. The shape led to the employment of smaller cheek-cut joists at the front and rear corners of the stores which were then nailed to a major beam at a number of points. This kind of construction tends to reinforce the wood-brick system and strengthens it. In the case of the Laing Stores with their iron fronts, reinforcement was especially needed at the points where the metal facade is attached to the inner shell and this is precisely where the cheek-cut joists are to be found. Whether this method was used deliberately or whether it was a happy accident is something we shall probably never know. What is known is that conscious efforts to strengthen the fabric were used. Where hoist openings and stairways were needed not only was the mortise-and-tenon technique used but also bridle irons of various sizes and thicknesses were apparently made on the spot to fit the location and function (fig. 8). In the lower stories where the load was greater the bridle irons are thicker and stronger. In the upper stories the tendency was towards lighter and thinner pieces (fig. 9). In addition, numerous strap irons measuring from 15 to 20 inches were laid obliquely across the party wall and nailed in three places at each end to the alternating joists, thereby creating greater rigidity and solidity. The impression created by the way in which the construction was managed as revealed by the disassembly operation is that the American workman of the mid-19th century was skilful, imaginative and inventive, capable of solving difficult structural problems quite effectively. As a matter of fact, there is every reason to believe that if the buildings on either side of the Laing Stores had not been demolished the latter might well have lasted well beyond the 122 years of their existence.

PART TWO : CAST IRON CONSTRUCTION

While the building technique of brick and timber was deepely rooted in the past, the employment of cast iron as a facade for the Murray and Washington Street fronts was relatively new. Turpin Bannister, in his article "Bogardus Revisited" *Journal of the Society of Architectural Historians* XV, 4, p. 15, mentions the Miner's Bank of Pottsville, Pa. erected by John Haviland between 1829-30 using a front of cast iron plates designed in the Renaissance manner.

Prior to that, in England, iron was used structurally and decoratively by the end of the 18th century for factories

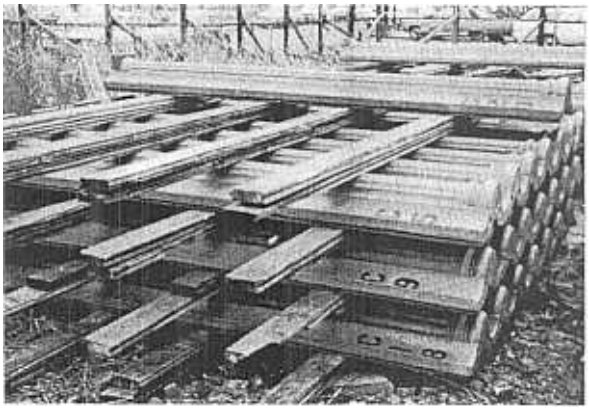

Fig. 2. — Stacked iron. (Photo : Author.)

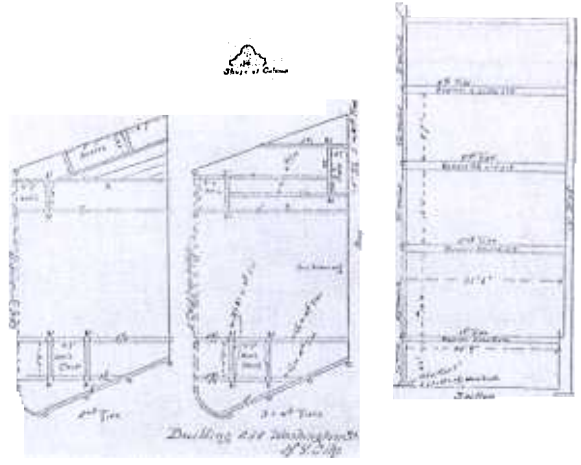

Fig. Snook Drawing.

Fig. 4. First Floor Plan. (Drawing - Stuart Mac Donal

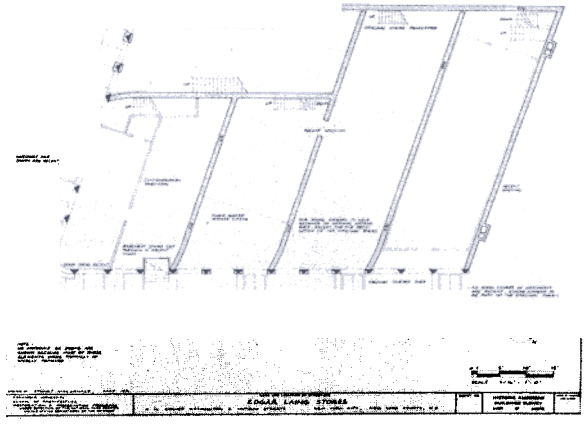

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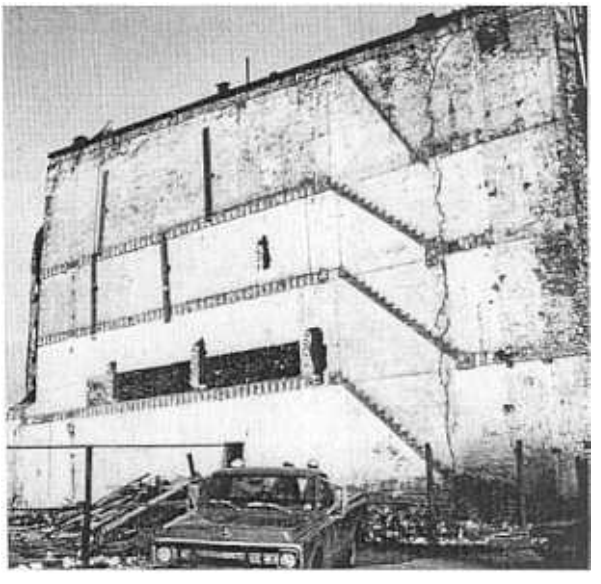
Fig. 5 *a-b*. — H.A.B.S. View with shed & flanking stores. (Photo : Country H.A.B.S.)

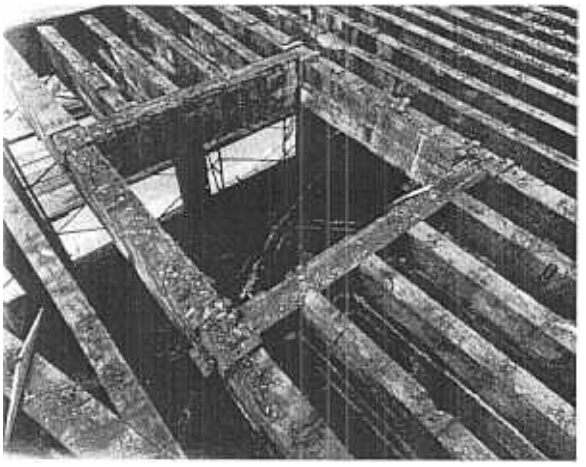
Fig. 6. — Encroachement View at 264. (Photo : Author.)

Fig. 7. — Securing West wall. (Photo : Author.)



and bridges. But it was not until the mid or late 1840s that the vogue was popularized in the States. It was considered so new in 1850 that Bogardus was granted a patent by the government for an iron building which was apparently in model form by 1847 but not completed until 1850 in part because the castings intended for his factory were used first in the Milhaud Store at 183 Broadway of 1848 and then in the Laing Stores. According to Bannister, Daniel Badger, whose Architectural Iron Works was responsible for literally hundreds of iron fronts and entire buildings in many sections of the nation, learned the iron trade in Boston where he opened his own business in 1829. In 1842 he set up shop in New York and enjoyed a prosperous practice for over a quarter of a century. Thus it can be said that though iron construction was known prior to the building of the Laing Stores, the first great wave of activity did not come until the mid-1850's and in 1849 the practice was fairly new.

It is then all the more remarkable that the system worked out by Bogardus should have been so simple, logical and faultfree. When *The Evening Post* in 1849 said that the cast iron pieces may be taken down, removed and put up again in a short time, it was reporting the unvarnished truth. Basically, Bogardus' formula involved four different structural parts : a column, hollow in section with flanged sides, a " C " shaped hollow beam strengthed at three places on the inner face with an iron strap-like member, one near each end and the third in the centre; a spandrel panel and a cornice composed of a crowning section bolted to a frieze (fig. 10).



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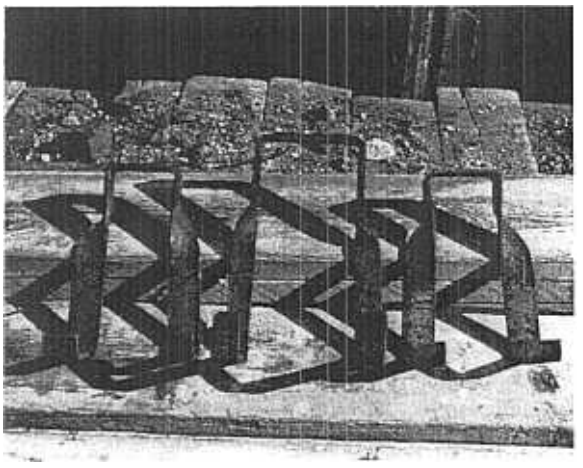

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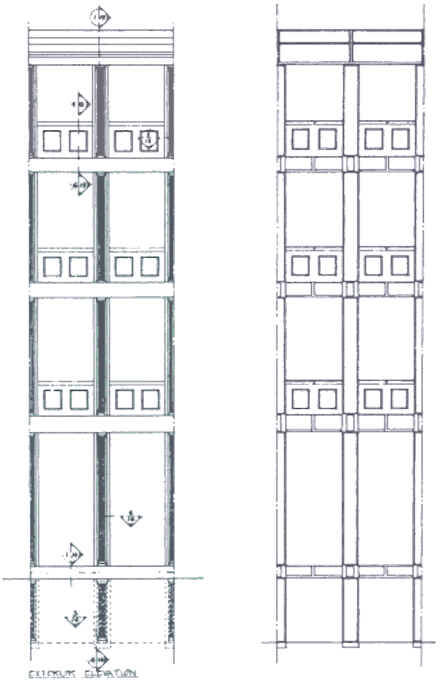

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Fig. 8. — Hoistway showing mortise & tenon & bridle irons. (Photo : Author.)

Fig. 9. — Bridle irons. (Photo : Author.)

Fig. 10. — Drawing of exterior & interior elevation. (Drawing : Edward Jendry.)

The columns were so designed as to straddle two adjoining beams to which they could be attached by two bolts passing vertically through both parts and fixed with a nut (fig. 11). The beams in turn which were machine planed so as to make certain that the columns rested evenly also contained openings laterally so that a bolt passing through from one to the next would fasten the beams together (fig. 12). A second column would then be placed at the same level at the juncture of the beam already in use and the adjoining one. This was secured in the same manner described above. Between the columns was set a 36-inch-long spandel panel which was supported by the use of two rivets an inch and a quarter long on each side driven into the columns about a third of the way from top and bottom of the panel. This procedure was then repeated at the next higher level to create a bay system which could be extended vertically and laterally until the building was topped off by the cornice. Thus by a simple and logical system consisting of a few different parts held together by wrought iron bolts, nuts and rivets it was possible to erect quickly, economically and functionally a facade capable of fulfilling the requirements of commerce for well-lighted space, which was durable, and was easily maintained by the simple application of a coat of paint.

The many advantages of iron construction were well understood immediately upon the completion of the Laing Stores. *The Evening Post* article, of May 1849, quoted earlier, had this to say : " Mr. Bogardus has spent many years in travelling through Europe for the purpose of studying and perfecting his plans; and they certainly combine more excellencies than any other in the city. These buildings will sustain greater weight, and are put up with less inconvenience, than brick buildings, being cast and fitted so that each piece may be put up as fast as it is brought on the ground. They may be taken down, removed and put up again in a short time, like any other casting. In their mode of construction nearly three feet of room is gained over buildings put up

Fig. 11. — Photo of colum base and bolted beams. (Photo : Courtesy H.A.B.S.)

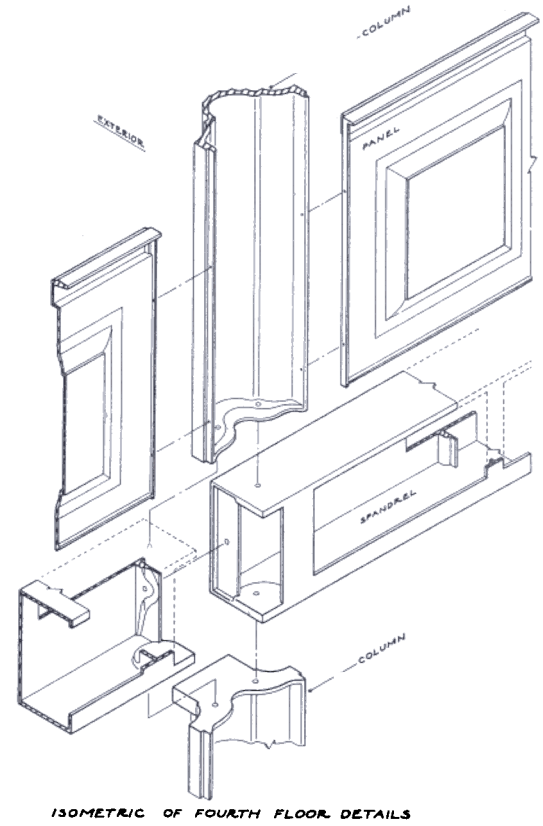


Fig. 12. — Isometric-drawing of 4th floor elements & Cormice Details. (Drawing : Stuart Mac Donald.)

with brick. They admit more light, for the iron columns will sustain the weight that would require a wide brick wall in ordinary buildings. They combine beauty with strength for the panels can be filled with figures to any extent.

" In construction each storey is supported by rows of fluted pilasters and cornices between which are compactly bolted. The walls are, in fact, one compact mass, and capable of sustaining inconceivable weight. The iron used weighs about 150 tons. The columns of the first storey were cast at the West Point Foundry; those on the second and fourth at Burdon's in Brooklyn, and the third and fifth at the Novelty Works. The cornice, facias and ornaments are the work of William L. Miller, N. 40 Eldrige Street... "

The lengthy quote just cited and subsequent researches of Walter Knight Sturgis and Turpin Bannister confirm the fact that in general the iron construction system used by Bogardus was understood by present-day scholars interested in the subject. There is every reason to believe that 19th century builders were well acquainted with the specific details of how to erect an iron building judging from the vast number that were constructed during the last half of the century. A brief investigation the Laing Stores was undertaken by the Historic American Building Survey of the National Park Service in 1966 but was limited by the fact that the building was still standing. So it might be said fairly that between that day and this all the particulars seem to have faded from view. The disassembly operation provided the opportunity to re-examine the problem and to check without conjecture the precise character of the construction system.

The fact is that the formula employed by Bogardus was not as simple as it seemed. Structurally speaking, for example, no mention has been made in the literature, to the knowledge of the writer, of the basement level. Thanks to cooperation of the Anchor company management and crew the operation was continued beyond the ground floor to permit an investigation of the

structural base (fig. 13, 14). It was discovered that columns like those used above were also employed below. These were shorter in height being about five feet six inches and three-quarters of an inch in thickness as compared to the 12 foot columns employed at the ground level (see fig. 3). These basement columns rested on a granite slab or pad which in turn rested on a layer of brick pavers. These sturdy columns carried beams similar to those already described.

This find was interesting in itself because the usual foundations found in the first half on the century were of the continuous type such as were used in the brick party walls consisting of brick and sandstone. At the base the brick was covered with a sandstone revetment capped by wrought iron clamps followed by several feet of sandstone rubble in courses and topped by brick to the roof. It is likely that isolated footings, replacing the continuous foundations, were not uncommon by this time but a firm dating concerning this question must await further study. What is historically significant about the practice at the Laing Stores is that by 1849 isolated footings involving iron columns to support the upper loads were in use.

Perhaps even more interesting was the discovery that in no way were the iron columns attached to the granite pads or blocks. The columns were neither bolted, clamped nor cemented. Those columns which were in good enough condition to be recovered were simply lifted off their pads by a " cat " after the debris had been cleared and the facts established (fig. 15).

Just why Bogardus decided against fixing these columns to the granite blocks is worthy of brief speculation. It is possible he believed the weight of the buildings and their interconnecting iron parts above would be sufficient to prevent shifting. But it is also possible that it was deliberately done to allow for uneven settling of the ground which consisted of fill for what was once the shore of the Hudson River. In the event of sagging this method would have permitted some part of the building to settle without endangering the entire structure. In addition, by this device it would be possible to jack-up the basement columns wherever and whenever it was deemed necessary. Whatever the reason, the appearance of isolated footings of this particular character in 1849 must be considered an important discovery in the history of 19th-century building technology.

Another advantage gained by the use of isolated footings was that it made possible additional space for storage and entrance to the basement level. While there is little reason to believe that Bogardus invented this system, it could be that he was responsible for refining it by the introduction of iron columns. It is known that at this time there was an effort to increase the amount of storage space as compared to the 17th and 18th century method which made use of the top storey for that purpose and was commonly found in north-western European countries such as Holland, Flanders

Fig. 13. — Photo of Basement level with granite stairs and column resting on granite pad. (Photo : Author.)

Fig. 14. — Drawing of Basement level. (Drawing : James D. Tobin.)

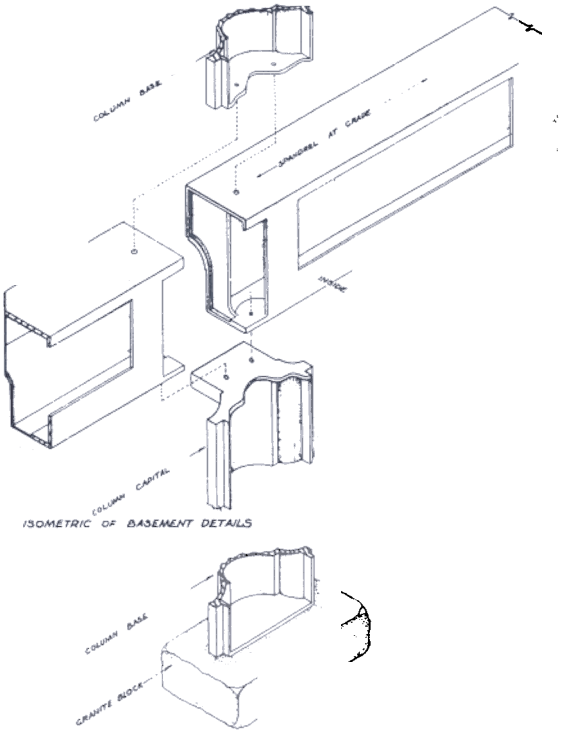
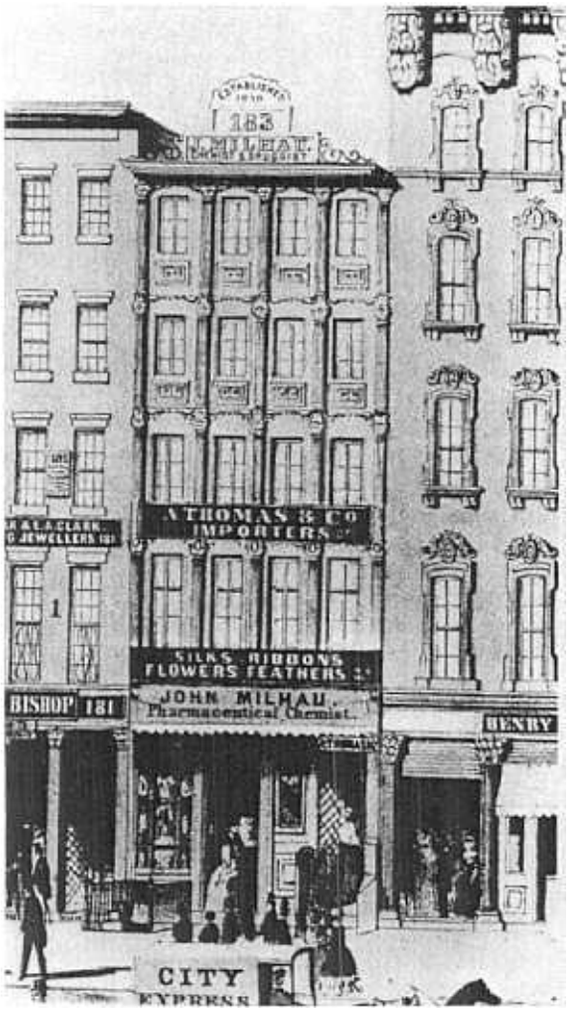


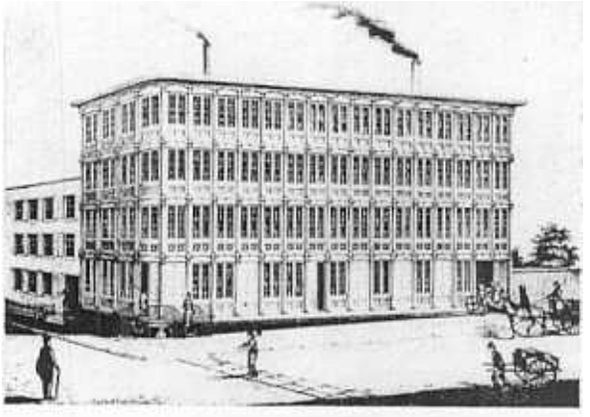
Fig. 15. — Basement colums. (Photo : Author.)

Fig. 16. — View of the Milhau Store in 1856. (Photo : Author.)

Fig. 17. — Ackerman Lithograph of the Bogardus Factory. (Photo : Courtesy Museum City of N.Y.)

Fig. 18. — Composition of spandrel panel plates. (Photo : Author.)





and England. But as the size of business grew and inventories swelled these areas proved too small and inaccessible.

By the mid-19th century ingenious builders were looking to other solutions. In 1848-49 Solomon Hoxsie in Philadelphia erected the Granite Block which employed hugh slabs which served as sidewalks above and the tops of basement storage space below. He went further by creating streets composed of granite slabs arranged so that two slabs supported at each curb met at the centre where they were held up by granite monolithic columns. The rest of the space beneath the street was intended for storage.

An undated view in the *Illustration of Iron Architecture* published by the Architectural Iron Works in 1865 of Daniel Badger shows how elaborate basement construction had progressed by that time. Plate 83 shows a view of a double basement extending under the sidewalk and part of the street involving glass blocks in the upper basement level through which light could filter to the basement below. The sidewalk consisted of an iron frame containing thick glass units. This was supported at intervals by an iron beam resting on iron columns at either end. The formula became so successful that it eventually was used almost everywhere in the business district of New York and elsewhere. Hundreds of examples remain to be seen to this day.

In conclusion, it should be noted that in both the Milhau Store of 1848 and the Bogardus Factory of 1847-49 basements occur. In the Milhau Store we have a solution originally used in the Laing Stores. To the left of the four-bay building can be seen in a view dated 1856 the heads of two people descending into the basement, the stairway being guarded by two iron railings (fig. 16). In a later view in Moses King's *Views of New York* published in 1895 the railings no longer appear and the opening is covered with hinged metal plates that could be opened when occasion demanded for storage. In the factory, the Ackerman View shows the ground floor level raised at the corner of Duane and Centre Streets with a double staircase separated to allow for a stairway between to the basement area (fig. 17). Figures are shown entering and leaving the two levels. Thus, it is clear that in all three closely related buildings a basement was a feature of the design.

The dismantling operation also shed much light on another aspect of cast iron construction mentioned by *The Evening Post* when it reported on the ornamental opportunities possible. An examination of one of the spandrel panels indicated that the two recessed squares

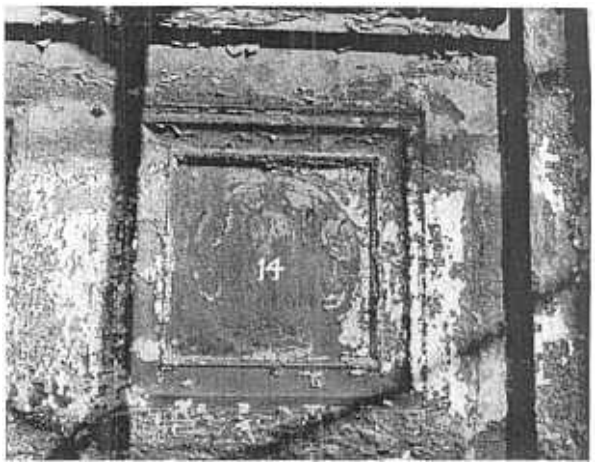


Fig. 19. — View of decorated panel plate with encircled starburst removed and small rivets for attaching same. (Photo : Author.)

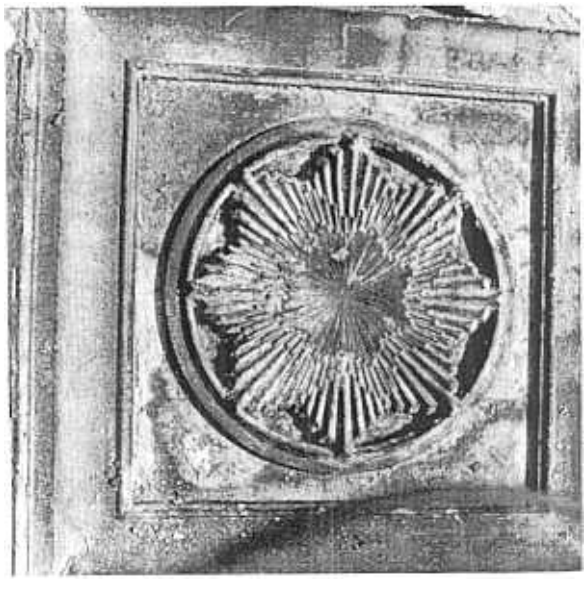


Fig. 20. — Encircled Starburst. (Photo : Author.)

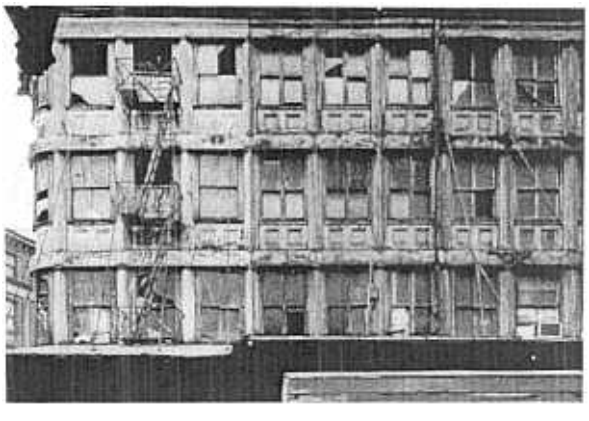


Fig. 21. — Beam ornaments at 2nd & 3rd tiers. (Photo : Country H.A.B.S.)

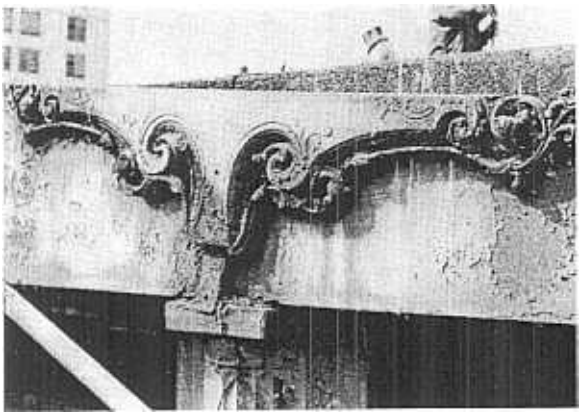


Fig. 22. — Beam ornament at 3rd tier. (Photo : John Grintza.)

Fig. 23. — Beam ornament at 1st tier. (Photo : Author.

within each were composed of a recess moulding backed by plates which were fastened in each case by eight wrought iron rivets, four at the corners and four at the centre of the sides (fig. 20). None of the squares on the third and fourth stories were decorated. However, it was discovered on the removal of the shed put up at a much later date, that the panels of the second floor contained two encircled starburst ornaments held to the plates by a set of three rivets arranged triangularly (fig. 19, 20). The limitation of the decoration to the second floor probably was an economy of Mr. Laing's. Mr. Milhau's Store on Broadway had starbursts on the fourth and fifth stories, although there is question as to what occured below (see fig. 16). A late view of the store in Moses King's *Views of New York* dated 1895 shows no panels were used on the third floor. The second floor is hidden from sight by a huge sign.

The Bogardus factory represented in the Ackerman lithograph was the most ornate of the three structures (see fig. 17). The short of Centre Street front shows unencircled starbursts in the recessed panels on the fourth and third floors. Those on the second storey contained encircled starbursts while those on the ground level had portraits in profile. On the Duane Street or long front, the fourth storey panels are undecorated as in the Laing Stores. Thus we have a considerable variety of combinations possible by an extremely simple means.

The Ackerman view also displays another form of decoration which also occurs at the Laing Stores, although its presence was not noticed until a close study was made possible by the removal of the shed (fig. 21). The reference is to the ornaments covering the juncture of the iron beams at every storey excluding the cornice. These were not purely decorative as they help to prevent water from seeping into these joints and rusting the bolts. But close inspection will indicate that while the first three storeys carry somewhat identical ornaments they are not precisely the same. Those on the upper two floors are shorter and separated whereas the ornaments on the lower storey are longer and continuous. Fortunately, a few pieces of both ornaments were salvaged during disassembly (fig. 22, 23). When compared they proved not only to be different in length but considerably different in style. The pieces atop the ground floor level were 72 inches long with a classical head at the beam juncture inspired by sculpture of the V century B.C. (fig. 24). The heads on the pieces above were chosen from a later Hellenistic period related to the Pergamon Altar (fig. 27). One is serene and untroubled with no show of emotion while the other has an agonized expression with deep set eyes and beetled brow. The entire piece is but 52 inches. In this instance the arrangement of the decor changes. In the Laing Store the second floor beams carried the longer members and the beams above, excepting the cornice, were covered with the shorter (fig. 26). So that with the limited vocabulary in panel and on beam it was possible to introduce a combination which in its day suggested to the beholder a variety despite the presence of a family resemblance.

PART THREE : INTEGRATION

The subject matter of this paper so far has dealt with the way in which the iron parts were assembled and how the metal fronts supported themselves. What follows concerns the relationship between the brick and timber construction and the cast iron.

It has been understood for some time now that the facades were in some way structural. Despite the fact that major scholars on the subject of 19th century building technology such as Turpin Bannister, Henry Russell Hitchcock and Carl Condit have touched upon this problem in general terms, they have not dealt with particulars. Why this should have been so is not difficult to understand because prior to 1971 the load-carrying members were hidden from sight. The recorded

Fig. 24. — Head on ornament atop ground floor level. (Photo Cervin Robinson.)

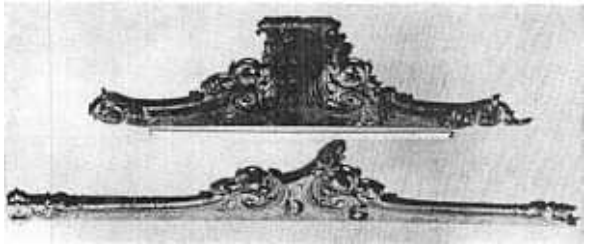
Fig. 25. — Head on ornament at 2nd & 3rd floor levels. (Photo P.S.U. Photo Service.)

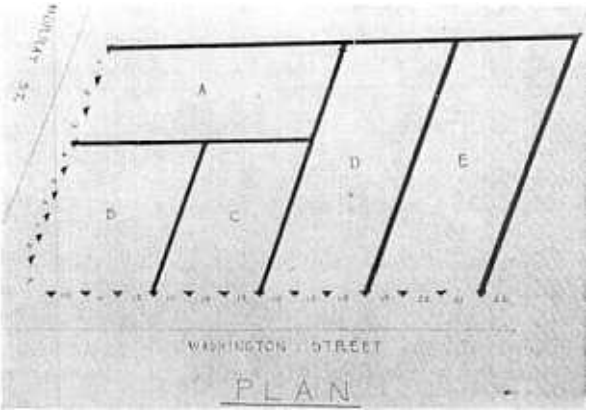
Fig. 26. — Comparison of beam ornaments. (Photo : P.S.U. Photo Service.)

Fig. 27. — Plan of Bay numbering system. (Drawing : Benjamin Walbert.)

dismantling operation, however, provided the answer. The only place where the iron, in part, supports the floor and roof, by virtue of the use of wood joists, is along the southerly side of 258 Washington Street; that is to say along the Murray Street front from Bay 4 on the plan to Bay 9 at the corner of the two streets (fig. 27). In all other places a heavy wood beam running parallel with the metal fronts rest on the party walls and is used to nail the shorter, cheek-cut joists at the corners where they are made necessary by the parallelogram shape. The space between the beam and the iron front is about nine inches. Holding the two together are an assortment of strap irons designed to be fixed to the timber and brick walls and then into the flanges of the iron beams. More on this later.

At the roof level of 258 an interesting construction was revealed which appeared nowhere else. It consisted of a broad beam set at an angle across the width of the store at Bay A9 so that one end rested on the ledge of the cornice frieze with the other enframed into the party wall of 258 1/2 about halfway down its length. On the easterly side of the beam were eight cheek-cut end joists diminishing in size as they approached the party wall into which they were inserted.





The first of these joists was not cut or nailed but was placed on the iron ledge against the beam and was held in place by a strap iron spiked to the joist and ending in a pin angled into the lip of the ledge so as to prevent slipping.

On the other side of the beam, nine joists becoming progressively larger in size were cheek-cut and nailed to the beam while the other end rested in random fashion on the ledge of the cornice freize facing Murray Street. These were held in place by spike and pin strap irons. Farther to the west other joists followed a simpler pattern inserted into the party wall on the north and resting on the ledge of the cornice frieze on the south (Murray Street).

The reason for this rather complex construction is not difficult to find. Since the builder had to support his roof timbers on the south by an iron ledge without flanges or compartments, the only way he could be sure that the joists would not slip dangerously was to attach the greater part of them by nails into a beam angled almost diagonally across the store. This gave the roof the needed rigidity. What should not be lost sight of, however, was that by this device the cornice frieze became a load-bearing member.

At the lower levels, with but few exceptions caused by the parallelogram shape, the joists were placed in the party wall and then into slots created by flanged elements in the hollow " C " shaped iron beams (fig. 28). As can be seen in the framing for the third floor ceiling a joist running parallel with Washington Street is carried by the iron beam on the south in Bay 9 and then by the party wall on the north.

In this case the first five joists are cheek-cut and nailed to the wood beam while the remainder but four at the rear are inserted into the iron beams on Murray Street. The latter are set obliquely into the easterly brick wall of 97 Murray Street, the southerly wall of 258 1/2 Washington Street or nailed to a joist forming a hoistway at that corner (see fig. 28). Once again, it can be seen that the load-bearing character of the cast iron is limited, involving only Bays 4 through 9 on Murray Street. In other terms what the disassembly process made unquestionably clear is that the prime function of the iron facades of the Laing Store was practical and esthetic even as *The Evening Post* suggested. Bays 1-3 and 10-21 were not only non-supporting but indeed had to be bound to the brick and timber interior by strap irons of various kinds in the walls and wood beams. It is at 258 that the transition to iron framing takes place and then only in a limited sense.

Up to this point the interrelationship between the cast iron frame and the brick and timber construction has been structural in nature. But since there was no absolutely secure system at hand other than the limited one of framing the joists into the iron as well as the brick the builders decided to use other means of tying the two together. Figure 38 shows one formula which involves a handmade wrought iron strap shaped so that an " L " shaped end clamps the flange of a beam and

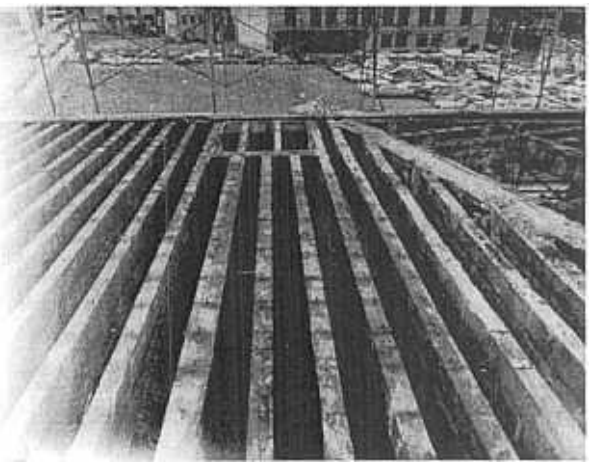
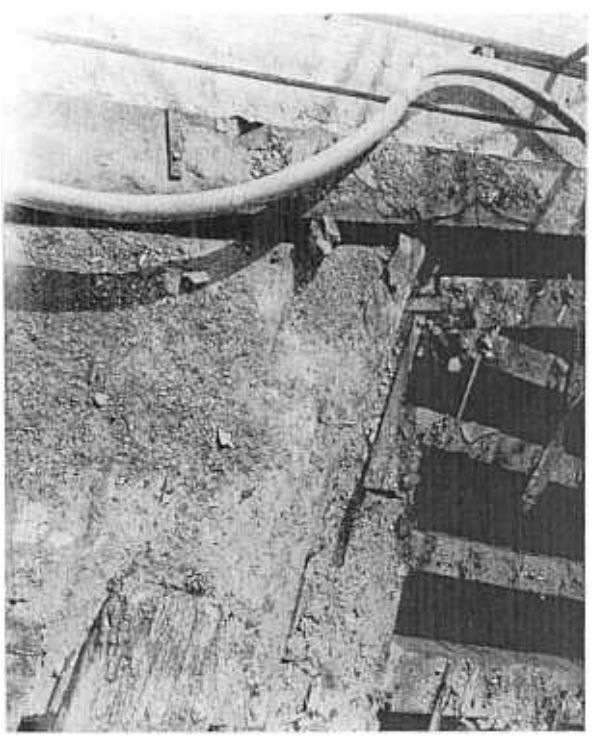


Fig. 28. — View of easterly end of 258 Washington Street. (Photo : Author.)

Fig. 29. — Strap irons used to secure iron front. (Photo Author.)



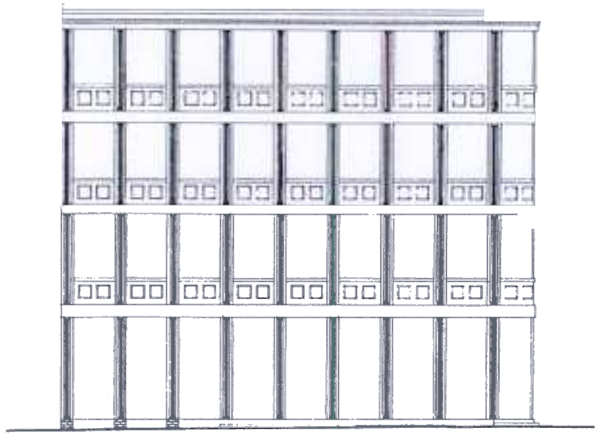
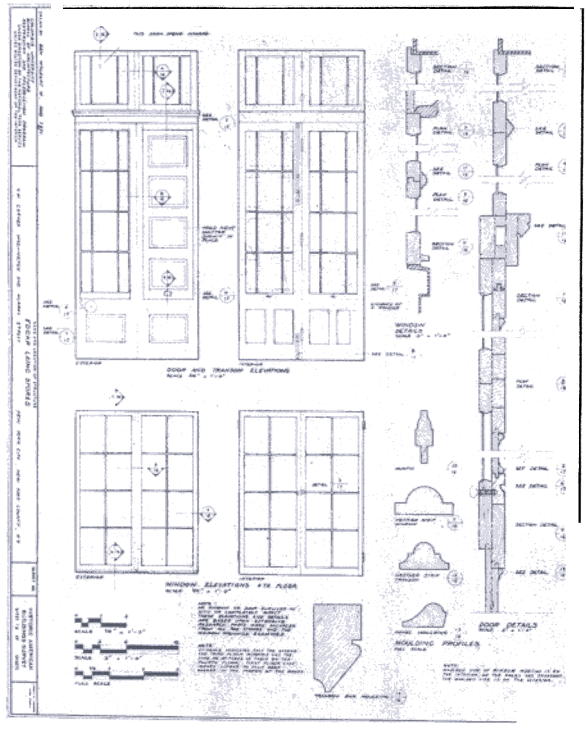


Fig. 30. — Murray Street Elevation. (Drawing : Edward Gentry.)

Fig. 31. — Conjectural drawing of woodwork. (Drawing Benjamin Welbert.)



is then twisted so that it lies flat on a brick party wall and is finally bent vertically to allow the brick and cement to cover it. As can be seen the iron front which faces Washington Street is quite separate from the flooring so that the only element holding the facade to the interior at this point is the strap iron.

Another method of achieving the same goal is illustrated in figure 33 where the strap iron is again held by a beam flange and then spiked to a joist which rests against the party wall at 97 Murray Street. A third variation can be seen in figure 34 where two joists join near the westerly wall of 97 Murray Street, are then reinforced by a square " S " shaped strap iron which was designed to hold the iron front and wood joists together. In this case the westerly wall pulled away despite this effort to join the two, indicating that such devices could not be relied on absolutely and that the best insurance might demand a combination such as can be seen in figure 29 where the type of strap iron discussed in figure 32 is covered by a smaller and simpler one mentioned before which merely crosses the party wall and is nailed to two joists running parallel to the iron facade.

While the careful disassembly of the Laing Stores added greatly to our technological knowledge of 19th century American architecture, the full story cannot yet be told. The number of alterations made during the life-span of the buildings makes it practically impossible to reconstruct certain areas with surety. On both the Washington and Murray Street fronts the beams over the basement columns have been altered apparently to effect easier entrance into the basement or to heighten the ground floor storey. At 97 Murray Street three brick pads with iron plates were inserted under the first floor columns when the floor was lowered to provide greater storey height. On Washington Street iron beams were cut through in order to change the basement entree. These alterations corresponded to others made at the ground level so that one can only conjecture about the arrangement and the details of doorways, display windows, etc. Much the same can be said of windows and woodwork in the upper storeys (fig. 31). Little, if any of the original hardware could be identified with certainty.

But despite these gaps, it would appear that the major goals of the operation were realized. The iron elements were saved by and large. When certain parts of the ornament could not be saved because of destruction by man or the elements moulds were made which will permit the units to be made to the number required. Speculation as to the structural and ornamental character of the Stores is so longer necessary. And the historical significance of the Bogardus buildings is clear. They were truly transitional, linking the past and the future, possessing old and new construction systems. The latter were going to change the architectural face of the nation by the late 19th century.

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Fig. 32, 33, 34. — View of strap iron useage.
(Photo 32 : Author. Photo 33-34 : John Grintza.)

Fig. 1. — Le magasin Laing. (Photo : Jean O'Gorman.)
Fig. 2. — Colonnes de fer empilées et classées. (Photo de l'auteur.)
Fig. 3. — Vues en plan et coupe transversale exécutée par la firme Snook.
Fig. 4. — Plan du premier étage. (Dessin de Stuart MacDonald.)
Fig. 5. — Le magasin avec les constructions attenant de part et d'autre. (Photo : Historic American Buildings Survey.)
Fig. 6. — Alvéoles des poutres visibles après la démolition du nº 264 de la rue Washington. (Photo de l'auteur.)
Fig. 7. — Travaux de fixation du mur ouest. (Photo de l'auteur.)
Fig. 8. — Treuil de levage (construction à tenon et à mortaise avec brides de fer dans les angles). (Photo de l'auteur.)
Fig. 9. — Brides de fer. (Photo de l'auteur.)
Fig. 10. — Schéma de l'élévation extérieure et intérieure du mur. (Dessin d'Edward Jendry.)
Fig. 11. — Base d'une colonne avec poutres boulonnées. (Photo : H.A.B.S.)
Fig. 12. — Système de construction de la façade au niveau du 4e étage, avec détail de la corniche. (Dessin isométrique de Stewart MacDonald.)
Fig. 13. — Photo prise au niveau du sous-sol, montrant les marches en granit et une colonne reposant sur une dalle de granit. (Photo de l'auteur.)
Fig. 14. — Système de construction adopté pour le sous-sol. (Dessin de James D. Tobin.)
Fig. 15. — Colonnes du sous-sol. (Photo de l'auteur.)
Fig. 16. — Le Magasin Milhau en 1856. (Photo de l'auteur.)
Fig. 17. — Lithographie d'Ackerman de l'usine Bogardus. (Photo : Musée de la Cité de New York.)
Fig. 18. — Vue d'un tympan sans ses plaques décoratives. (Photo de l'auteur.)
Fig. 19. — Vue d'une plaque après enlèvement de son motif décoratif. On aperçoit les petits rivets servant à maintenir celui-ci en place. (Photo de l'auteur.)
Fig. 20. — Motif décoratif : coquille en forme d'étoile. (Photo de l'auteur.)
Fig. 21. — Décoration des poutres des deuxième et troisième étages. (Photo : H.A.B.S.)
Fig. 22. — Décoration d'une poutre du troisième étage. (Photo : John Grintza.)
Fig. 23. — Décoration d'une poutre du premier étage. (Photo de l'auteur.)
Fig. 24. — Motif décoratif à tête humaine au-dessus d'une colonne du rez-de-chaussée. (Photo : Cervin Robinson.)
Fig. 25. — Motif décoratif à tête humaine, deuxième et troisième étages. (Photo : P.S.U. Photo Service.)
Fig. 26. — Comparaison entre deux motifs décoratifs pour poutres. (Photo : P.S.U. Photo Service.)
Fig. 27. — Système de numérotation des travées. (Dessin de Benjamin Walbert.)
Fig. 28. — Extrémité est du 258, rue Washington. (Photo de l'auteur.)
Fig. 29. — Ferraillage de la devanture en fonte. (Photo de l'auteur.)
Fig. 30. — Façade, côté Murray Street. (Dessin d'Edward Jendry.)
Fig. 31. — Dessin conjectural de la charpente en bois. (Dessin de Benjamin Walbert.)
Fig. 32, 33, 34. — Emploi des fers. (Photo 32 : photo de l'auteur; Photos 33-34 : John Grintza.)