

5 LEAD 5



THE HUDSON RIVER BRIDGE, UNDER CONSTRUCTION, WILL HAVE THE LONGEST
SUSPENSION SPAN IN THE WORLD

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VOLUME I

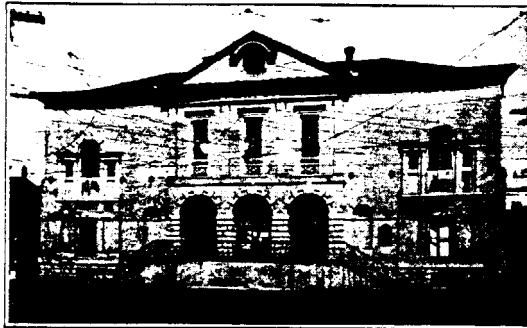
NUMBER 2



Many Uses for Lead in Historic Charleston

HISTORIC, quaint, and beautiful, the seaport of Charleston, S. C., lies on a peninsula at the junction of the broad Ashley and Cooper Rivers. Founded in 1670, this old southern city discovered the value of lead in various uses many years before the American nation was born. Charleston was among the first cities of this country to use lead pipe, and it continues to rely on lead for satisfactory service.

Since 1850 lead plumbing has been in use in Charleston, and ever since the formation of the

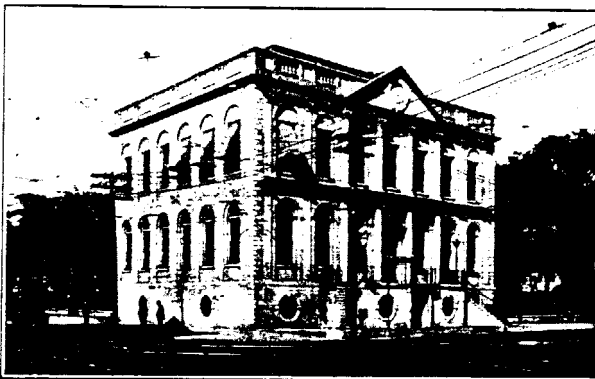


*Old Exchange Building, Erected in 1771
In 1774 the first independent government in America was set up here. The building later was British Headquarters during their occupation of Charleston in the Revolutionary War*

still remains. The Pringle House was built on order of Colonel Miles Brewton, Colonial Governor of Carolina. From 1780 to 1782 it was used as British headquarters, and during the War between the States, after the fall of Charleston, the Federal forces also made use of the famous house in similar manner. During both wars the citizens of Charleston stripped much of the lead and melted it to make bullets.

Though Charleston is one of the most historic spots and oldest cities in the country, and in and around it are preserved many of the old landmarks, it is modern in every sense. Cisterns, flickering gas street lights and cobblestone pavements, so often associated with it, have given way to expensive cement and asphalt streets, electricity has replaced the dim gas lights, and the former brackish water supply has been supplanted by a water department system with few equals.

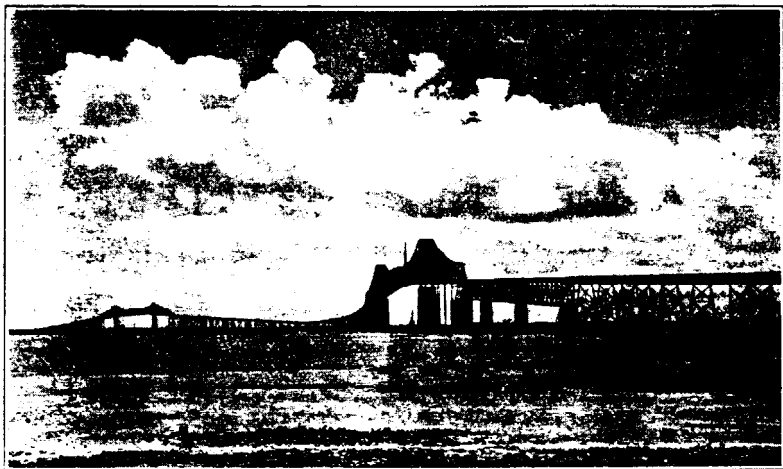
The famous resorts of the Isle of Palms and Sullivan's Island are only a few miles from the city and can now be reached over the magnificent new \$6,000,000 Cooper River Bridge. This mighty structure is periodically painted with red lead to protect it from the ravages of rust. Also near Charleston are Fort Sumter and Fort Moultrie, names familiar to every American, and the Charleston Navy Yard. In the harbor, each spring and fall, the United States



Charleston City Hall. Built in 1801 as the United States Bank, it now houses a priceless collection of historical relics, busts and paintings, including Trumbull's portrait of Washington

Water Department in 1880 that department of the city has used and continues to use lead. James E. Gibson, manager of the Water Department, states that "It is our practice to lay lead service pipe from the street main to the property line of the consumer. We find it to be probably the most satisfactory service pipe of all materials used."

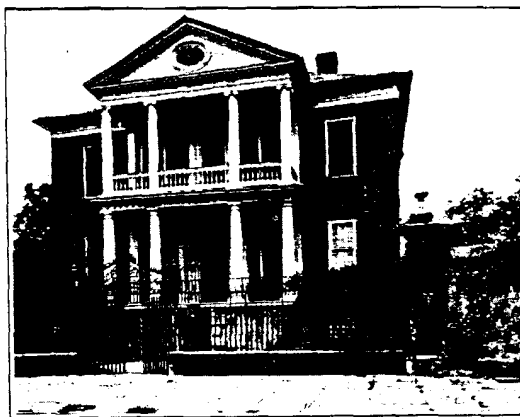
An early use of lead in Charleston was on the famous and beautiful old Pringle House on King Street near the Battery. Here, in 1765, when the house was built, lead sheets were used as flashing on the roof of the great porches to protect the walls and floor beneath from water leakage. Lead gutters also surrounded the slate roof. Much of the lead



The Cooper River Bridge, whose steel is periodically painted with red lead as a protection against the elements

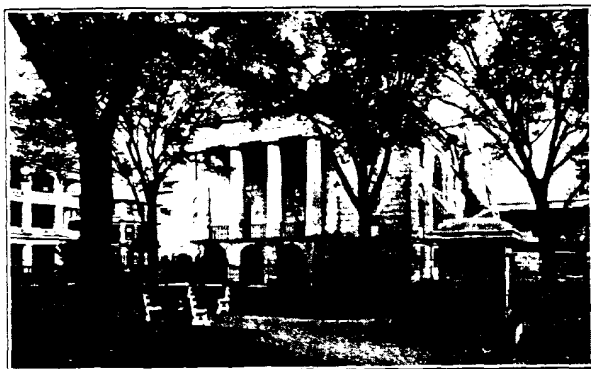
Navy Scouting Fleet Destroyer Squadrons are based.

Charleston was settled by a group of English settlers under grant by Charles II, whose name the city bears. Its population was later swelled by French Huguenots and Palatinate Germans, as well as settlers from the Bahamas and Bar-



The old Pringle House, in whose construction, in 1765, much lead was used and still remains

bados. The influence of these early settlers remains in customs and architecture. There are eighty churches in Charleston, ranging in age up to 220 years. Edward Rutledge and John C. Calhoun are buried in the churchyard of St. Philip's, originally completed in 1725.



Fireproof Building, built in 1825. So named because it was the first fireproof building erected in this country. It was designed by Robert Mills, later designer of the U. S. Treasury Building and Washington Monument.



Broad Street, Charleston, South Carolina, with the old Exchange Building at its foot, is one of the principal business streets in the city.

Lead Water-proofing in World's Tallest Bank Building

THE new Bank of Manhattan Building at 40 Wall Street, New York, is the world's third tallest building. The tip of its flag-pole is 927 ft. above the bottom of the narrow valley of Wall Street, while the top of the lead-coated copper roof crowning its 71 stories is 851 ft. above the street.

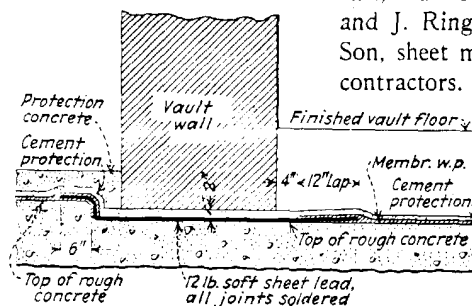


The Bank of Manhattan Building, Wall St., New York

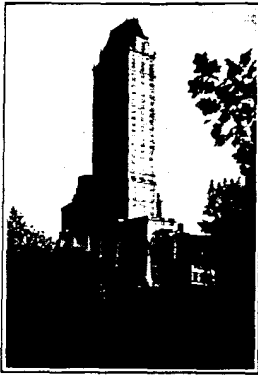
Far down in the basements of this skyscraper the great vaults of the bank are protected by the finest modern methods from all the agencies of destruction — burglarious attack, mob violence, earthquake, fire, and flood. The chances of moisture penetrating to these

vaults are extremely remote, for under the heavily reinforced concrete and steel vault walls are 30,000 lbs. of 12-lb. sheet lead waterproofing. Such waterproofing will not only withstand moisture indefinitely, but will successfully withstand the great weight of the vault walls resting upon it. H. Craig Severance, Inc., and Yasuo Matsui were the architects; Moran & Proctor, consulting engineers; Starrett Bros.,

Inc., builders; and J. Ringle & Son, sheet metal contractors.



New Hotel Pierre Has Used Lead Extensively



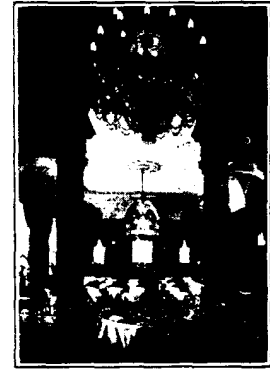
The Hotel Pierre, from Central Park, New York

MANY tons of lead have gone into the building of one of New York's newest and finest hotels. The new Hotel Pierre, rising more than forty stories above Fifth Avenue at Sixty-first Street, commands a magnificent view of Park and city. But should the occupants of its many large suites look within rather than without, their gaze

will be met by the exquisitely decorated walls of their rooms on which the Browning Painting Company has put, in paint, much white lead. In addition, the specially decorated public rooms have also largely relied on lead. The main dining-room, foyer, writing-room, and private dining-rooms, all are done with white lead by the White Allom Company. Cosmo de Salvo is responsible for the decoration of the large ball-room and its foyer and the terraced Club Pierrot on the top floor high above the city, while the

Phillipson Studios did the grill.

Lead sheet and pipe also play an important rôle, being used extensively in the plumbing system. As an illustration of the high grade of construction used in the building, lead was used in shower bath pans beneath the tiling. This application required more than 25,000 lbs. of sheet lead and insures the best possible protection against leaks and resultant costly damage. Water closet connections also consumed many pounds of pipe. In addition, caulking-lead was used wherever screwed joints were not practical. Jarcho Brothers were the plumbing contractors.



Georgian Dining-room, Hotel Pierre



In a private suite, Hotel Pierre

The architects for the Hotel Pierre were Schultze and Weaver, and the George A. Fuller Co. were general contractors. The interior decorations and furnishings were done under the direction of Myers, Minott & Co.

Lead Paints Protect Mighty Hudson River Span

THE longest suspension span in the world, the Hudson River Bridge, which is now being constructed by the Port of New York Authority from Washington Heights on the New York side of the river to Fort Lee on the Jersey side will rely on three forms of lead to protect it from corrosion. The 3500-foot suspended center span is nearly twice as long as the longest existing suspended span, that of the Ambassador Bridge at Detroit. It will hang 200 ft. above the water on four cables, 36 in. in diameter, suspended from gigantic towers at each end.

The structural steel of these towers, rising 600 ft. in the air, is painted with red lead to protect it

against rust and corrosion. The four 36-inch cables suspended from the towers will be encircled by cast steel bands at intervals, from which will be hung suspenders to support the roadway. The cables will then be wrapped with galvanized wire, which will terminate at each band in a recess. This recess will then be caulked with lead wool as a protection against corrosion, and the finished cable will be painted with red lead. For a finishing coat on the cables white lead paint will be used. Thus the Port of New York Authority takes no chances against the destructive action of rust upon its \$60,000,000 investment in this stupendous engineering project.

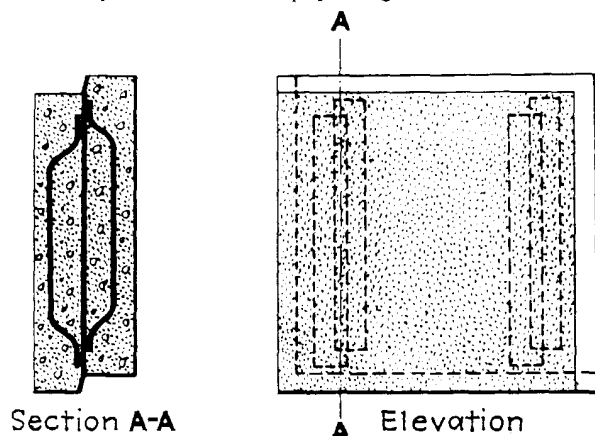


One of the huge 600-foot towers of the Hudson River Bridge, painted with red lead

Lead Performs Humanitarian Service in X-Ray Rooms

ABOUT 6500 pounds of sheet lead are used in the new addition to the Polyclinic Hospital in West Fiftieth Street, New York, for protection against X-rays. Lead is used for this purpose in the best modern hospital construction. It is a fine illustration of one more application where lead renders an invaluable service to mankind.

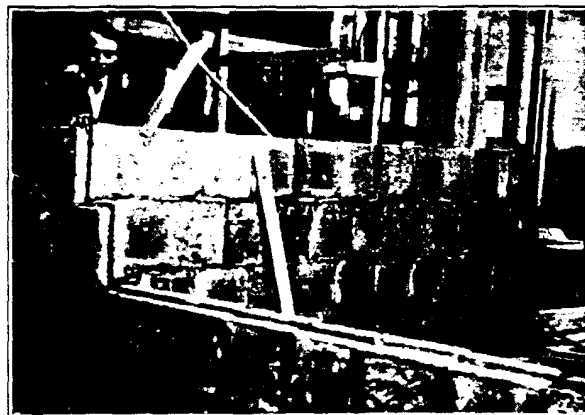
In the Polyclinic Hospital the deep therapy room in the basement and three X-ray rooms on the second floor of the new addition, as well as a room in the old building, have had their walls lined with sheet lead. This is necessary because, though the X-ray is one of the greatest agencies for good known to modern medical science, unless it is confined only to that locality in which it is needed, it may be extremely harmful in its physiological effect. Lead is



Details of concrete blocks with sheet lead held in center by lead straps

the most effective material for stopping the passage of these rays. Therefore, walls and floors of X-ray rooms must be protected by lead to prevent the rays from having any ill effect on the occupants of neighboring rooms. Glass windows in X-ray rooms must be made of very high lead-content glass, and the operators must wear rubber clothing containing a high percentage of lead.

In the Polyclinic installation the walls of the X-ray rooms are built of concrete blocks containing sheet lead at their center. These blocks are a foot square by four inches thick and the lead is $\frac{1}{8}$ in. thick. The two halves of the block containing an unpierced sheet of lead between them are set two inches off center, as shown in the illustration, so that, when the wall is built up, the blocks, and consequently the



*Erecting X-ray room walls in Polyclinic Hospital, New York
Wythe & King and William S. Gregory, Architects*

lead, will overlap. In this way there is absolutely no space left in the wall unprotected by lead where rays might penetrate. As X-rays will penetrate even the smallest unleaded space, no nail-holes or other apertures may be left uncovered. The sheet lead is held in the blocks in such a manner that it is not punctured, and this, combined with the overlapping of the blocks, gives the equivalent of a continuous, unbroken, sheet-lead wall. Sheets of lead are also used in the floors under the X-ray machines.

Fred T. Ley & Company were the general contractors, and the blocks are a product of David H. Barry, Inc., of Brooklyn, N. Y.



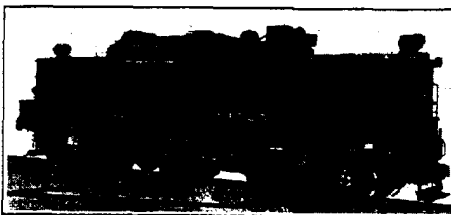
Hotel Bellingham, Bellingham, Wash., painted throughout with white lead and oil

"Three-Power" Locomotives Use Lead Storage Batteries

"THREE-POWER" is the term applied to the new style of switching locomotives powered by storage batteries, oil engine and third rail or trolley. These locomotives may be operated either on the third rail or trolley, on the engine and battery combined, or on the battery alone. They can be used wherever there are rails, making them the most flexible and useful type of locomotive now in existence.

As a result of more than two years' experience with a storage-battery, oil-electric locomotive, the first of its kind, in its Seventy-second Street yards in New York City, the New York Central has recently ordered forty-one of these new units. Thirty-five are for its own use, and four for use on the Michigan Central. Two have been purchased for passenger switching service in the LaSalle Street Station, Chicago. The Rock Island has ordered a similar locomotive for use at the LaSalle Street Station, and the Lackawanna has ordered two for its Jersey City yards.

The battery for the New York Central type locomotives is of the lead-acid type, having 240 cells and is rated at 650 ampere-hours. It is arranged in four completely enclosed compartments with two tiers of cells in each compartment. The entire locomotive weighs 255,000 lbs., can exert a tractive effort of 33,800 lbs. for one hour, and 24,600 lbs. continuously. It exerts a maximum tractive force for starting of 64,000 lbs. A 300-h.p. oil engine operates a generator which either supplies power to the four electric motors or, if operating at less than full load, charges the battery. If additional power is necessary, both the engine-generator set and the storage battery supply it. The Lacka-



COURTESY N. Y. CENTRAL R. R.
No. 1525, original "three-power" locomotive
and predecessor of the newest type
shown below

wanna locomotives use 360-cell lead batteries.

The advantages of this type of locomotive are numerous. Where there is no third rail or trolley supply, it can be operated on engine or battery, thus saving much expense in the installation of third rails in yards and other places where they are not desirable. Great power for starting heavy loads is available

by the use of two sources of power at once, which also makes rapid acceleration possible, speeding up switching. The operation of the engine-generator set in multiple with the battery allows the oil engine to operate at a constant speed, doing useful work all the time, either providing motive power or charging the battery. The locomotive can be used twenty-four hours a day without time out for charging, and, operating on the battery alone, it can be used inside of buildings such as warehouses and in tunnels without operating the engine.

This is but another advance in the application of lead storage batteries in the transportation field. As far back as 1882, shortly after the development of pasted plates, the Pennsylvania Railroad first used storage batteries for passenger car lighting, an application which has reached a high state of perfection in the modern Pullman car and coach. In 1904 the same railroad purchased the first electric industrial truck. Today these economical storage-battery propelled trucks are used for materials handling in almost every kind of industry. Great fleets of electric street trucks deliver baggage and express in all of America's large cities. Reliable power is provided for the operation of railroad signals and also for mine and industrial locomotives by lead storage-batteries.



COURTESY GENERAL ELECTRIC CO.
Three of the newest storage-battery, oil-electric locomotives, and (above)
one with sides removed, showing battery compartments at each end

Hard Lead Spandrels Aid in Beautifying New Club Building

THE Downtown Athletic Club Building is one of the most recent additions to the renowned skyline of lower Manhattan. This slender, graceful 35-story structure, which is devoted entirely to the activities of the club, has just been completed. The exterior beauty of the building is greatly enhanced by the use of ornamental hard lead spandrels.

More than 400 of these hard lead spandrels replace the face brick below the windows. They are formed from 4-lb. hard lead sheets and vary in size, the majority being 52 in. square. In the construction of spandrels, metal has come into popular use. On account of its malleability and ease of working, hard lead is particularly adapted for use in the spandrel. Among other things, it permits of a broad, heavy, rigorous treatment where emphasis is desired, while still retaining gracefulness of line. When exposed, hard lead takes on a soft gray patina which tends to bring the figured plate into bold relief. This feature is especially harmonious when associated with the grays and light-colored materials used in the construction of the building proper.

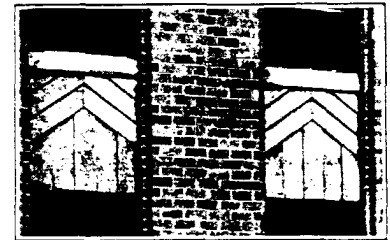
The life of the hard lead spandrel is practically

unlimited, for the durability of hard lead is virtually unaffected by atmospheric conditions. Furthermore, when lead is used there is no trouble from rust or stains, which often result with other metals. This point should receive special consideration, as in many instances fine marble or light stone façades have been seriously discolored beyond reclaim. Hard lead spandrels allow for the finest decorative treatment with no maintenance necessary.

The architects for the new



*The Downtown Athletic Club,
New York*



*A detail of the attractive hard
lead spandrels on the Downtown
Athletic Club Building*

Downtown Athletic Club were Starrett & Van Vleck, and the building contractors were Thompson-Starrett Co., Inc., both of New York. The sheet metal contractors, who installed the spandrels and also formed them, were Herrmann & Grace of Brooklyn.



*Sheet lead flooring in a white lead plant at
East Chicago, Indiana*

Sheet Lead Floor Serves Dual Purpose

WHEN the white lead plant of the Anaconda Lead Products Company at East Chicago, Indiana, was first operated, the premature wearing out of rubber hose from being dragged about over the concrete floor gave considerable trouble. As an experiment, sheet lead $\frac{1}{8}$ in. thick was unrolled and laid over the floor. It was found that the hose, dragged about on the lead instead of concrete, lasted very much longer with the additional advantage that a slipless and noiseless surface was presented for walking. Tools dropped on the floor may temporarily injure the soft sheet metal, but after a time the very softness of the metal causes these wounds to heal. The wearing of the lead seems to be indefinite. Last, but not least, the lead is immune to rust and discoloration.

Another Long Telephone Cable Put to Work

THE Pacific Telephone and Telegraph Company recently opened for service the longest telephone cable west of the Mississippi. It traverses the 415 miles between Los Angeles and San Francisco, and was installed at a cost of \$10,000,000. About 270 miles of this lead-sheathed cable is underground, and the *Pacific Telephone Magazine*, published by the operating company, states that, "The lead sheath and the underground features provide fast, weatherproof communication, said to be five times freer from troubles than the open wire replaced by the new line."

Containing 500 wires, this cable is the second largest of its kind. It is a part of the new \$30,000,000 Canada-to-Mexico cable which is to be completed in a few years. A total of 18,000,000 lbs. of cable make up this particular section.

An interesting new feature of this cable is that 43 miles of it are filled



COURTESY PAC. TEL. & TEL. CO.

Laying the longest telephone cable in the West

with nitrogen gas and the cable plugged with gas-proof dams at intervals. Should the lead sheath be injured in any way, such as being struck by a pick in excavation work, the gas pressure falls and sounds an automatic alarm, which locates the trouble approximately and makes it possible for "trouble shooters" to locate the injury quickly by more accurate methods, and to effect repairs before enough damage is done to interfere with the service.

The cable will carry over 26,000 words of telephone conversation each minute, as well as programs for radio hook-ups, private telegraph messages, and the electrical impulses necessary to operate hundreds of telephone typewriters for brokers, newspapers, government offices and others. The assistance of the Western Electric Company in providing the information contained in this article is gratefully acknowledged.

A BOOK ABOUT LEAD

THE Lead Industries Association has in process of publication a comprehensive book about lead and its uses which it is expected will be ready for distribution in the near future. The object of this book will be to furnish useful information about lead. It will contain about 100 pages, will be profusely illustrated, will be bound in stiff covers and will be of convenient size for ready reference. The chapter heads listed below give a good idea of its contents:

MAINLY HISTORICAL	AMMUNITION
FROM MINE TO FINISHED METAL	THE ARCHITECTURAL AND ORNAMENTAL QUALITIES OF LEAD
GRADES OF VIRGIN LEAD	LEAD COMPOUNDS
PHYSICAL PROPERTIES OF LEAD	LEAD PAINTS
LEAD ALLOYS	METAL PROTECTIVE PAINTS
LEAD AND ITS CHEMICAL CORROSION RESISTANCE	LEAD IN PLUMBING
LEAD STORAGE BATTERIES	SOME MISCELLANEOUS USES OF LEAD
LEAD-COVERED CABLE	PRINCIPAL INDUSTRIES USING LEAD

It will contain a number of valuable tables. The properties of lead listed, including physical, electrical, optical, thermal and mechanical properties, will be the most comprehensive tabulation of its kind ever published in one book. It is felt that this work will be of value to anyone using or contemplating the use of lead in any form.



The Washington Athletic Club, Seattle, just completed, is painted throughout with white lead and oil

[[The Lead Industries Association invites inquiries on any subject relating to lead and will be glad to cooperate in the solution of your lead problems.]]

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