# IN THE CAUSE OF ARCHITECTURE

## BY FRANK LLOYD WRIGHT

## VIII. SHEET METAL AND A MODERN INSTANCE

THE MACHINE is at its best when rolling, cutting, stamping or folding whatever may be fed into it.

Mechanical movements are narrowly limited unless built up like the timer of a Corliss engine or like a linotype.

The movements easiest of all are rotary, next, the press or hammer, and the lift and slide works together with either or both. In these we have pretty much the powers of the "Brute." But infinite are the combinations and divisions of these powers until we have something very like a brain in action—the Robot itself, a relevant dramatic conception.

The consequences may well be terrifying when man's volition is added to these brute powers. This volition of man's, deprived of soul, may drive these powers to the limit of human endurance, yes—to the ultimate extinction of the humanity of the race.

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Commerce, as we have reason to know, has no soul.

Commercial interests left to themselves would soon write their own doom in the exploitation of their own social life. They would soon cease to reproduce. They would fail to reproduce because the elements of commerce are those of the machine—they lack the divine spark necessary for giving life. The margin of profit, piling up into residue, is inert, inept, impotent.

The Machine itself represents this margin of profit in the physical body of our modern world: a profit, inept, inert, impotent.

The question propounded in these papers and the continual haunting reference in all of them—"What is this interpreter of life, the Architect, going to do about it,"—is again insistent here. For in sheet metal there is opportunity to give life to something the Architect seems to despise while forced to use it because it is cheap. He avails himself of it as a degraded material. In the building trade, we find cornices, gutters, downspouts, water-sheds, in lead, zinc and tin, iron and copper, everywhere. Imitations too in these materials, of every other material, are everywhere.

But where may sheet metal be seen used as a fine material for its own sake?

Oh yes, occasionally. But why not "everywhere." It is the one "best thing" in modern economy of materials brought by the Machine. Building trades aside, we now make anything at all of sheet metal—kitchen utensils, furniture, automobiles and Pullman coaches. And in flashings and counter flashings or roofing it is keeping nearly all the citizens of America dry in their homes at the present moment.

Copper is easily king of this field and what is true of copper will be true also of the other metals in some degree, with certain special aptitudes and properties added or subtracted in the case of each.

Back of this sheet metal tribe, literally, we have the light rolled steel section for stiffening any particular sheet metal area in all particular cases whatsoever. All "spread" materials need reinforcement. Metal sheets no less than concrete slabs.

In the building trades we have had recourse to these metal fabrics in the cheapest and most insulting fashion, in buildings where the architect has either never been seen, or has been set aside. Sheet metal is prime makeshift to his highness the American jerry-builder.

Roofs seem to be the building problem





naturally solved by sheet metal, as it may be stamped into any desired form, lock seamed, and made into a light, decorative and permanent water-shed. It is possible to double the thicknesses in long panels or channels, sliding non-conducting material between them and lock-seaming together the continuous slabs thus made so that they lie together like planks on the roof framing, finished from below as from above. Each slab is a natural water channel.

The machinery at work in the sheet metal trades easily crimps, folds, trims and stamps sheets of metal as an ingenious child might his sheets of paper. The finished product may have the color brought up in surface treatment, or be enameled with other durable substances as in enamel color glazing or plating, or by galvanizing the finished work may be dipped and coated entire. But copper is the only sheet metal that has yet entered into architecture as a beautiful, permanent material. Its verdigris is always a great beauty in connection with stone or brick or wood, and copper is more nearly permanent than anything we have at hand as an architect's medium.

But now that all metals may be rolled into sheets and manipulated so cheaply—combinations of various metals may be made as any other combination of materials may be. And will be.

The Japanese sword-guard shows how delightful these properties of metal become when contrasted and harmonized in the hands of a master-artist. A collection of these mighty little things in art and craft should be the vade-mecum of every metal student or worker. In fact it seems that upon metals the Japanese, and before them the Chinese, have lavished much of their genius and have excelled from the making of a keen cutting-blade that would hold its edge against blows on steel to inventing subtle texture-treatments in iron for all decorative purposes.

Leaving the precious metals in a category by themselves, these sympathetic treatments of various humble metals are most significant for us who, as masters of metal production, are committed to it in our industries, though we have developed the beauty of it in use not at all.

In previous ages, beyond the roofer's use of lead in roofing and water-leads and the blacksmith's wrought-iron as seen in gates and lanterns, there has been little use made of metal by architects excepting such occasional use of bronze as Ghiberti made in his famous doors. But Ghiberti was a sculptor, not an architect, or his doors would, probably, have been wood elaborately ironed in the mode.

I believe the time is ready for a building of sheet copper wherein the copper may be appropriate carriage for glass only. What would such a building be good for and what would it be like?

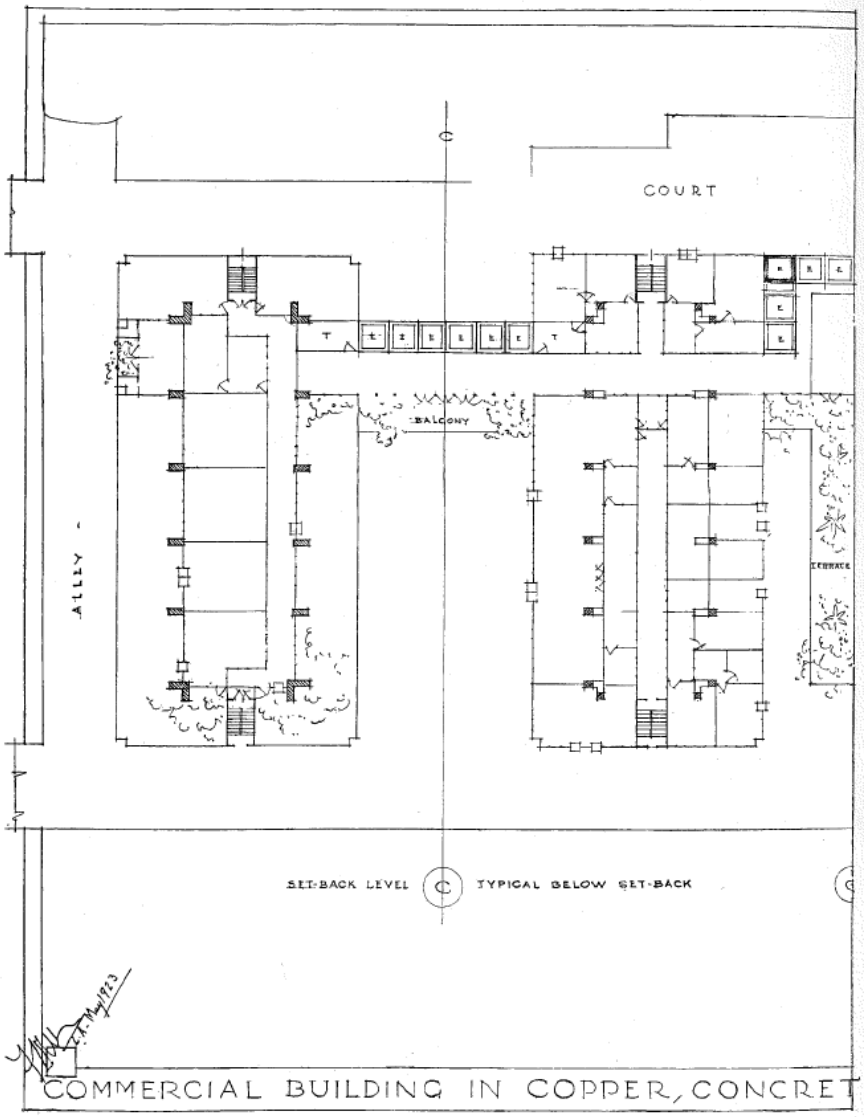
Why should we have such buildings? This architect will try to answer in his own fashion.

Since first meeting, thirty years ago, James A. Miller, a sheet-metal worker of Chicago, who had intelligent pride in his material and a sentiment concerning it (designing a house for himself at one time he demanded a tin-floored balcony outside his bedroom window in order that he might hear the rain patter upon it), I have had respect for his sheet-metal medium.

At that time I designed some sheet copper bowls, slender flower holders and such things, for him, and fell in love with sheet copper as a building material. I had always liked lead, despised tin, wondered about zinc, and revolted against galvanized iron as it was then used in Chicago quite generally as a substitute for granite.

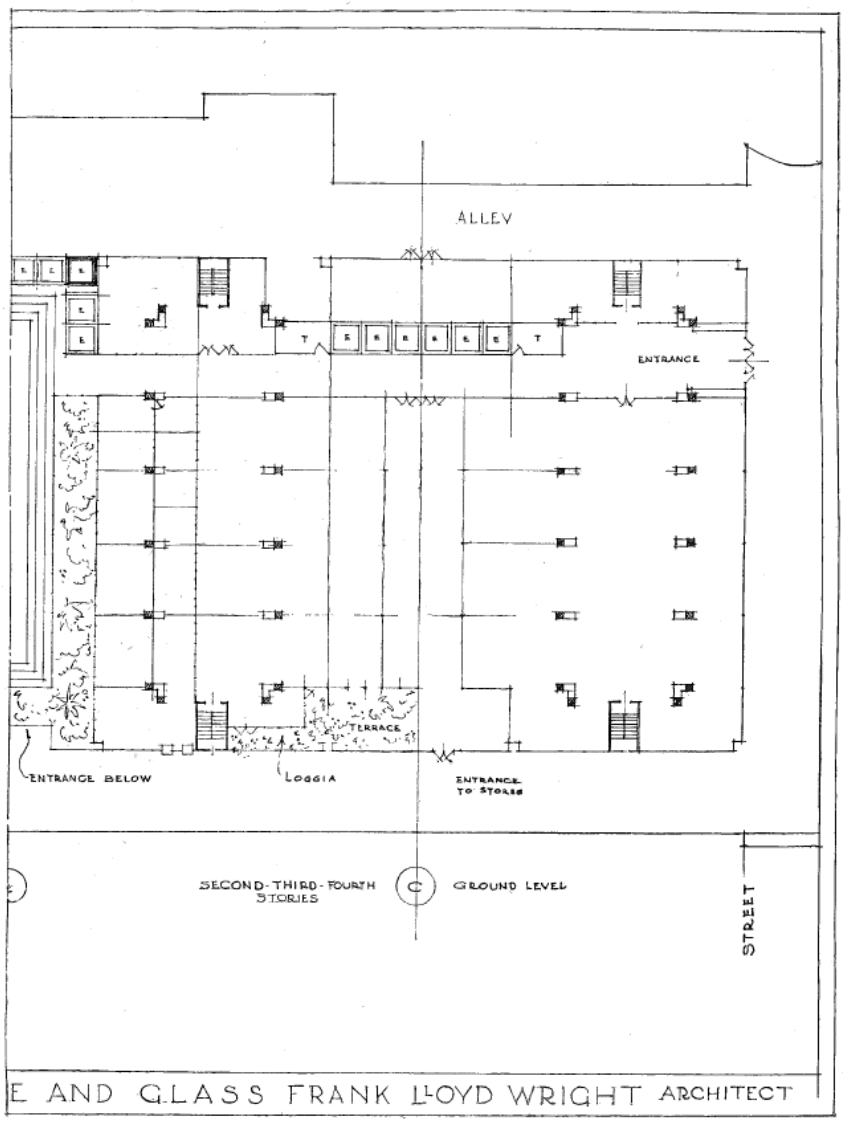
Miller Brothers in addition to other offices of that factory were then interested in sheet metal window-sash and frames—especially in skylights and metal doors.

We had contempt for them because they were made to imitate wooden sash. The doors too were made up in wood and covered with metal, the result being an imita-




COMMERCIAL BUILDING IN COPPER, CONCRET






E AND GLASS FRANK LLOYD WRIGHT ARCHITECT

tion in metal of a wood paneled door. It was usually "grained" to complete the ruse.

No one thought much about it one way or another. The city demanded these mongrels as fire-stops in certain places under certain conditions and that was that.

They were not cheap enough in those days—forcing the material as it was forced in this imitation work—to offer much incentive to bother with the problem.

But see how the matter has since grown up! We need no statistics to add to the evidence of our eyes wherever we go, which may see that what is left of the architectural framework of the modern world after concrete and steel have done with it will be in some form or other, sheet metal.

Twenty-seven years ago, under the auspices of Jane Addams, at Hull House, Chicago, an arts and crafts society was formed, and I then wanted to make a study of the Machine as a tool at work in modern materials. I invited Mr. Miller, Mr. Bagley, Mr. Wagner to come to the tentative meeting to represent respectively sheet metal, machined marble work and terra cotta. I wanted them there with us to tell us what we as artists might do to help them. At that time, to put the matter before the proposed society, I wrote (and read) the "Art and Craft of the Machine" since translated into many languages.

It was useless. As I look back upon it, I smile, because the society was made up of cultured, artistic people, encouraged by University of Chicago professors who were ardent disciples of Ruskin and Morris. What would they want to see, if they could see it in such a programme as mine?

It all came to nothing—then—although next day's Tribune, in an editorial, spoke of "the first word said, by an artist, for the Machine." I suspect Miss Addams of writing it herself. Ever since my stand taken there, however, the matter has grown for me, and, if not for them, it is all about them now in nearly everything they use or touch or see, still needing interpretation to-day as much as it was needed then.

But to get back from this reflection to this sheet-copper and glass building which has eventually resulted from it.

I have designed such a building.

It is properly a tall building.

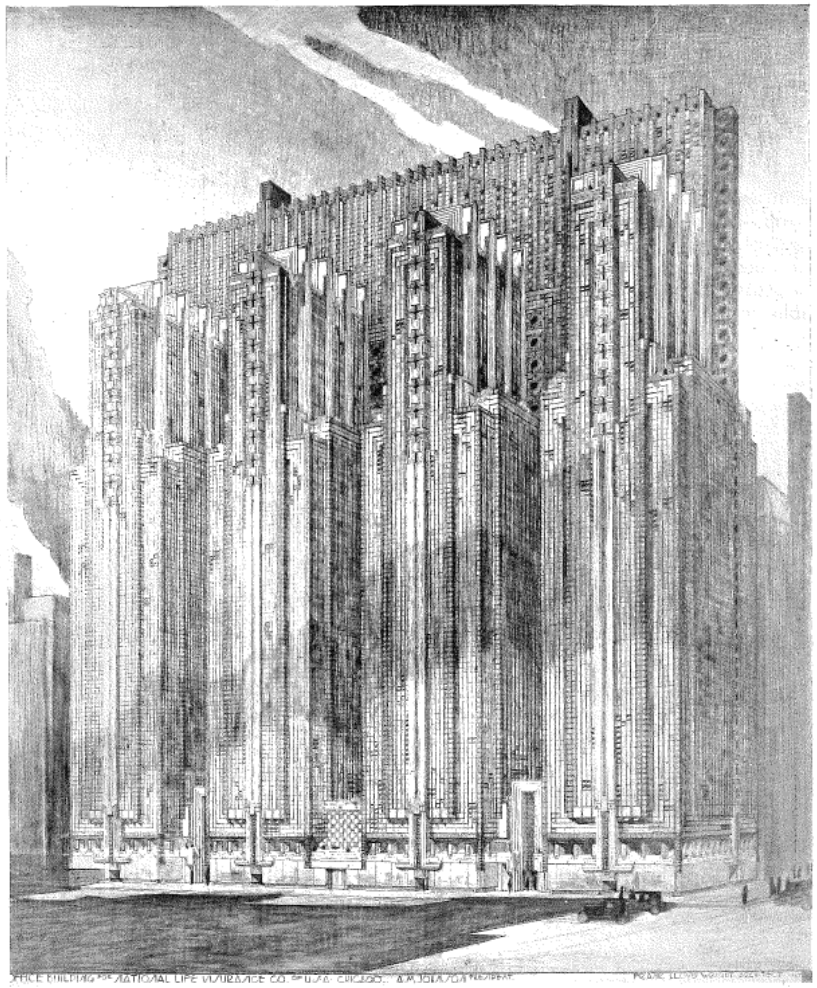
It is a practical solution of the skyscraper problem because the advantages offered by the material and method add up most heavily in their own favor where they can go farthest—either up or crosswise.

Standardization here may come completely into its own, for standardization is in the nature of both sheet-metal process and material. It may be again seen that the life of the imagination awakens its very limitations to life.

The exterior walls, as such, disappear—instead are suspended, standardized sheet-copper screens. The walls themselves cease to exist as either weight or thickness. Windows become in this fabrication a matter of a unit in the screen fabric, opening singly or in groups at the will of the occupant. All windows may be cleaned from the inside with neither bother nor risk. The vertical mullions (copper shells filled with non-conducting material), are large and strong enough only to carry from floor to floor and project much or little as shadow on the glass may or may not be wanted. Much projection enriches the shadow. Less projection dispels the shadows and brightens the interior. These protecting blades of copper act in the sun like the blades of a blind.

The unit of two feet both ways is, in this instance, emphasized on every alternate vertical with additional emphasis on every fifth. There is no emphasis on the horizontal units. The edge of the various floors being beveled to the same section as is used between the windows, it appears in the screen as such horizontal division occurring naturally on the two-foot unit lines. The floors themselves, however, do appear, at intervals, in the recessions of the screen in order to bring the concrete





A PRACTICAL SOLUTION OF THE SKYSCRAPER PROBLEM
FRANK LLOYD WRIGHT, ARCHITECT

structure itself into relief in relation to the screen as well as in connection with it. Thus the outer building surfaces become opalescent, iridescent copper-bound glass.

To avoid all interference with the fabrication of the light-giving exterior screen the supporting pylons are set back from the lot line, the floors carried by them thus becoming cantilever slabs. The extent of the cantilever is determined by the use for which the building is designed. These pylons are continuous through all floors and in this instance exposed as pylons at the top. They are enlarged to carry electrical, plumbing, and heating conduits, which branch from the shafts, not in the floor slabs, but into piping designed into visible fixtures extending beneath each ceiling to where the outlets are needed in the office arrangement. All electrical or plumbing appliances may thus be disconnected and relocated at short notice with no waste at all in time or material.

Being likewise fabricated on a perfect unit system, the interior partitions may all be made up in sections, complete with doors, ready to set in place and designed to match the general style of the outer wall screen.

These interior partition-units thus fabricated may be stored ready to use, and any changes to suit tenants made over night with no waste of time and material.

The increase of glass area over the usual skyscraper fenestration is only about ten per cent (the margin could be increased or diminished by expanding or contracting the copper members in which it is set), so the expense of heating is not materially increased. Inasmuch as the copper mullions are filled with insulating material and the window openings are tight, being mechanical units in a mechanical screen, this excess of glass is compensated.

The radiators are cast as a railing set in front of the lower glass unit of this outer screen wall, free enough to make cleaning easy.

The walls of the first two stories, or more, may be unobstructed glass—the dreams of the shop-keeper in this connection fully realized.

The connecting stairways necessary between floors are here arranged as a practical fire-escape forming the central feature, as may be seen at the front and rear of each section of the whole mass, and though cut off by fire-proof doors at each floor, the continuous stairway thus made discharges upon the sidewalk below without obstruction.

The construction of such a building as this would be at least one-third lighter than anything in the way of a tall building yet built—and three times stronger in any disturbance, the construction being balanced as the body on the legs, the walls hanging as the arms from the shoulders, the whole, heavy where weight insures stability.

But of chief value as I see it is the fact that the scheme as a whole would legitimately eliminate the matter of "architecture," that now vexes all such buildings, from field construction, all such elements of architecture "exterior" or interior becoming a complete shop-fabrication—assembled only in the field.

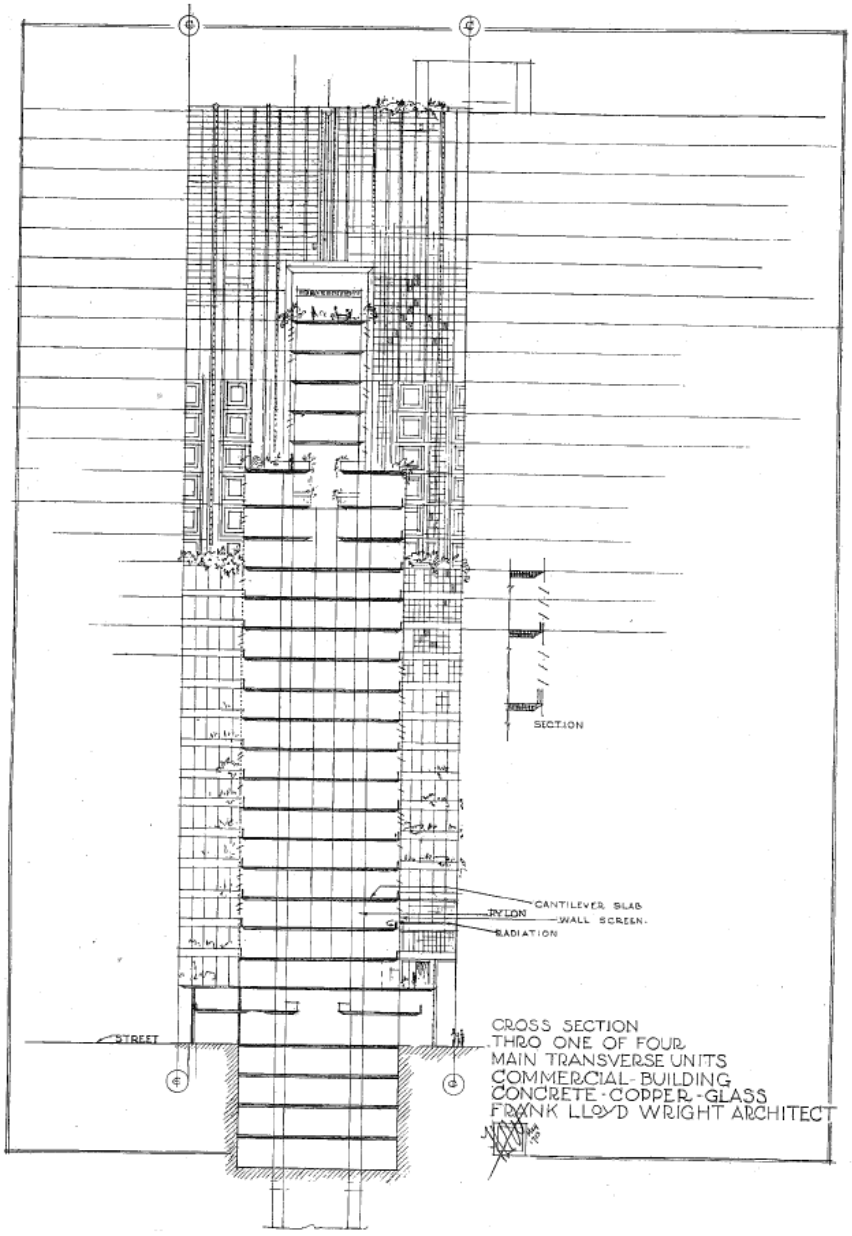
The shop in our mechanical era is ten to one, economically efficient over the field, and will always increase over the field in economy and craftsmanship.

The mere physical concrete construction of pylons and floors is here non-involved with any interior or exterior, is easily rendered indestructible, and is made entirely independent of anything hitherto mixed up with it in our country as "Architecture." In the skyscraper as practised at present the "Architecture" is expensively involved but is entirely irrelevant. But here it is entirely relevant but uninvolved.

Also the piping and conduits of all appurtenance-systems may be cut in the shop, the labor in the field reduced to assembling only, "fitting" or screwing up the joints being all that is necessary.

Thus we have, literally, a shop-made building all but the interior supporting posts and floors, which may be rein-






CROSS SECTION
THRO ONE OF FOUR
MAIN TRANSVERSE UNITS
COMMERCIAL-BUILDING
CONCRETE-COPPER-GLASS
FRANK LLOYD WRIGHT ARCHITECT

forced concrete or concrete-masked steel.

In this design, architecture has been frankly, profitably and *artistically* taken from the field to the factory—standardized as might be any mechanical thing whatsoever, from a penny-whistle to a piano.

There is no unsalable floor space in this building created "for effect," as may be observed.

There are no "*features*" manufactured "for effect."

There is nothing added to the whole merely for this desired "effect."

To gratify the landlord, his lot area is now salable to the very lot-line and on every floor, where ordinances do not interfere and demand that they be reduced in area as the building soars.

What architecture there is in evidence here is a light, trim, practical commercial fabric—every inch and pound of which is "in service." There is every reason why it should be beautiful. But it is best to say nothing about that, as things are now.

The present design was worked out for a lot three hundred feet by one hundred feet, the courts being open to the south.

There is nothing of importance to mention in the general disposition of the other necessary parts of the plan. All may be quite as customary.

My aim in this fabrication employing the cantilever system of construction which proved so effective in preserving the Imperial Hotel at Tokyo, was to achieve absolute scientific utility by means of the Machine—to accomplish—first of all—a true standardization which would not only serve as a basis for keeping the life of the building true as architecture, but enable me to project the whole, as an expression of a valuable principle involved, into a genuine living-architecture of the present.

I began work upon this study in Los Angeles in the winter of 1923 having had the main features of it in mind for many years. I had the good fortune to explain it in detail to "lieber-meister" Louis H. Sullivan, some months before he died.

Gratefully I remember—and proudly too—"I have had faith that it would come," he said. "This Architecture of Democracy—I see it in this building of yours, a genuine, beautiful thing. I knew what I was talking about all these years—you see. I never could have done this building myself, but I believe that, but for me, you could never have done it."

I am sure I should never have reached it, but for what he was and what he did.

This design is dedicated to him.