Publications of the

BRITISH FIRE PREVENTION COMMITTEE.—No. 12.

Edited by Edwin O. Sachs.

THE

EFFECT OF FIRE.

A Report

ON

THE HORNE BUILDING FIRE,

PITTSBURG, U.S.A.

With Fourteen Plates and Illustrations.

BY

GUSTAVE KAUFMAN, M. AM. SOC. C.E.,
Consulting and Contracting Engineer.

EMIL SWENSSON, M. AM. SOC. C.E.,
Gen. Supt., Keystone Bridge Works, and Carnegie Steel Co., Ltd.,

AND

F. L. GARLINGHOUSE, C.E.,
Chief Structural Engineer, Jones and Laughlins, Ltd.

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OBJECTS:

The main objects of the Committee are:—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee does not hold itself in any way responsible for the opinions expressed, or methods advocated, by members and others who kindly contribute to these publications.

Comments on the opinions expressed in these papers, or further information on the subjects under consideration, are cordially invited by the Executive, at whose discretion they will be circulated among the members of the Committee.

NOTE.

In editing this series of publications, I have been at pains to arrange the issue of the various papers, if possible, contemporaneously with the discussion of events on which the contributions in question have a direct bearing.

On the 6th December, a valuable paper was read before the Royal Institute of British Architects, dealing with recent methods of so-called "fire-proof" construction practised in the United States, whilst the evening journals of that day were almost at the same time reporting the complete gutting of the upper portion of a structure of this description in New York. These reports seen side by side with the paper at the Institute, could but leave a curious impression.

It hence struck me that some authentic particulars of a large fire in a modern American building, might be of considerable use to architects and engineers, and the editor of the "Insurance World," Pittsburg, having courteously placed such particulars of a fire that occurred at Pittsburg, at the disposal of the Committee, together with the necessary illustrations, I am now venturing to put the data so kindly presented before the Members of this Committee.

The particulars here take the form of a report by experts to the insurance offices pecuniarily interested in the fire described and there is no doubt that as far as thoroughness is concerned, there are few, if any, reports that have been so carefully framed, or have been so elaborately illustrated by diagrams. It not only does very great credit to the insurance companies interested to have asked for a report of this kind to be framed on the occasion of the adjustment of their fire loss, but also to the gentlemen entrusted with this report to have approached their subject on the lines here shewn. If only reports of this kind were attempted in England, I am sure we should benefit very considerably by them, and in this respect as in many other matters relating to fire prevention, we can do well to look to the United States for practical suggestions.

It is not my purpose to comment on the Pittsburg fire, but I would particularly draw attention to the diagrams which so clearly explain the effect of a fire on an example of the modern forms of construction recently under consideration.

In closing I would express the indebtedness of the Executive of this Committee to the Editor of the "Insurance World," Pittsburg, for his very valuable assistance given in the production of this publication.

EDWIN O. SACHS.

London,

December 14*th*, 1898.

THE

EFFECT OF FIRE

ON THE

Horne Building, Pittsburg, U.S.A.

HISTORY OF THE FIRE.

A map of the burned district is shown on page 9.

For a graphic account of the fire we quote from the *Engineering News* as follows:—

"According to the best available information, the night-watchman for T. C. Jenkins' grocery store first became aware of fire while making his rounds at 11.45 p.m., but it was some little time before he finally located it in a barrel of paper, rags, scraps from the employes' dinner baskets and similar refuse which stood at the bottom of the elevator shaft. For some time—about fifteen minutes as estimated by the watchman—he fought the fire with a chemical fire extinguisher. Finding his efforts to be to little purpose and the flames rapidly ascending the elevator shaft, the watchman sent in a call for the fire department. The engines responded promptly, but so great had been the previous delay that the time of their arrival was 12.20 o'clock a.m. Ten minutes later the flames burst through the windows of the building, and at 12.45 o'clock every floor was burning fiercely, the flames apparently being fed by the large stores of oil, sugar, molasses, hams, etc., with which the building was filled.

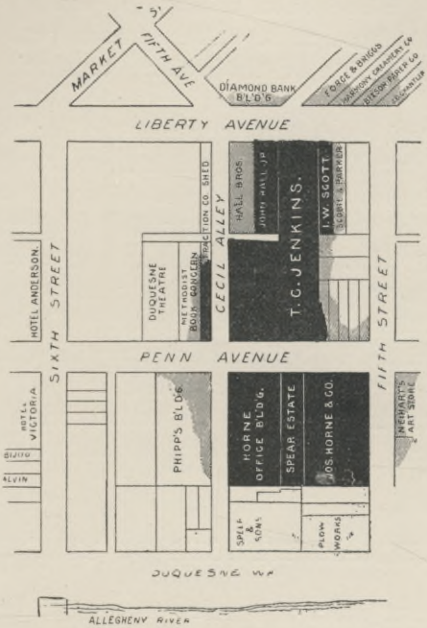
"The firemen had for some time previous abandoned the hope of saving the Jenkins building, and had turned their streams upon the large dry goods store of Joseph Horne & Co., and the neighbouring office building, also belonging to Joseph Horne & Co. Despite their efforts, however, the woodwork of both these buildings, near the tops, began to burn at about 1 o'clock, and a few minutes later the flames from the Jenkins building had leaped the street and set fire to the inflammable contents of the dry goods store windows. At almost the same time the office building began to burn. From this time on the spread of the fire was rapid, and a few minutes, according to reports, were sufficient for both the office and the store buildings to become a mass of flames so fierce as to drive the firemen from Penn Avenue and Fifth Street to the roofs of the buildings surrounding the fire.

" From these points of vantage at the rear of the Horne buildings on the far side of Fifth Street, and from the windows of the Methodist Book building, the firemen directed their streams and prevented the flames from crossing Fifth Street or reaching the rear of the Horne buildings, but the narrower Cecil Avenue was passed. The new Phipps office building was badly scorched, and the Methodist Book building above the fourth floor was completely gutted of its contents.

" In approximately two hours from the time of its first discovery, therefore, the fire had destroyed the three larger buildings of the group shown in the site plan, a half dozen smaller structures, and had damaged severely a number of other structures adjacent to the centre of the conflagration. To resist its progress the entire fire department of the city of Pittsburg and the neighbouring city of Allegheny had been called upon."

DESCRIPTION OF THE BUILDING.

The Horne Store building is a building 177 feet 2 inches long and 118 feet $2\frac{1}{2}$ inches wide, centre to centre of columns. The arrangement of the columns and the location of the stairways, elevators and light well are shown on the accompanying diagrams. The building was of modern steel construction, all walls being carried by a steel frame. It was six storeys high, besides the cellar. The front elevation was about 119 feet high and the rear was 113 feet high, thus giving a sloping shed roof. There were four longitudinal rows of columns and six transverse rows. The tops of the columns were connected by steel girders running longitudinally. These girders were generally composed of two web plates, four angles, and top and bottom flange plates, and rested



upon the extended cap plates of the columns. To the sides of the girders were attached shelf angles. Upon these the floor beams were supported and were rivetted thereto by two $\frac{3}{4}$-inch rivets. The floor beams were generally about five feet apart centre to centre, and consisted of single 15-inch 50 pound I beams. The sixth storey columns were connected longitudinally by means of 20-inch 64 pound I beams. To the top of these were rivetted the roof beams, consisting of 10-inch 25 pound I beams spaced five feet apart. Upon the roof beams were laid 5-inch 3·7 pound T's, spaced 18 inches apart and upon which were laid book tile to form the roof. From the roof beams the ceiling was suspended by means of $\frac{3}{8}$-inch rods. These rods were 12 inches apart, transversely, and carried at their lower ends $1\frac{1}{2}$ inch 2·5 pound T's. The length of the rods in the front of the building was 9 feet and in the rear of the building 3 feet, thus forming a horizontal ceiling. Upon the ceiling tees were also laid book tiles. There was no protection given to the bottom side of the ceiling tees other than the plaster.

All the steel work was covered by hard clay tile as shown on Plate No. 14. The floors were constructed of hard clay arches and were of the side construction type. The bottom of the beams and girders were protected by fire clay tile, which was attached to the same by means of sheet iron strips, and for which there was no protection except that given by the plaster. The column protection consisted of hollow hard clay tile which was put on in a manner much better than usual.

Detail drawings showing the construction of the columns, girders, floor arches, etc., are shown on Plate No. 14.

GENERAL EFFECTS OF THE FIRE.

The general effect of the fire on the building is clearly shown on the accompanying photographs, which were furnished by the *Insurance World* for the purposes of this report.

The wreck of the eastern side of the building was caused by the falling of the water tank, weighing when filled 26 tons. This was supported by I beams, the dimensions of which could not be ascertained. The widely published statement that the tank was supported by wooden beams is erroneous. Judging from the warped and weak condition of the remaining ceiling tees in the western part of the building, a fair surmise would be that the ceiling underneath tank, which was located right outside the elevator shaft, gave way under the heat, which there was no doubt fiercer than at any other place in the building. The fall of the ceiling exposed to the action of the heat, the unprotected columns

of the sixth storey between the ceiling and the roof, and also the roof beams and those supporting the tank. These no doubt yielded on account of their loads and the action of the heat and thus permitted the heavy tank to fall. The tank in falling carried with it to the first floor such columns and beams with which it came in contact, and which in turn dismantled a number of beams and girders to which they were connected.

The Board did not make a critical examination of the fireproofing because the determination of the amount of damage done to it was one of its duties. It is pertinent, however, to say that many of the lower webs of the floor arches dropped out, and that a great deal of the fireproofing on the underside of the beams and girders also fell off. The former, your Board believes, was due to the lateral movement to which the building was subjected by expansion and contraction, and the other to the doubtful method of attachment. The ceilings of the upper floors were not subjected to any force of water.

WALLS.

The east and west walls were first examined to determine the amount that they were out of plumb. For these observations a fine transit instrument in perfect adjustment was used. It will be observed from the photograph facing page 7, that the first storey had limestone facing terminating at the second floor with a projecting cornice, and that above this the walls were brick. At the fifth floor there was another projecting cornice. These cornices prevented a continuous observation of the corners, and it was, therefore, necessary to determine the plumbness of the corners by taking at least two sights, one at the ground floor and one at the second floor. This was necessary because the brickwork was not in exact alignment with the limestone.

South-west corner.—From the ground floor to second floor the corner is plumb. From the second floor to fifth floor it leans towards Fifth Street, or westward, 2 inches. The wall is perfectly plumb in the other direction, *i.e.*, it did not lean towards or from Penn Avenue.

North-west corner.—From the ground floor to second floor the corner leans northward 1½ inches. From the second floor to the fifth floor the building is plumb.

East wall.—The upper portion of this wall bulged badly, and some part of it was gone; other parts of the wall appeared plumb. It was therefore deemed wise to examine this wall in detail; this was made possible by the fact that the columns which were encased by this wall, were surrounded by projecting pilasters. An examination of the pilasters was sufficient for the purposes of the Board. Results are given on next page.

COLUMNS.

Each column in the building was first examined with the transit instrument and then the results of this examination were verified by plummet observations, together with a close visual scrutiny. These results are shown in table No. 1.

It was impossible to make plummet observations of the whole tiers of columns from the roof to the first floor, except those around the light well. These were as is usual with all plummet observations, rather unsatisfactory on account of the oscillations of the plummet.

A general statement of these observations would be that the whole tiers were from one inch to two inches out of plumb and that the intermediate columns were on different sides of the plumb line. Tiers of columns, therefore, are in a sinuous condition, but the greatest deflection at any point in the whole tier would not be more than two inches.

GIRDERS AND BEAMS.

The girders and beams were also subjected to close scrutiny and a careful record made of each and every one. The record is shown on Tables No. 2 to No. 6, inclusive.

Every rivet on the building that was exposed was tapped and not one loose rivet was found.

All connections were also examined and were all found to be in good condition as far as could be determined, except those that are especially noted in the accompanying tables.

Pilaster	1st Floor.	2nd Floor.	3rd Floor.	4th Floor.	5th Floor.	6th Floor.	Roof
6		Sight	1″ N.	2″ N.	1½″ N.	½″ N.	2″ N.
7		Sight	Plumb	½″ N.	1½″ N.	2′ N.	3″ N.
8	Sight	1″ N.	Plumb	Plumb	½″ E.	Bulged 2½″ E.	down
9	Sight	1½″ N.	2¼″ S.E.	1′ S.E.	Bulged 2″ E.	Bulged E.	down
10		Sight	1½″ E.	Bulged 2″ E.	Bulged E.	Bulged E.	down
11	Sight	½″ E.	Plumb	Plumb	Plumb	Bulged ¾″ E.	down
12	Sight	Plumb	¾″ W.	Plumb	Plumb	Plumb	1″ E.
13			Sight	Plumb	Plumb	Plumb	3″ S.E.

TESTS OF MATERIALS.

To determine to what extent the steel had been injured by the fire and what beams could be safely straightened, three very badly twisted beams were selected and test pieces were cut out as close to the bend as could be gotten. It was surmised by your Board that the fire had not damaged the steel, that the store would act simply as an annealing furnace, and that the material would be improved rather than injured. The results of the tests justified the opinion of the Board. Regardless of how badly bent the sections were, the material was in no case injured. Results are given on next page.

After obtaining the data showing the condition of the individual pieces in the framework, your Board marked upon the floor plans of the building, which were obtained from the builders, those pieces which should be replaced with new materials and those which should be taken down, straightened and replaced. The accompanying Plates Nos. 7 to 13 will show this work, and will readily permit anyone so desiring to check the conclusions of the Board. An examination of these drawings will show that beams and columns having deflections or bends of $\frac{1}{2}$ inch or under, were not disturbed and were permitted to remain in the building, it being the opinion of the Board that the strength of this structure would not be reduced or jeopardised by so doing. It would not be just to ascribe the sinuosity of the various tiers of columns to the action of the fire alone, as possibly a small amount of it existed originally.

The fact of the south-west corner being two inches out of plumb was also a matter which presented no serious phase to the Board. While it no doubt was proof of the lateral movement of the structure westward, however, because the wall is firmly held by the steel framework, the Board was unanimous that there were no reasonable grounds that it should be disturbed. Had it been a

No. of Test.	Test piece cut from.	Per cent. Reduction	Per square inch.		Exten : °/ₒ	Fracture.
			Elastic Limit.	Maximum load.		
1	12in. Beam Web ...	43·8	34,830	58,300	26·25	Ang. Silky
1	,, Top Flange	53·8	41,340	58,850	25·75	,, ,,
1	,, Bot. ,,	48·5	43,010	62,470	28·75	½ cup ,,
2	,, Web ...	52·9	34,800	58,120	26·75	,, ,,
2	,, Top Flange	47·4	42,060	59,350	24·5	Irreg. ,,
2	,, Bot. ,,	63·4	38,160	58,190	27·5	Ang. ,,
3	10in. Beam Web ...	45·0	41,750	65,140	25·0	Irreg. ,,
3	,, Top Flange	49·3	39,500	59,260	23·75	Ang. ,,
3	,, Bot. ,,	44·7	40,230	60,100	25·00	,, ,,
4	4 × 4 × $\frac{5}{16}$ Angle...	19·5	39,650	52,600	15·0	Fibrous ,,
4	Ditto.	21·1	34,850	51,780	21·25	,,

brick wall depending upon its own weight for stability, a different decision would have been arrived at.

To do away with any error that may have crept in, the floor plans, as marked, were carefully examined at the building and checked.

With these drawings on hand it was but a simple matter to calculate the weights of the different classes of material to be furnished and work to be done. These being found, it was only necessary to apply the different values of the work to be done in order to arrive at a close determination of the damage done to the steel framework. The weights of the new materials required, together with the weights of the materials to be straightened, are shown on Table No. 7.

From this the following statement was deduced :—

DISMANTLING.

Scrap	50 tons.
Material to be straightened	236 ,,
Material necessary to be dismantled on account of removal of supports	124 ,,
Total ...	410 tons.
410 tons at 12·00 Dollars	4,920·00 Dols.
236 tons straightened and re-erecting at 18·00 Dols.	4,248·00 ,,

NEW MATERIAL.

					Dols.
274,936	lbs.	Punched I beams at	dols.	1·40 ...	3,849·00
21,684	,,	Rivetted girders at	,,	2·00 ...	433·68
73,900	,,	Punched T's at	,,	1·70 ...	1,258·30
9,160	,,	Truss work at	,,	3·50 ...	320·60
24,392	,,	Z columns at	,,	2·60 ...	634·00
5,370	,,	$\frac{3}{8}$-inch rods at	,,	2·60 ...	139·60
4,286	,,	$\frac{3}{4}$-inch tie rods at	,,	2·50 ...	107·15
					6,740·33

Erecting new material, 207 tons at 9·00 ...	1,863·00
Re-erecting 124 tons dismantled material at 9·00	1,116·00
Handling scrap, 107 tons at 4·00	428·00
	19,315·33
Less 157 tons scrap (207 tons less 25 °/。) at 5·00	785·00
	18,530·33

Having reported on the amount of damage done to the steel work, it remains for the Board to make its comments upon the lessons taught by the fire. Much pertinent matter could be dwelt upon and much has already been pointed out by the technical press. Not desiring to repeat what is already known, your Board will merely call attention to a few matters which have not been generally discussed and which in its opinion are especially noteworthy.

1st.—In buildings of about this height the distortion of the steel framework due to the heat of the fire, cannot in any instance be sufficient to work any serious damage; nor is it probable that at any time would connection rivets be sheared off. This conclusion is arrived at for the reason that there is no probability that any future fire will be fiercer than the one at issue.

2nd.—The method of fastening fire-proofing to the underside of beams with sheet iron strips should be discarded.

3rd.—It cannot be too often reiterated that open front buildings like this should be protected from external fires by metal shutters, and also that all shafts should be provided with metal doors which can be readily closed at all floors.

4th.—The most important lesson taught by this fire was the lack of strength developed by the fire-clay fireproofing. The building was permitted to move in any direction without any material restrictions by the fireproofing. The floor arches showed by the scaling off of the lower webs that they were unable to offer any sufficient force to counteract the tendency to lateral motion.

5th.—The column protection, although composed of the very best obtainable kind of fire-clay tile, was also not of sufficient strength.

In our opinion it would have been necessary to dismantle the whole steel framework had this structure been fourteen or fifteen storeys high. The leaning at that height at the same proportion as developed, would have entailed the necessity of taking the whole structure down.

Owing to the fact that steel columns or girders or beams after being subjected to a long-continued fire will assume the same temperature as fire proofing, and owing to the fact, furthermore, that the rate of expansion of the steel is much greater than that of the fire-clay tile, destructive movements are permitted which, as shown in this experience, will result in considerable damage, and which damage will increase in direct proportion to the height of the building.

In view of these important developments, it is our opinion that important structures of this class should have a radically different method of fire-proofing. The fire-proofing should be in itself strong and able to resist severe shocks, and should, if possible, be able to prevent the expansion of the steel work.

There seems to be but one material which is known that could be utilized to accomplish these results, and that is first class concrete. The fire-resisting qualities of properly-made concrete has been amply proven to be equal to, if not better than fire clay tile, as shown by the series of tests carried on by the building department of the City of New York.

From the experience gained in street railway construction in laying continuous rails, it is to a large degree possible to prevent the metal from expanding. In street railway work this has been accomplished merely by the adhesion of the pavement to the side of the rails. In building construction the same results could be obtained by encasing the columns and girders with concrete placed directly against the steel work. The adhesion of the concrete would to a large degree prevent unequal expansion of the concrete and steel. The floor arches should also be constructed of concrete, but of sufficient depth to be able to resist lateral forces. With the prevention of injurious expansion and the protection of columns with materials that can stand severe shocks of any nature whatever, the modern steel frame constructed building would be more thoroughly protected against any fire.

The construction herein suggested should not materially increase the cost of construction. The solid concrete about the columns would add strength to same and could no doubt be made self-supporting. The same could be said of concrete surrounding beams and girders, as has been amply demonstrated by the strength developed by concrete iron constructions such as the Monier and Melan arches.

One of the objections that would be raised against this construction would be that it could not be carried on in freezing weather. This is a proper objection, but there is no valid reason, in our opinion, why these structures should be built in winter any more than were the old-time brick structures.

As so-called fire-proof buildings are not equally and to the same degree protected against fire, we would recommend to the insurance companies that they should vary the rate of insurance for this class of building, depending upon the character of the fire-proofing used. The competition between fire-proofing companies has been so severe as to reduce the price of their output in very many instances at the expense of quality. The large fire loss in the Horne building would still have been larger had the fire-proofing been of poor quality; and we would further recommend that the insurance companies have prepared standard specifications governing the character of the fire-proofing and the construction and putting up of same, and requiring owners of buildings to use fire-proofing subject to these specifications under careful inspection, or be subjected to higher insurance rates.

Table No. 1

STATEMENT SHOWING CONDITION OF COLUMNS

Column Number	Basement	1st Floor	2nd Floor	3rd Floor	4th Floor	5th Floor	6th Floor
25	Partly exposed. Good	Top 3/8" SW. Straight Good	Covered	Covered	Covered	Covered	Covered
26	" " "	Top 3/8" SW. Bent 1/4" E Good	Partly exposed	Partly exposed	Partly exposed	"	"
27	Exposed. Good	Top 5/8" SW. Bent 1/4" E Good.	Top 1/2" W. Bent 5/8" N Good	Plumb. Straight Good	Top 3/8" W Straight Good	Top 1/2" W Straight Good	Bent.
28	" "	Partly exposed.	Top 3/4" NW. Bent 1/2" NW Good	Partly exposed Top 1/2" W	Plumb Straight Good	Covered	Scrap.
29	Partly exposed. Good	" "	Top 1/2" NW. Straight Good.	Top 1/2" W Straight Good	Top 1/4" NE Bent 1/2" SW	"	"
30	" " "	Covered.	Top 3/8" W. Bent 1/2" S Good	Plumb. Straight Good	Top 1/2" W Straight Good.	Top 1/4" W. Straight Good	"
31	" "	Top 1/2" SW. Bent 1/4" NW. Good	Covered	Covered.	Partly exposed	Covered	Top 1/2" NE New Con.
32	Covered	Covered.	"	"	Covered	"	Covered
33	"	"	"	"	"	"	"
34	Partly exposed. Good	Top 3/8" SW. Straight Good	Top 3/8" W Straight Good	Plumb. Straight Good	Plumb Straight Good	Top 1/2" NW. Straight Good	Top 1" NE. Bent
35	" " "	Top 3/8" W. Bent 1 1/2" S	Top 3/8" E Bent 1/2" S. Good	Top 1 3/8" E. Twisted 1/4"	Top 1/2" W Straight Good	Top 1/4" W. Straight Good	Scrap
36	" " "	Top 5/8" NE. Bent 1/2" S. Good	Top 5/8" NE. Bent 1/2" SE	Top 1/2" W Good	Scrap	Scrap	"
37	" " "	Top 1/2" NW. Bent 1/4" S. Good.	Top 1/2" NW. Bent 1" S. Good	Top 1" NE Bent badly	Gone	Gone	Gone.
38	" " "	Top 1/2" W. Bent 1/2" SE. Good.	Top 1/4" W. Straight Good	Plumb. Bent 1/4" W. Good	Top 1" W dents 1/2" Good	Top 1/2" W. Bent E 1/8" Good	Scrap
39	Covered.	Top 3/8" W. Bent 3/4" NW. Good.	Top 1/4" W " "	Top 1/4" E Straight Good	Plumb Straight Good.	Top 3/4" NW. Straight Good.	Top NE. Bent. --
40.	"	Covered	Covered	Covered.	Covered	Covered	Covered
41	"	"	"	"	"	"	"
42	"	Plumb Straight Good	"		Plumb Bent 1/2" S Good	"	"
43	Partly exposed. Good	Top 1/2" W. Bent 1/4" S. Good	"	Plumb Straight Good	1/2" W Bent 1/2" S Good	Top 1/4" S - Bent N 1/2" Good	Scrap
44	Exposed. Good	Top 1/2" NE Bent 1/4" E. Good	"	Top 1/2" NE Straight Good	Top 1/2" W Bent 1/2" S Good	Top 1" N Bent N 1/2" Good	Gone
45	" " "	Top 3/8" W. Straight Good	"	Covered	Slightly bent Good.	Covered	"
46	Partly exposed Good	Top 3/8" NE " "	"	Top 1/2" W. Straight Good	Plumb Straight Good	" "	Scrap
47	Covered.	Plumb Bent 1/4" S Good	"	Plumb. Straight Good	Plumb Bent 1/4" W Good	Top 1/4" W. Straight Good	Covered
48	"	Covered	" "	Covered	Covered	Covered	"

STATEMENT SHOWING CONDITION OF GIRDERS

Table No 2.

Girder Number	1st Floor	2nd Floor	3d Floor	4th Floor	5th Floor	6th Floor	Roof
E. Wall 1	Covered. Apparently OK	Covered. Apparently good	Covered. Apparently good	Covered. Apparently good	Covered. Apparently good	Covered. Apparently good	Gone
" 2	" " "	" " "	" " "	" " "	" " "	" " "	"
" 3	P. Probably bent	" Probably bent	" " "	" " "	Part Exp " "	Exposed Good	"
" 4	" " "	" " "	" " bent	Part Exp " bent	" " "	" "	"
" 5	" " "	" " "	" " good	Covered " good	" " "	" "	"
" 6	" Apparently good	" Apparently good	" " "	" " "	" " "	" "	"
" 7	" " "	" " "	" " "	" " "	" " "	Covered. Apparently good	Exposed. Good
W. Wall 1	" " "	" " "	" " "	" " "	Covered " "	" " "	" Deflection 1"
" 2	" " "	" " "	" " "	" " "	" " "	" " "	" " "
" 3	" " "	" " "	" " "	" " "	" " "	" " "	" " "
" 4	" " "	" " "	" " "	" " "	" " "	" " "	" " "
" 5	" " "	" " "	" " "	" " "	" " "	" " "	" " "
" 6	" " "	" " "	" " "	" " "	" " "	" " "	" " "
" 7	" " "	" " "	" " "	" " "	" " "	" " "	" " "
N. Wall 1	" " "	" " "	" " "	" " "	" " "	" " "	" Scrap
" 2	" " "	" " "	" " "	" " "	" " "	" " "	" "
" 3	" " "	" " "	" " "	" " "	" " "	" " "	Covered. Apparently good
" 4	" " "	" " "	" " "	" " "	" " "	" " "	" " "
" 5	" " "	" " "	" " "	" " "	" " "	" " "	" " "
A 1	Exposed. Con'l's removed	Exposed. Good	Exposed. Good	Exposed. Good	Exposed. Good	Exposed. Good	Exposed. Bent
" 2	" " "	" "	" "	" Bent W ½"	" "	" "	" "
" 3	" Bent E. Con'ls bent	" Bent E ½. Con'ls bent	" Sag ½" Con'l bent	" " W 1½" Con'ls bent	" Displaced Twisted	Gone	Gone
" 4	Part Exp. " "	" Sag ¼. Bent E ¼ " "	" " ½" " "	" " W 2½" Twisted	Gone	Gone	"
" 5	" Twisted "	" " ½ " E ½ " "	" Bent E ½" " bent	" Sag ½"	Exposed. Bent W 2"	Exposed. Scrap	"
" 6	Exposed. Bent W 1"	" Bent W ½ " good	" Good	" Bent E ½"	" Good	Exposed. Good	Exposed. Scrap
" 7	Part Exp. Apparently good	" Good	" "	" Good	" "	" "	" "

STATEMENT SHOWING CONDITION OF GIRDERS
Continued

Table No. 3

Girder Number	1st Floor	2nd Floor	3d Floor	4th Floor	5th Floor	6th Floor	Roof
B 1	Part Exp. Reverse Bend 1" Con. L's Removed 1 side	Part. Exp. Good	Part. Exp. Apparently good	Partly Exp. Apparently good	Part. Exp. Bent E ½"	Part Exp. Apparently good	Exposed Good
2	Part Exp. Good	" " "	" " " "	" " " "	" " Apparently good	" " " "	" "
3	" " 1 Beam bent E ½"	" " "	" " " "	" " " "	" " Con. L's bent	" " " "	" Scrap
4	" " 1 " " E ½, 1 W ½	" " Bent E ½"	" " Bent E ½"	" " Bent E ½" Twisted.	" " " " "	" " " "	Gone
5	" " Reverse bend	" " Top bent E ¼"	" " Apparently good	" " Apparently good	" " Apparently good	" " " "	Exposed "
6	" " " "	" " Bent E good	" " " "	" " " "	" " " "	" " " "	" "
7	" " Good	" " Good	" " " "	" " " "	" " " "	" " " "	Exposed Bent
C 1	" " Reverse bend ½"	" Apparently good	" " " "	Covered " "	Covered " "	Covered	" Good
2	" " " " 1"	" " " "	" " " "	" " " "	" " "	" " "	" "
3	" " " " ½"	" " " "	" " " "	" " "	" " "	" " "	" "
4	" " ⅜"	Covered " "	" " " "	" " "	" " "	" " "	" "
5	" " " ½"	Part Exp " "	" " " "	" " "	" " "	" " "	" "
6	" " ½"	Covered " "	" " " "	" " "	" " "	" " "	" "
7	" " Apparently good	" " "	" " " "	" " "	" " "	" " "	" "
D 1	" " Reverse bend ½"	" " "	" " " "	" " "	" " "	" " "	" "
2	" " " ½"	Part Exp " "	" " " "	" " "	" " "	" " "	" "
3	" " " " ½"	Covered " "	" " " "	" " "	" " "	" " "	" "
4	" " " " ½"	Part Exp " "	" " " "	" " "	" " "	" " "	" "
5	" " ½"	" " " "	" " " "	" " "	" " "	" " "	" "
6	" " " " ½"	" " " "	" " " "	" " "	" " "	" " "	" "
7	" " " " ½"	" " " "	" " " "	" " "	" " "	" " "	" "
B 7	" " Bent W 1½"						
a 7	" " Bent						

STATEMENT SHOWING CONDITION OF BEAMS

Table No. 4

Beam Number	1st Floor	2nd Floor	3d Floor	4th Floor	5th Floor	6th Floor	Roof
a. 1	Exposed Bent N3"	Exposed Bent N2" Twisted.	Exposed Bent	Exposed Bent N1"	Exposed Bent 1" N Twisted	Exposed Bent N1"	Displaced Scrap
" 2	" " N½"	" " S½"	" " ½" N	" " N½"	" " S½"	" " N½"	" "
" 3	" " N2"	" " N½"	" " N½" Sag ½"	" " N½"	" " S½"	" " N½"	" "
" 4	" Reverse bend ½" Sag ½	" " N½"	" " S¾"	" " N½"	" " S½"	" " S¾"	" "
" 5	" Bent S½"	" " N½"	" " S1½"	" " S½"	" Good	" " S¾"	" Bent
a₂ 1	" " N1"	" Reverse bend ½"	" " N½"	" " N½"	" Reverse bend ¼"	" " S¼ Twisted	" "
" 2	" Good	" Bent N½" Sag ½"	" " N½"	" " N½"	" Bent N½"	" Sag ½" "	" "
" 3	" Bent S1½" Sag ½"	" " N½"; " ½"	" " N½"	" " N½"	" " N½"	" Bent N½"	" Scrap
" 4	" Bowed up ¾"	" " S¾"	" " S½"	" " N½"	" " N½"	" " N½" "	" "
" 5	" " " 1½"	" Bent	" " S½"	" " N½"	Gone	" " N1"	Gone
a₃ 1	Covered by debris. Scrap	Gone	" Scrap	" Scrap	"	" Scrap	"
" 2	" " " "	"	Gone	Gone	"	Gone	"
" 3	" " " "	"	"	"	"	"	"
" 4	" " " "	"	"	"	"	"	"
" 5	" " " "	"	"	"	"	"	"
a₄ 1	" " " "	"	"	"	"	"	"
" 2	" " " "	Exposed. Bent	"	"	"	"	"
" 3	" " " "	Gone	"	"	"	"	"
" 4	" " " "	"	"	"	"	"	"
" 5	" " " "	"	"	"	"	"	"
" 6	" " " "	"	"	"	"	"	"
a₅ 1	" " " "	"	"	"	"	"	"
" 2	" " " "	"	"	"	"	"	"
" 3	" " " "	"	"	"	"	"	"
" 4	" " " "	"	"	Exposed. Scrap	"	"	"
" 5	" " " "	Exposed. Bent ¾" Reverse	Exp. Bent N¾" Sag ½"	" "	Exposed. Bent S3"	"	"

Table No. 5

STATEMENT SHOWING CONDITION OF BEAMS
Continued.

Beam Number	1st Floor	2nd Floor	3d. Floor	4th Floor	5th Floor	6th Floor	Roof
a6 1	Covered. Apparently good	Exposed Bent N1" Sag ½"	Exposed Good	Exposed. Bent 5¾" Sag 2½"	Exposed. Bent 5½"	Exposed. Scrap	Gone
" 2	" " "	" " N½"	" Bent 5½"	" " 5¾" " 2½"	" " 51"	" Sagged 3"	"
" 3	" Bent 5¾"	" " N½" " ½"	" " 5½ Sag ½"	" " 5½" " 1½"	" " 5½"	" " 1½"	"
" 4	" " 5¾"	" " N1½"	" Sagged ½"	" " 5¾" " 1"	" Good	" " 2½"	Displaced Scrap
" 5	" Apparently good		" Bent N½"	" " 5½" " 1½"	" Bent 51"	" " ½"	" "
a7 1		" Bowed up 3"	" " 5½" Sag ½"	" " 5½" " 1"	" Twisted	" " 1" Bent 5½"	" "
" 2		" " " 1" Bent 51	" " 5½"	" " 5½" " ½"	" Bent 5½"	" " ½"	" "
" 3	Covered Apparently good	" Good	" Good	" Sagged ½"	" " 5½"	" " 1½"	" "
" 4		" "	" Bent 5½"	" " ½"	" " N½"	" " 1½"	" "
" 5		" "	" " 5½"	" Bent N½" Sag ½"	" " N½"	" " 1½"	" "
" 6		" "	" Good	" Good	" Good	" Good	" "
b1 1		Gone	" Bent	" Bent N1"	" Bent Twisted	" Bent N1"	" "
" 2		Exposed. Scrap	" " N½"	" Good	" " 5½"	" Reverse bend ½"	" Bent
" 3	Removed. Bent. Good	" Good	" " 5½"	" Bent N½"	" " N½"	" " " ½"	" "
" 4		" Bowed up ¾"	" " N½"	" " 5½"	" Good	" " " ½"	" "
" 5		" Bent 5½"	" " 5½"	" " N½"	" Bent N½"	" " " ½"	" "
b2 1	Removed Good	" Good	" " 5½"	" Good	" " 5½"	" " " ½"	" "
" 2	Exposed. Bowed up ½" Bent 5½"	" "	" " N½" Sag ½"	" Bent 5½" Bowed up ¼"	" Good	" Good	" "
" 3	" Bent 51"	" Bent N½"	" Good	" " 5½" " ¼"	" Bent N½"	" Bent N½"	" Scrap
" 4	" " N¾"	" Good	" "	" " 5½"	" " N¾"	" Good	" "
" 5	" Bowed up ½"	" Bent 5½"	" "	" Good	" " N1" Twist	" Reverse bend ½" Twist	" "
b3 1	" Bent 5½"	" Good	" "	" Reverse bend ½" Sag ½"	" Scrap	Gone	" "
" 2	" Bowed up ½" "	" "	" "	" Bent 5½" " ½"	Gone	"	" "
" 3	" Good "	" "	" "	" " 5½" " 1"	"	"	" "
" 4	" Bent 5½"	" "	" "	" Scrap	"	"	" "
" 5	" Good	" Bent N½"	" "	" "	"	"	" "

STATEMENT SHOWING CONDITION OF BEAMS
Continued

Table No 6

Beam Number	1st Floor	2nd Floor	3d Floor	4th Floor	5th Floor	6th Floor	Roof
b_4 1	Exposed Bent N½"	Exposed Sagged ½"	Exposed Sagged ½"	Exposed Scrap	Gone	Gone	Gone
2	" Bent N½ Bowed up ½"	" " ½"	" Good	" "		"	"
3	" Bent N½"	" Scrap	"	"	"	"	"
4	" " N½"	" Good	" Sagged ½"	" "	"	"	"
5	" " N½"	" Bent 5¼ Bowed up ½"	" Bent 5½" Sag ½"	" "	"	"	"
b_5 1	" " 5½"	" " 5½" " 1"	" Bent 5½"	" "	Exposed Bent 51"	Exposed Sagged ¼"	"
2	" Bent 5½ Bowed up 1"	" Bent 5¼"	" " 5⅜"	" Good	" " N½"	" Bent N½" Sag ¾"	"
3	" Good	" " 5¼"	" " N½"	" Bent 5½" Sag ½"	" " 5½"	" Good	"
4	" Bent N½"	" Reverse bend ¾"	" " N½"	" " 5½" " ½"	" N½"	" "	"
5	" " N½"	" Sagged ½"	" " N½"	" 5½" " ½"	" Good	" "	"
b_6 1	" Reverse bend ½"	" Bent 5½"	" Good	" 5½" " ½"	" Sagged ⅝"	" "	"
2	" " " ½"	" Bowed up ½"	" Reverse bend ½"	" Bent N½"	" " ⅝"	" "	"
3	" " " ½" Sag ½"	" Bent 5½"	" Bent 5½"	" " N½"	" ⅝"	" "	"
4	" Good	" " 5½"	" Reverse bend ½"	" Good	" Bent 5½. Sag ⅝"	" Bent N½"	"
5	" Bent 5½"	" " 51"	" Bent N½" Bowed up ½"	" Bent 5½" Sag ½"	" " 5½" " ⅝"	" " N½"	Displaced Scrap
b_7 1	Covered. Apparently good	" Bent N½" Sag ½"	" Bent N½"	" Sagged ⅝"	" " 5½" " ½"	" Sagged ½"	" "
2	" " "	" Good	" Reverse bend ½" Sag ½"	" Bent N½" Sag ½"	" " 5½ " 1"	" Bent N¾" Sag ½"	" "
3	" " "	" Bent 5½" Sag ½"	" Bent 5½"	Bent N½"	" 5½" " ½"	" Sagged ½"	" "
4	" " "	" Good	" N½"	" " 5½"	" " N¼" " ⅜"	" " ½"	" "
5	" " "	" Bent 5½" Sag ½"	Scrap	" " N½"	" " 5¾"	" " ½"	" "
6	" " "	" Good	" Good	Covered. Apparently good	Covered. Apparently good	Covered. Apparently good	" Bent
Tier c	" " "	Covered. Apparently good	Covered. Apparently good	" "	" " "	" " "	Exposed. Good, except 5 in C-4 Scrap and 2 Bent
Tier d	" " "	" " "	" " "	" " "	" " "	" " "	Exposed Good
Tier e	" " "	" " "	" " "	" " "	" " "	" " "	" "
							Sag in Tiers c.d.e - ½"

Table No. 7

NEW MATERIAL REQUIRED

	Beams Punched I's	Girders Punched I's	Girders Rivetted	Tees	Truss Work	Columns	Suspension Rods	Tie Rods
Sixth Story and Roof	54768	26736		73900	9160	18138	5370	
Fifth Story	37756		16245			2316		854
Fourth "	35272		5439			3938		776
Third "	33042							793
Second "	24666							612
First "	22243							449
Basement and Sidewalk	32838							802
Mezzanine	4456	3132						
Totals	245041	29895	21684	73900	9160	24392	5370	4286

Sum Total = 413728# = 206.9 tons

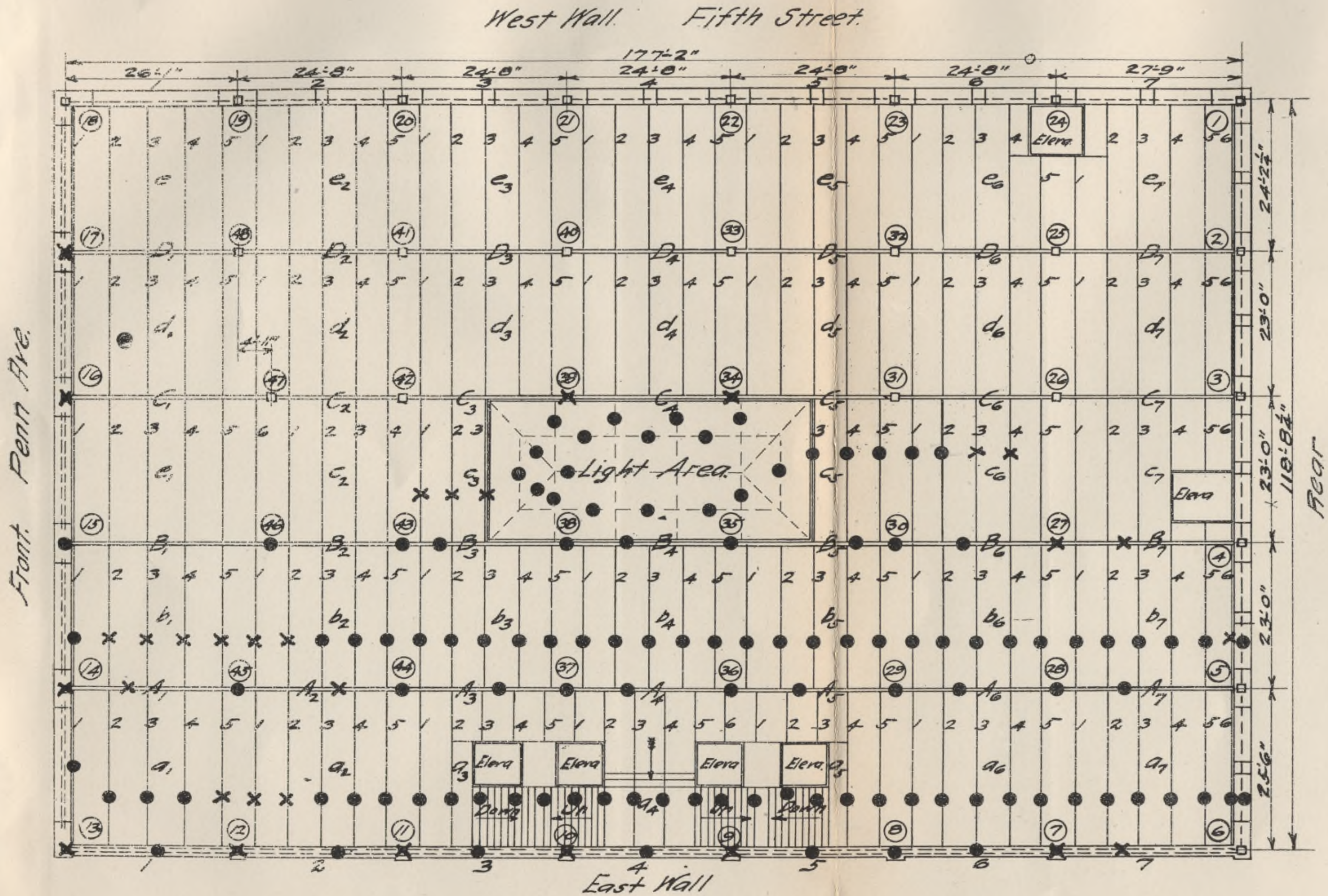
MATERIAL TO BE STRAIGHTENED AND RE-ERECTED

Note
The material for one story includes the columns for that story, and the beams and girders for the floor above.

	Beams Punched I's	Girders Punched I's	Girders Rivetted	Tees	Truss Work	Columns	Suspension Rods	Tie Rods
Sixth Story and Roof	8700	6800				9564		
Fifth Story	41772					12738		724
Fourth "	37763		10830			21862		802
Third "	28771		26680			13855		871.
Second "	19471		26228			27951		1104
First "	33889		36501			34806		1181
Basement and Sidewalk	30462	29622						733
Mezzanine	2742	4860						
Totals	203570	41282	100239			120776		5415

Sum Total - 471282# = 235.7 tons


Edwards

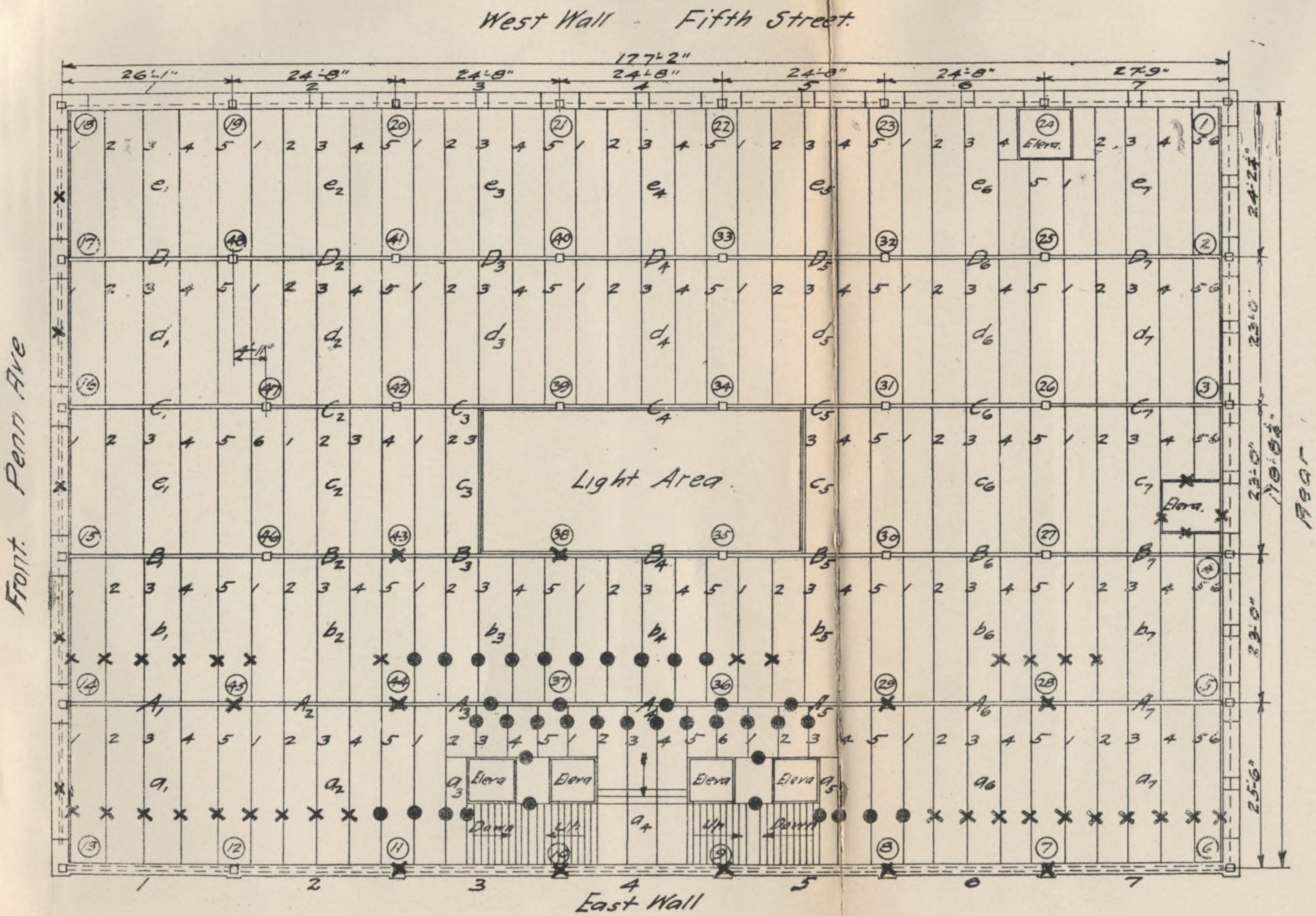


SIXTH STORY AND ROOF

PLATE No 7

● Indicates new material

× " material to be straightened

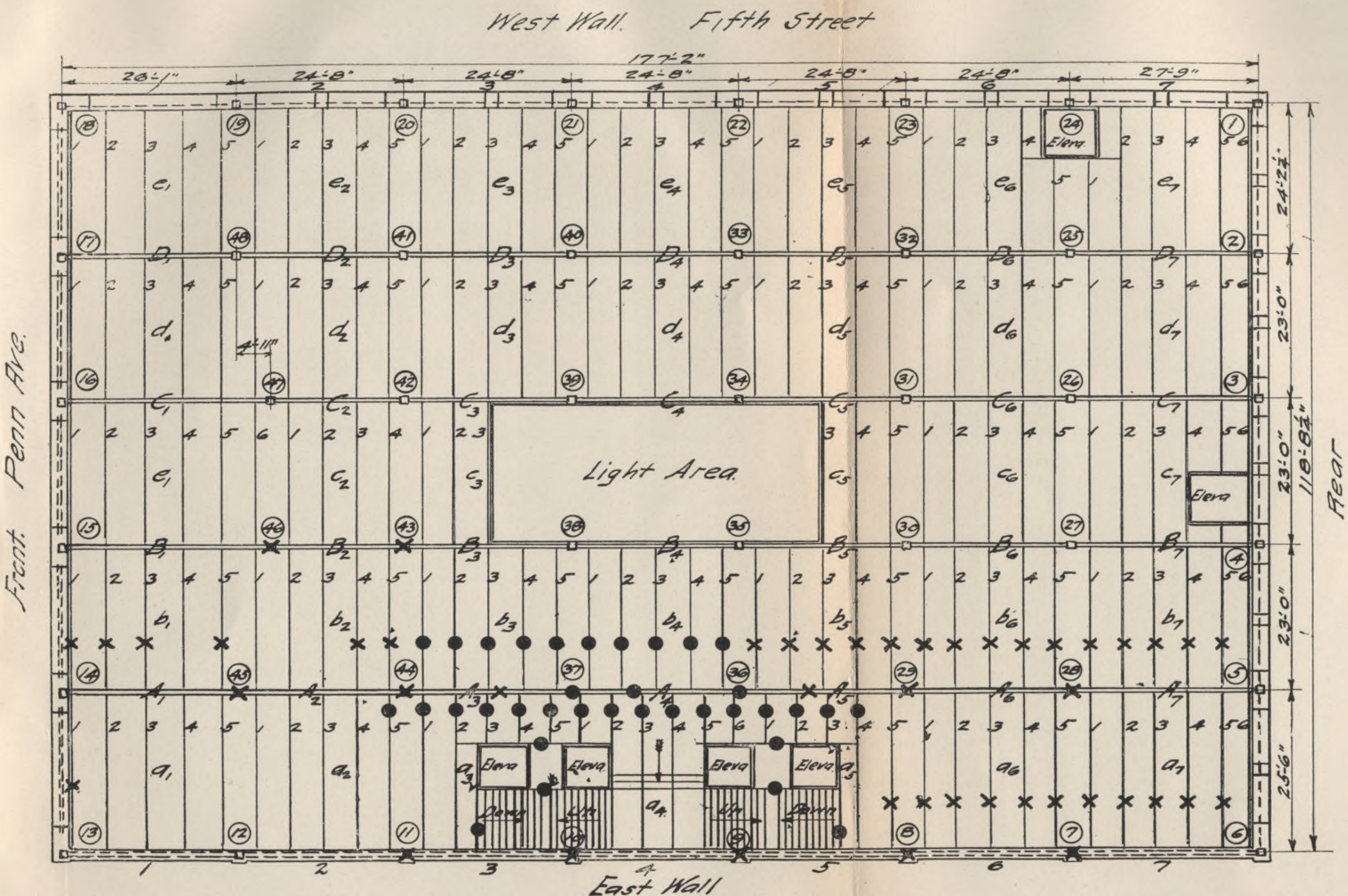


5TH STORY - 6TH FLOOR GIRDERS & BEAMS

PLATE No 8

● indicates new material

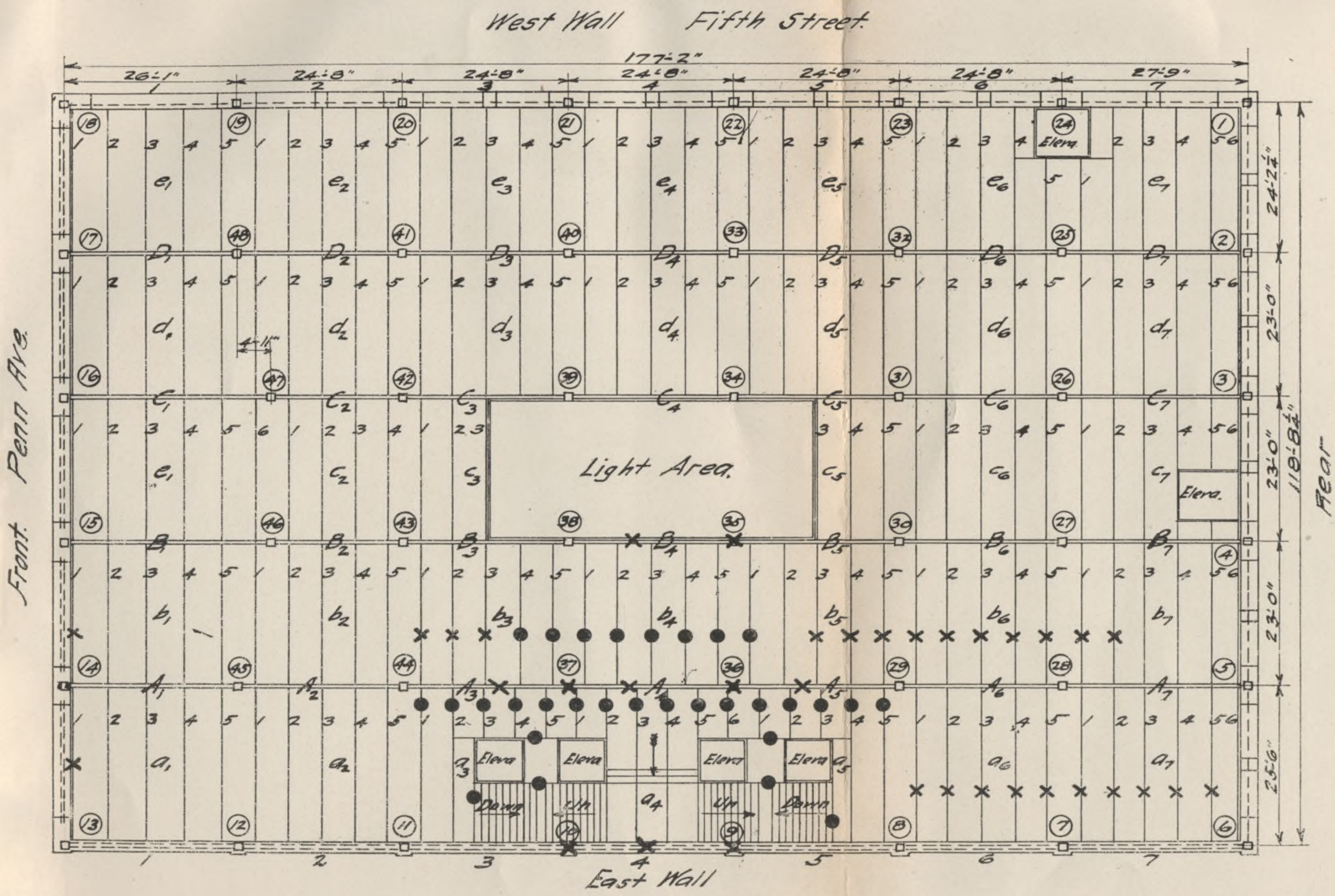
✕ " material to be straightened.



4TH STORY - 5TH FLOOR GIRDERS & BEAMS

PLATE No 9

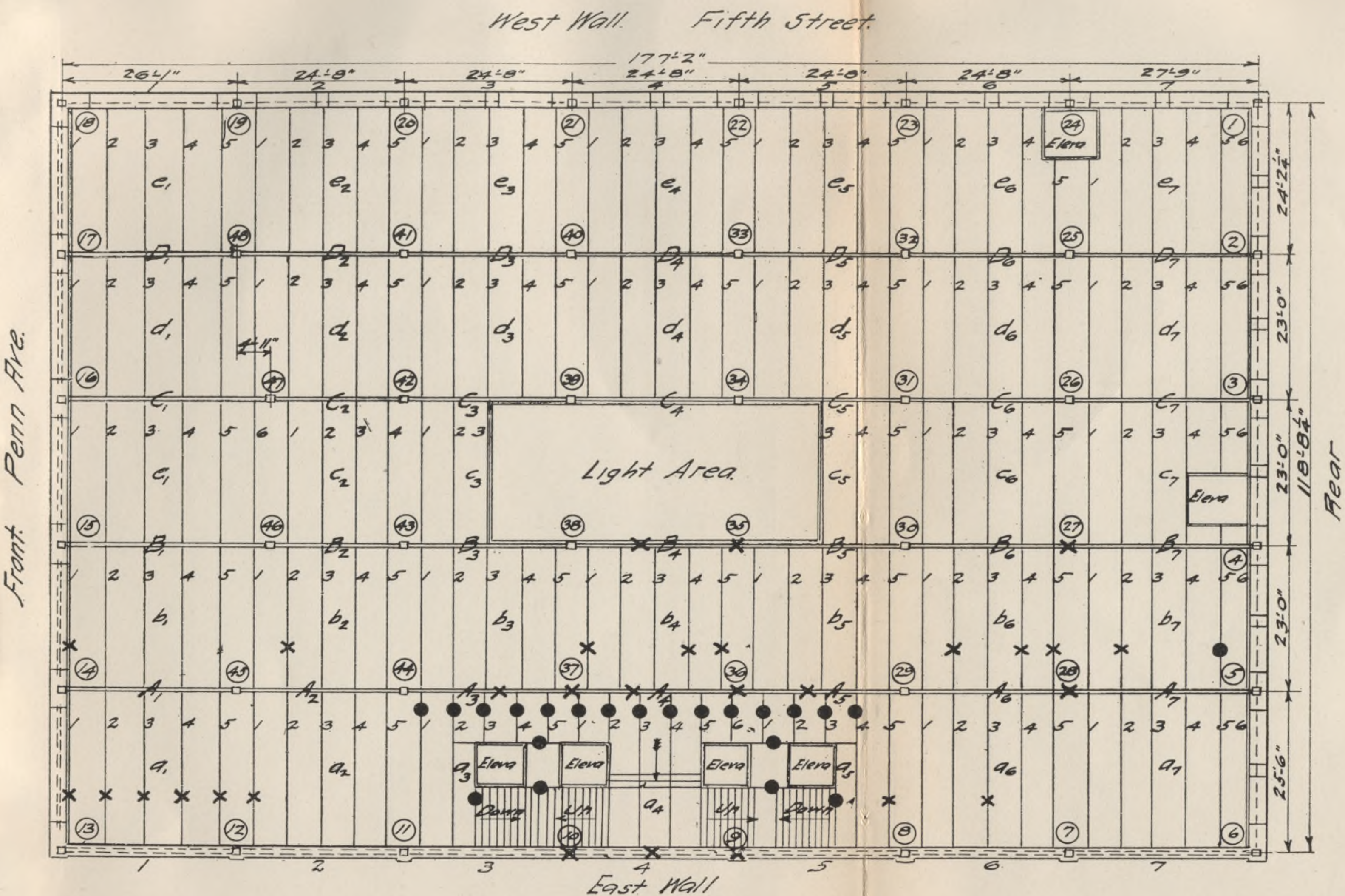
● Indicates new material
× material to be straightened



3RD STORY - 4TH FLOOR GIRDERS & BEAMS

PLATE No 10

● Indicates new material
× " material to be straightened

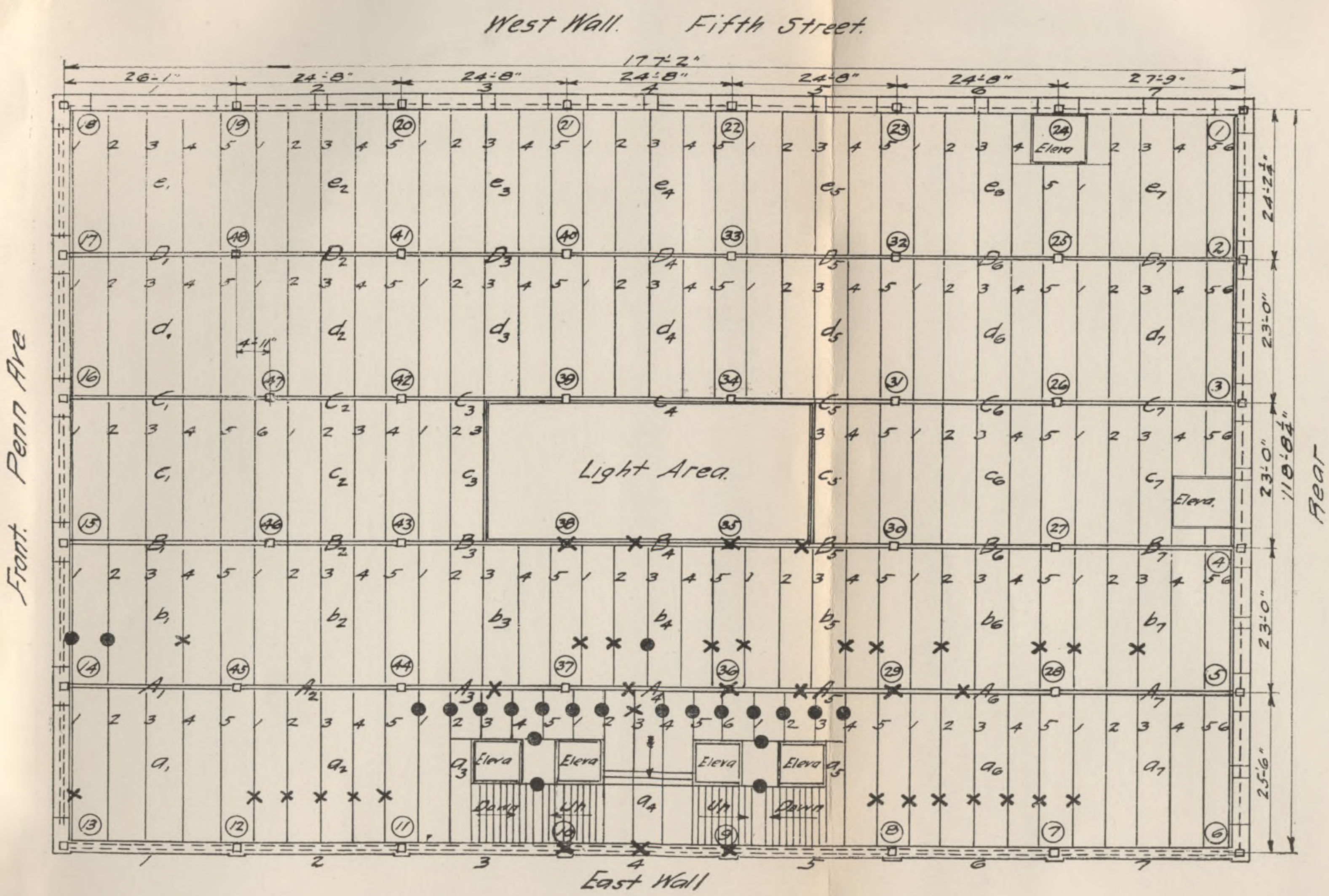


2ND STORY - 3RD FLOOR GIRDERS & BEAMS

PLATE NO 11

● Indicates new material

X " material to be straightened.

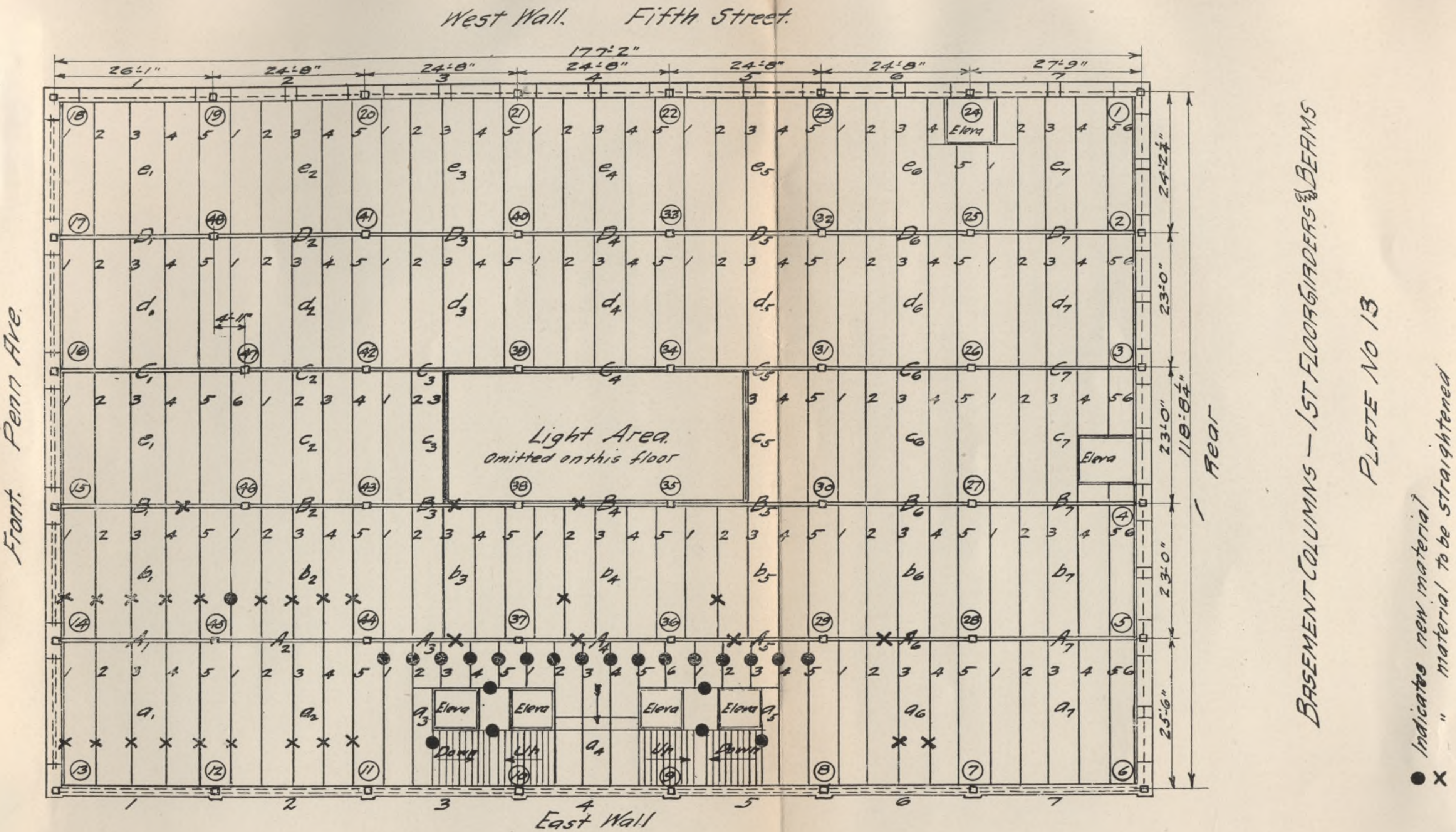


1ST STORY – 2ND FLOOR GIRDERS & BEAMS

PLATE NO 12

● Indicates new material

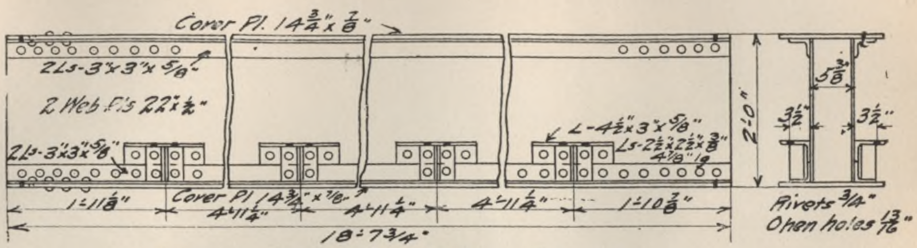
X " material to be straightened.



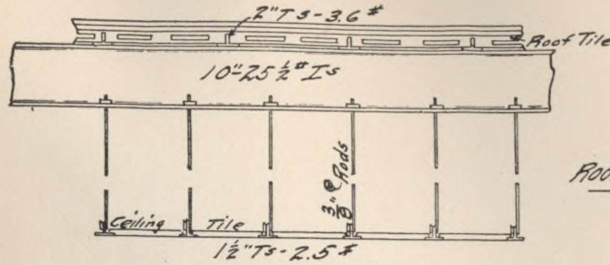
BASEMENT COLUMNS — 1ST FLOOR GIRDERS & BEAMS

PLATE No 13

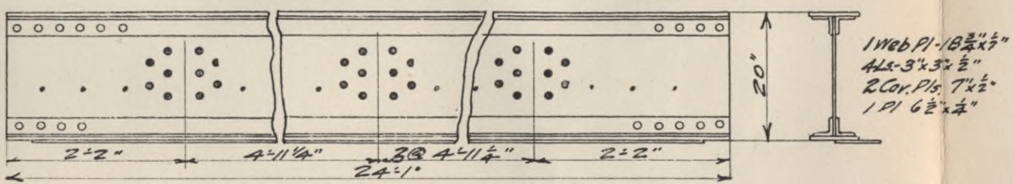
PLATE No. 14



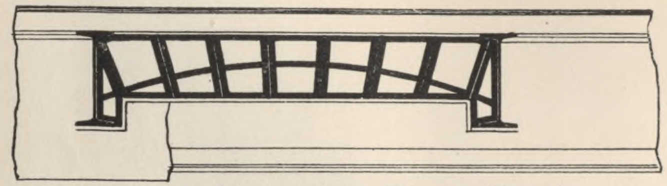
TYPICAL INTERIOR AND WALL GIRDER
TYPE IN E. WALL



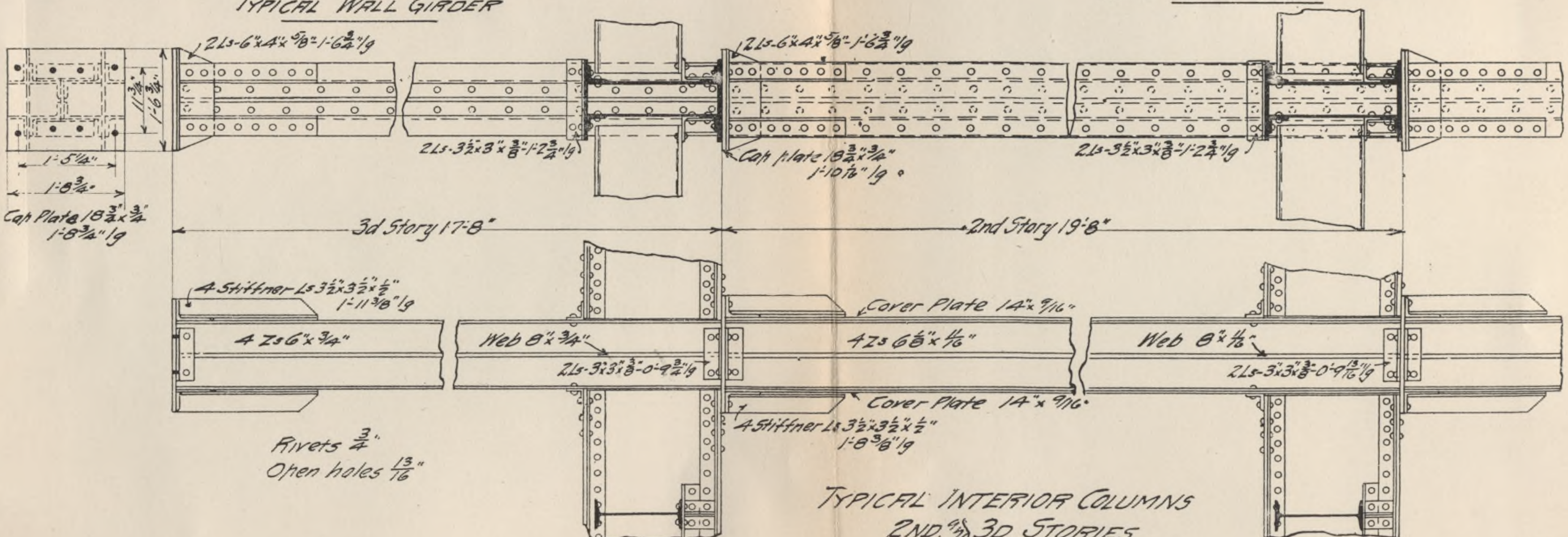
ROOF AND CEILING



TYPICAL WALL GIRDER



HARD TILE FLOOR ARCH



TYPICAL INTERIOR COLUMNS
2ND. AND 3D. STORIES

10,00