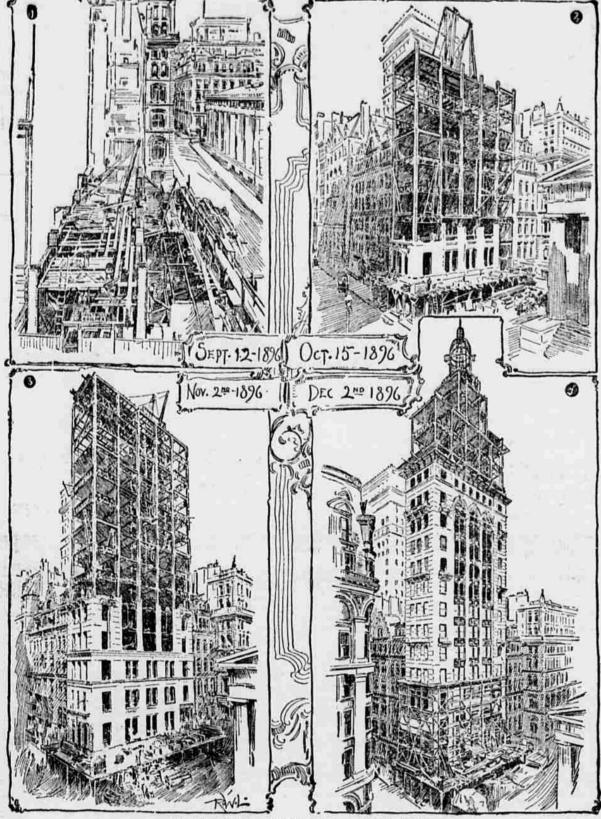
Feet in Width_Massive Foundations.

MODERN BUILDING METHODS

diving belt or bottomices box of steel or wood, underneath which the confined air prevents like weiter from rising up inside and enables men to work and evacuate a pit into which it gradually sinks far below water level to the required depth while the masonry pler is built on its top as fast as it descends. These three caselons were twenty-four feet long, twelve to fifteen feet wide and nine feet high, with solid timber walls two feet thick and roof three feet thick, covered inside and outside with smooth, heavy plank sheathing, all well builted and spiked, and the seams caulted airtight like a ship's bottom, with oakum and white lend. A heavy steel plate around the lend. tom, with cakum and white lend. A heavy steel plate around the bottom projected a few inches to form a sharp cutting edge. Air and water pipes and air shafts were carried vertically through the roof and the walls were extended above the roof by water-Air and water pipes and air shafts were red vertically through the roof and the walls were extended above the roof by water-light planking or cofferdams that formed an open well. When some of the pier masonry had been built on the caisson roof to the northwest corner of Wall and Nassau streets, New York, adds another conspicuous landmark to the marvelous construction that within half a dozen years has agruing up upon the lower end of Manhattan island. Although it is not the tallest of the modern office buildings, its design, construction and equipment is of the same class, its extremely narrow width made it much more slender in proportion than the tallest of them, increased the difficulties of design and the boldness of construction, and makes it a notable example of its class, affording a fair illustration of some of the most difficult and successful work that has been executed. First, some small steel pipes were sunk forly or fifty feet through the cellar floor into the ground. The difficulties of driving down such long and unwieldy tubes in such rows restricted quarters without disturbing the



CONSTRUCTION STAGES OF A SKY-SCHAPER.

low celling were overcome by driving suc- pressure, was not sufficient to be injurious weakens naked iron beams and columns un cessive short sections of pipe and screwing to the workmen, merely causing a consider-, til they fail or break, and cause the col-them together to form a single continuous able increase of temperature and producing lapse or destruction of the whole building. vertical pipe, whose penetration was aided, and samples of the soil brought up from different levels by the operation of a high-pressure water jet inside the pipe. The results indicated that the soil was composed of quicksand, earth and bowlders about fifty feet deep, saturated with water about twenty above a stratum of rocky hard pan

This subterranean exploration had been made to investigate the site upon which the tically twenty stories in height, was to be and for which it was necessary to adapted to its immense weight and the character of the soil. It was calculated that the finished building might develop a foundation pressure of about 10,000 pounds per square foot over the entire 1.852 feet of area of the building lot, and, as this was far more than the soil could safely support, the foundations had to be carried down to the solid hard pan, which was finally loaded to only 24 000 pounds per source foot alto only 24,000 pounds per square foot, al-though it had sustained pressures of 10,000 pounds per square inch without perceptible signs of yielding. Large and deep excava-tions were therefore required and they could not be made in the wet and treacherous ground even by the most careful and could ground, even by the most careful and costly methods, without danger of disturbing the yielding soil, so as to cause it to settle or flow, from under the walls of the tail and heavy buildings adjacent, so as to under-mine their foundations and jeopardize their mine their foundations and jeopardize their stability and the safety of their occupants.

responsibility rested upon the con tractors, who determined to avoid all risk by building, under the old foundations, col-umns extending down to the hard pan, and carrying the weight of the whole wall to that safe support. Narrow vertical slots were cut close together partly through the foot of the wall in its outside face, thin and short sections of very heavy steel pipe set upright in them, and forced down into the ground by powerful jacks on top, and hy-draulic jets inside that cut away the core like a chisel; as fast as one section of pipe s forced down another was screwed on its upper end, until at a depth of 40 or 50 feet the hard pan was encountered and could not be penetrated even by a pressure of 100 tons under which the steel pipe itself was compressed one-quarter inch only to expand again to its original length when the strain was removed.

STEEL FOUNDATION.

The interior of the pipe was then cleaned out and filled with concrete and brickwork built on it to the top of the slot, where pairs of steel wedges were driven in against steel cross beams embedded in the old masonry until they carried the full weight of the wall

This novel method of underpinning had never before been attempted except in the recent case of the Commercial Cable build-ing, where the columns were made large enough for men to enter under air pressure. and excavate the hard pan itself many feet

and excavate the hard pan itself many feet below water level.

The building lot was about 22 feet wide by 74 feet long and it was decided to cover over half of its entire area by three colid masoury piers, each to support four of the twelve columns that carry the superstructure. These piers were constructed by the pneu-matic enissen process and work was commatic caleson process and work was com-menced May 29, 1896, about two weeks after the underpinning was begun.

would have been necessary.

The caisson was entered through an air lock at the top of the shaft; this was a small steel chamber large enough to contain three or four men who entered it. They closed the airtight outer door and opened the pressure valve; when the required pressure was se-cured they opened the trap door in the bottom and descended the shaft into the excavating chamber of the caisson. To come out they entered the lock, closed the shaft door, opened the blow-off valve and when door, opened the blow-off valve and when the pressure was entirely relieved opened the outer door and emerged. It was neces-sary always to increase or diminish the pressure very slowly and both of the lock doors were never open at the same time; either one or the other was always closed and securely fastened by the force of the and securely fastened by the force of the

caisson pressure. When the calmon reached the hard pan the excavation was carried a short distance into it and the bottom leveled and cleaned Then concrete was lowered in buckets and rammed down till the whole interior of the calsson and the holes left by the pipes and shafts in the brick work were packed full. The pier was completed below the water level inside the cofferdam from which the water was pumped out, and on its iop steel beams and girders were set so re to overhing it in both directions and carry the column in the required positions at the extreme edges of the lot beyond where foundations could be conveniently placed. A solid mass of concrete was then filled in above the top of each pier, completely surrounding heart of a great block of artificial stone. last caise in was sunk July 25, and the first column was set September 3, and after the steel work was fully under way it rose magic at an average rate of two stories

every ten days. A GIGANTIC STEEL CAGE.

This building is of what is known as steel cage construction, that is, there is a steel framework or skeleton that is complete and independent of itself, carries its own weight, the floor loads, roof and all wind pressures and other stories, the whole being supported entirely by the columns and their braces which transmit the resulting pressure loads to the foundations. Instead of the floors and roof being partly carried by the walls, as formerly, the walls themselves are carried on special girders that are attached to the columns at every story, each supporting a zone or belt of masonry that merely serves as an ornamental screen to exclude the weather. Each column section was about thirty feet, or two stories long, the lower umns, girders, beams, braces and all other steel work was delivered on trucks and immedistely hoisted from the street, and set in the required position by two long derrick booms that were lifted from story to story as the work progressed and always operated by stationary hoisting engines set in the asement. The different pieces were first bolted together and the heavy splices and connections made by replacing the bolts with steel rivets driven red hot.

calsson process and work was comd May 29, 1896, about two weeks after
derpinning was begun.

SINKING THE CAISSON.

Beumatic calsson is essentially a great than is usually adopted for an unguyed

a sensation of obstruction in the ears, but if Even granite masonry, if exposed to water it had been necessary to sink the caissons and flames, will be destroyed, and so in the twice or three times as far great precautions best construction nearly all iron work is protected by some kind of brick work, con crete or terra cotta.

TALL AND LEAN.

The Gillender building is about 22x74 feet utside dimensions, and over 340 feet tall from the bottom of its foundatious to the from the first floor level to the cellar floor and above the first floor there are sixteen full stories above street level, and in the tower above two more stories, besides two small stories in the dome above the tower. thus making the total height of the apex of the structure about 310 feet to the bettom of the ironwork, while the main roof is a lit-The total estimated weight of the entire superstructure and floor loads is about 9,000 tons, and this, together with 226 tons of pressure developed by wind atrains, is trans mitted through the twelve columns and cencentrated upon the foundation piers at their feet. This weight is far more than enough to secure stability against the overturning effect produced by a wind pressure of nearly 500,000 pounds allowed for on one side of the building, but it required very stiff bracing and hundreds of tone of solid steel plates. and trussed girders were built into the walls between the columns for this purpose. Steel was used that would sustain a lord of 65,000 pounds per square inch and stretch 25 or 30 per cent beyond its original length before breaking, but in no case were the accurately calculated loads allowed to strain it more than one-fourth or one-fifth part of its ultimate strength.

The most noticeable feature of construc-tion was doubtless the skill and rapidity with which the trained erectors assembled the great steel girders and columns; although there were several thousand pieces and hundreds of them looked very much alike, each one was taken without hesitation, usually as soon as it arrived, rapidly and silently holated, perhaps 200 feet high, and set in its place, where half a dozen workmen would be waiting to securely bold it, and another party follow to drive the rivets, the men fearlessly walking and running on parrow, springing plank, or slender slippery beams, or swinging beavy sledges from precarious platforms as much as 300 feet high. Sometimes a workman would ride up on the stone or iron that was being hoisted from the end of the derrick boom, swaying sometimes he would slide down a rope or stand on a loose pulley block and let it descend by "overhauling" the tackle rope, yet such was their confidence and steadines that no serious accident of any kind occurreeither to the workmen or to the thousand f people passing beneath them in the streets iometimes, however, the men grow too reck men working on a narrow iron beam of an upper story of a high building came to blows, and one fell off and was miraculously caught in the loops of a rope many feet below, which saved his life. THE EQUIPMENT.

Steam for heating the building and operating its pumps is purchased from the New York Steam company, who develop it in great batteries of boilers several thousand feet away, bring it in great underground mains measure through special meters and thus

maximum pressure of 100 pounds per square A four-inch steel fire main extends from cellar to roof with branches in every corridor, having valves, fire hose and nozbeen lifelong members of the Congregational zies that will command every portion of the building and deluge it with water from the roof tank, while at the same time the mo-OUT OF THE ORDINARY. ment the valve is opened the decrease in pres-sure automatically turns steam into a large London has 15,000 policemen. fire pump and forces a powerful stream up from the bottom as well.

In Boston some of the tall buildings are

provided with an outside fire system also, which consists of a vertical pipe terminating at the roof level in a special nozzle from which a fan-shaped sheet of water can be thrown so as to fall in a thin curtain of water 120 feet wide, protecting the whole front or side of a building from an ad-

effects a valuable economy of space in dis-

feet per minute. A powerful steam pump raises water from the cellar to the 4,000-

gallon iron storage tanks 250 feet above

On May 1, 1896, the tenants were :emoved from the building that formerly oct this site and a few days before May 1 the new Gillender building received i tenants. The site of the building is valued \$750,000 and the cost of the building itself has been about \$500,000, including the cost of expensive machinery and equipment. markable figures, considering the difficulties ost of similar, though larger, buildings has een in the millions. It is no wonder that it has been predicted

that these gigantic towers will eventually transform broad and airy streets to the semblance of close, dark canyons that will finally become tunnels, when the enormously concentrated traffic is so congested that ele-vated platforms are required across the whole width of the street to provide secondmay, however, be reassured by the laws that passed in nearly all our large cities, regulating the g the maximum height of FRANK W. SKINNER. buildings.

If your face is pimpled or your skin blotched-purify your blood with Pill Ane-

THE OLD TIMERS.

"Uncle" Austin Gollaher, the only surviv ing playmate of Abraham Lincoln, is lying at the point of death at his home three miles east of Hodgenville, Ky. He is fit years of

Isaac McLellan, the aged poet-sportsman of Greenport, L. I., who recently celebrated his 91st birthday by playing whist all evening at his club, is troubled very little by his age and has his boats, fishing tackle and shooting implements always ready for use Dr. Charles Frederick Wuillgohs, the oldest physician in Ohio, still keeps up his practice, despite his 93 years and his name. He says every member of his family for the past 200 years has lived over 100 years, and his grandfather at the age of 106 cradled wheat for three days in succession. England's oldest duke, the duke of North-umberland, has entered his eighty-seventh year. Though he calls himself Percy, the duke is really a Smithson, the last male Percy having died in 1670. He is extremely religious and, as his wife was an Irving ite, one seat is always kept vacant at his table for the Savior.

Perhaps the oldest man in America, and

of the centenarians the most vigorous and well preserved. & Michael Shea of Indianapolis, Ind. In a few months he will have at tained the astonishing age of 116 years, and what is more remarkable, he continues in full possession of his mental facultice, tak

ing a keen interest in the events of the day. Physically he is well preserved.

The Rev. Walter Bartlett of Greene is the oldest minister in Ohlo. if not in the United States. During the slavery agitation he was one of the most prominen men in the state in the anti-slavery move ment. He was instrumental in promoting the election of Benjamin Wade to the sen-ate of the United States, and was a stockholder in the underground railway.

Thomas Thompson, the millionaire philanthropist, who left his fortune to his wife, with the provision that on her death one-half the income should go to poor women of Brattleboro. Vt., was graduated from Harvard college in 1817 in the class with the eminent historian, George Bancroft. His widow, who is now over 80 years old, is one of the most liberal givers of the day to charity and beneficial enterprises.

The last remaining grantdaughter of Alex

You will be asked by our agent to sign a trial order similar to the one below-Do not do so, however, until she has first shown you what-

Soap Polish

will do-You will then be convinced that it more than takes the place of anything you ever used for cleaning and p olishing purposes-



Mr. .. Cleland & Smith

.... Grocers 2008 Farnam Street.

Dear Sir:

This order will authorize you to send to my

house, No. ... South Tenth Street, 25 cents worth of Soap

Polish on the following conditions:

After have used one bar of said Spap Polish, if we do not find it equal or superior to anything of the kind ever used; we have the right to return the other two bars to you and you are to pay back the 25 cents. Yours truly,

..... H. Kountze

Fac Simile of Mr. Herman Kountze's Trial Order-

Soap Polish Cleans Anything

Takes out the dirt after all other remedies have apparently completed the work-Cleans pianos and all other fine furniture-varnished and painted woods and walls, tiling, mirrors, window glass, knives, clothing, etc., all without the sightest injury to the article cleaned. As it costs nothing to try it we expect your

LADY AGENTS WANTED-The T. T. Gibson S ap Co., 514 First National Bank Building, Omaha

&&&&&&&&&&&&&&&&&&&&&&

ander von Humboldt, Mathlide von Humbo dt, effects a valuable economy of space in dispensing with boilers, coal, etc.

An electric current is taken from the street conduits, and operates about 1,500 lamps besides driving the motors that run the passenger elevators that travel sixteen stories from pavement to roof in about thirty seconds at a maximum speed of 400 known as a friend of young artists of talent. Mr. and Mrs. Thomas W. Battles of Decatur, Ill., celebrated the sixtieth anniversary of their marriage last Tucaday. Thomas Batthe street mains, whence it is supplied to tles is a native of Mount Vernon, N. H. He wife was Miss Lucy Stevens, and she is jus one year younger than her husband. Both came from good old Puritan stock and have

> England has 4,000 building societies. More than 11,000,000 yards of tweed are used annually for clothing the male popula- in open-air meetings.

The city sealer of Pawtucket, R. I., has

notified all dealers that henceforth strawberries, and all other berries, must be sold by the quart, dry measure, and that crate boxes are barred.

cream, and the average daily product 10,000 pounds, or five tons, of butter. A baking company in Massachusetts claims

the exclusive right to wrap bread in paper and tie it with a pink string, and has appealed to the courts to restrain a rival com pany from doing it. Judge Advocate Samuel T. Shaylor, Jack

sonville, Fla., while sitting on a wharf dur-ing a court-martial recess, found in the hem of his treusers a diamond ring. He had purchased the trousers a year go, but had not had occasion before to use them. The Medical Record contains a study

1,704 severe cases of diphtheria treated by antitoxin, in which the mortality was 21.12 per cent. This reverses the figures of the period preceding the new treatment, when there was but 27 per cent of recoveries.

Farm houses in Carroll county, Maryland, are supplied with a telephone service at \$15 a year, and it is said by those who have tried it that life in the country is made far more attractive when instant communica tion can be had with the family doctor, the postoffice and village stores, to say nothing of an occasional chat with a distant friend. People are queer. A New York sparrow got hung by a piece of twine the other day and the street was filled with a crowd

watching eagerly to see the little creature freed from the place where it had caught in the eaves. Two men devoted themselves to its liberation. Yet not one of the spectators probably but joins daily in denouncing the whole sparrow tribe as unmitigated pests. The unique spectacle of four generations of the same family being together in church, each in a special capacity, is reported from Tockholes, England. The vicar performed the ceremony of christening a child named Henry Catterall, the child's father was offciating as organist, his grandfather joined in the musical service as chorister and his great-grandfather occupied a seat in the church warden's pew.

There is a sawmill in Grandin, Mo., many departments of which are in charge of women. There is a woman in charge of the engine. One of the rooms where the big saws are operated is managed by women. The lathe room is also populated with femi-ninity, and the machines of all sorts are handled by them. In the rooms adjoining force of young women is constantly employed filing and getting the saws in shape for work The care of the machinery is in their hands, and it is said they are quite as adept and as competent to handle it as any force yet em-

Weakness of Men



LABOR AND INDUSTRY.

Paterson, N. J., has a textile school, Maine will make silk from spruce trees. Machine-made diamonds are announced. The scouring mill at Pendleton, Ore., unning night and day. Co-operation in France has spread more in

agriculture than in manufacturing and trade. Ohio brickmakers are using a clay-digging machine that does the work of from eventeen to twenty men. The value of the cattle in western Amer ica is estimated at \$2,000,000,000, or five times

that of all the cattle in Australia. Nearly 33,000 tons of southern pig have been shipped to foreign countries dur ing the present month; 29,000 tons have been sent to the west, and 38,000 tons to the north

Joseph Woods, a vice president of the Cigarmakers' International union, is making a tour of the country in the interest of the union label, delivering illustrated lectures

A few years since there was not a canning factory west of the Alleghany tains, but now they dot the prairies and plan-tations of the Mississippi basin, and are in-creasing year by year at a rapid rate.

The Utah Federation of Labor is making The largest creamery in the world is said to be near St. Albans, Vt. Twelve thousand cows, owned by 700 farmers, supply it with law constitutional, but interested parties product le have carried the matter into the supreme The Bakers' International union at the

recent Cleveland convention adopted a new financial system similar somewhat to that of the cigarmakers, all moneys collected from regular sources being covered into the international treasury. The vote recently taken by the Brother-

hood of Locomotive Firemen to decide the question of affiliation of that organization with the American Federation of Labor resulted in an overwhelming majority voting in favor of the proposition. The commissioner of the public works de-

partment of Brooklyn and the chief engineer of the water supply department notified a pump company that hereafter it would have to pay the union rate on all city work. Machinists must be paid \$3.25 for eight hours.

In Connecticut there is hardly a farmer who does not raise tobacco. Tobacco is grown in at least a dozen states, Penn-sylvania leading in the amount of production, while Ohio has 50,000 acres given up to the culture, and an average crop of 30,-000,000 pounds.

The Board of Education of Wheeling, W. Va., has advertised for bids for the erection of an eight-room school building. An interesting feature of the advertisement is that portion that reads: "Bidders must state in their bids that only union labor state in their bids will be employed."

According to the Baltimore News, the farmers of Maryland are becoming interested in the movement for a general cultivation of tobacco and for the introduction of the raising of rice. In earlier days tobacco was grown throughout the state, but for the last half century it has been confined to the counties of southern Maryland.

Before any sickness comes a feeling of general debility and loss of vitality. Blood is vitality. When you feel weak was disease by strengthening your blood. Aneemic Pink is composed largely of con-centrated beef blood, and is the great blood builder.

Lutest. The latest is the fancy dress bloycle party.

Not on the boulevards or to some charming suburb, but indoors, preferably in a bicycle academy. In fact, the fancy dress ball that has so long held undisputed sway has found a rival. It used to be the way that what were known as "trick riders" were skillful with their wheels, but nowadays two-thirds of those who enjoy bicycle riding are suffi-ciently expert to maks their wheels do almost anything but talk. The bicycle ride mentioned is no theory, but an established fact. Not a week passes but what an event of the sort is greatly enjoyed.

The persons who take part in these af-

fairs do not, strange as it may seem, attire themselves in blcycle costumes. To be sure, their dresses and suits are not equal to those which were on view at the Bradley-Martin ball, but they are often very unique and always interesting. It seems very strange to think of Mary, Queen of Scots, riding a bike, or of Charles II. begging for her hand in the next bicycle reel, while Oliver Crom-well pedals off broken-hearted because some one has gained precedent. Yet this is exactly what happens. Then Napoleon Bona-parte and Britannia ride away in a circle around the room, the fastest of friends.

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We cure Catarrh, All Diseases of the Nose, Thront, Chest, Stomach Bowels and Liver; Hydrocele, Varicoccle. Syphilis, Gonorrhoea. NERVOUS DEBILITY And all its at. among YOUNG, MIDDLE AGED and OLD MEN.
BLOOD AND SKIN Discases, Seres, Spots,
Pimples, Strofula, Tumors, Tetter, Eczema and Blood Poison thoroughly cleansed from the system; also Weakness of
Organs, Inflammation, Ruptures, Piles, Fistula,
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CATARRH Throat, Lungs, Liver, Dyspepsia and all Bowel and Stomach LADIES Given careful and special attention for all their many allments.

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GREEN NO.

Louise of Prussia with the Czar Alexander love to scorch through the mazes of the lanciers, but perhaps this latter isn't so historically incorrect.