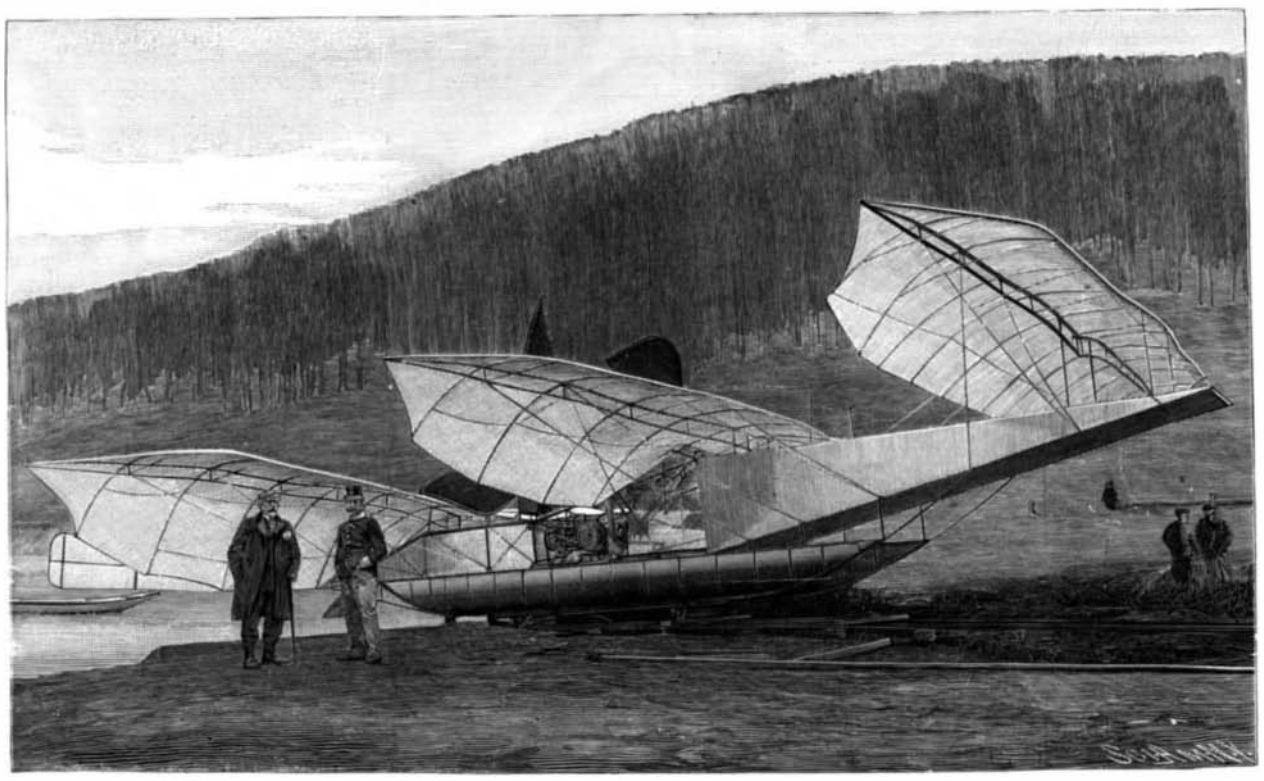
THE KRESS AEROPLANE.

The most recent attempt to solve the problem of artificial flight has been made by W. Kress, a German engineer, who for twenty years has patiently labored on an aeroplane in which he has embodied his ideas.

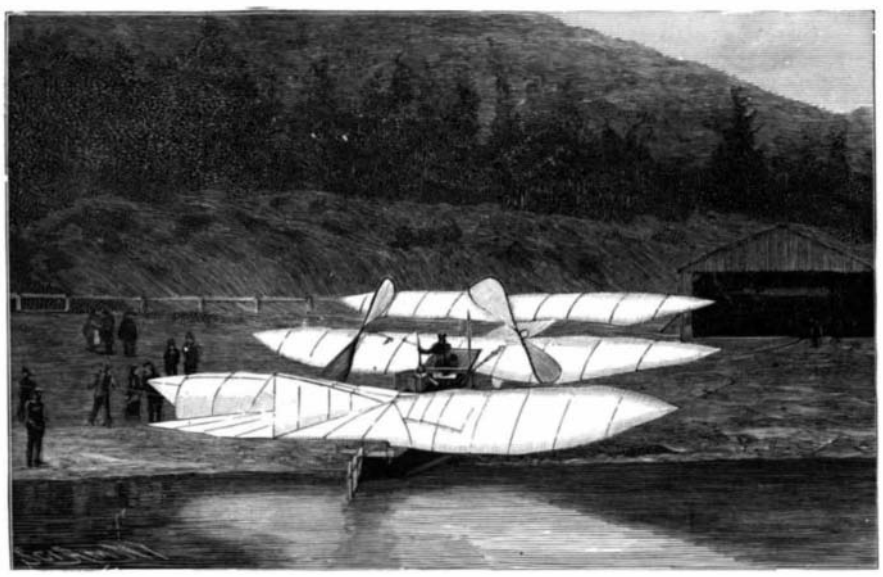
The Kress aeroplane consists of an ice-boat having two keels and a long stem. The keels serve as runners when the machine is traveling over ice or snow. Two resilient sail-propellers, rotated by a benzin-motor in opposite directions, drive the apparatus. Above the boat, arched sails, constituting resistant kite surfaces, are carried, one sail being mounted somewhat above the other, so that it will receive an impinging body of air without interference from the other sails. The aeroplane thus constituted is guided by a horizontal and a vertical rudder, both of which, however, are used only in flying.

Owing to lack of funds the inventor could not equip his air-ship with a benzin-motor of the special construction and power desired, and was therefore compelled to use an ordinary automobile-motor. Thus fitted out the aeroplane was first tried on water. For it is Mr. Kress' opinion that water-trials should first be made in order to ascertain whether the motor, propellers, rudders, and other parts have been properly arranged and are trustworthy and perfectly efficient in operation. Only when the safety of the machine has thus been proven should aerial flights be taken. The sense of security obtained by numerous water-trials and the increased speed attained with each trial will finally give to the aeronaut that confidence which will enable him to soar aloft. That moment, according to Mr. Kress, may come unawares; the ship may of its own accord leave the surface of the water.

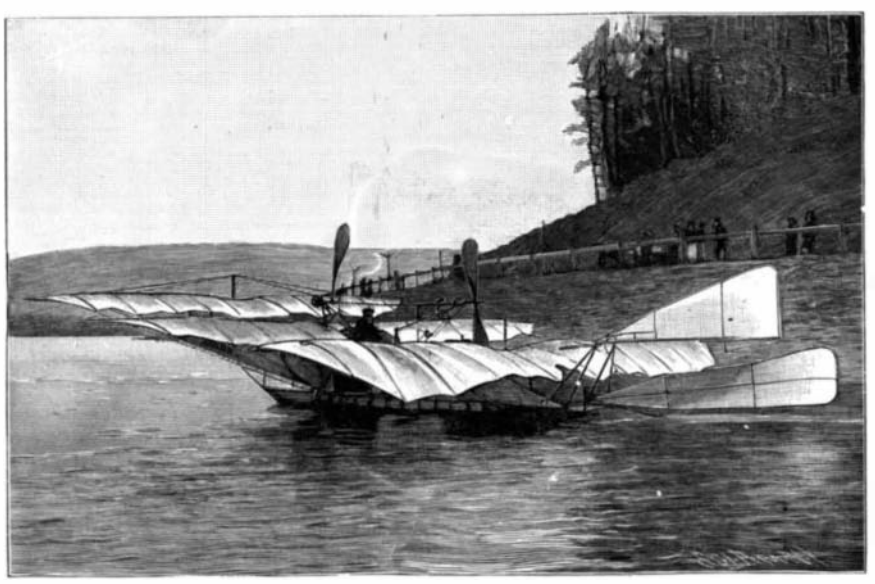
So far as the preliminary water-trials are concerned, the Kress aeroplane seems to have met its inventor's expectations. In the presence of an officer of the aeronautical division of the German army, the flying-machine was taken from its housing and carted to a nearby lake. Kress seated himself in the boat and pulled the starting lever. The propellers drove the machine along at a uniform speed, according to the accounts which have been received. In order to test the maneuvering power of the contrivance Kress is said to have performed various evolutions and to have succeeded even in making headway against the wind. The steering apparatus seems to have acted efficiently. The motor, however, proved inadequate. With a motor of less weight and greater horse power the inventor believes that his flying-machine would be an assured success. Lack of funds may prevent him from carrying out his plan with an improved motor.



THE KRESS AEROPLANE.



THE START OF THE AEROPLANE.



THE KRESS AEROPLANE SAILING ON WATER.

The Italian government has purchased the statues and paintings in the Villa Ludovisi. It has Guercino's "Aurora," one of the best works of the master of the decadent schools. The ancient statues are most important, including the Ludovisi "Juno" and other famous statues, busts, and bass-reliefs.

THE VERTICAL GROWTH OF NEW YORK CITY.

It is a fact that no one in the closing years of the past century left the imprint of his hand so clearly upon the surroundings and conditions of modern city life as the engineer. If anyone doubts this, we invite his attention to the two accompanying photographs showing the sky line of the city of New York, taken, one at the beginning, and the other at the close of the last decade of the century. In the year 1890 the art of composite steel-and-stone building construction was becoming firmly established, and, indeed, in the city of Chicago, to whose enterprise the development of the lofty office building is mainly due, a dozen or more giant structures, ranging from twelve to eighteen stories in height, were to be found in that year scattered through the business portions of the city. New York, ever conservative in municipal matters, whether it be in electric lighting, electric transit or underground construction, was only commencing in 1891 to erect at the southern end of Manhattan Island those towering structures which, to-day, render this portion of the city one of the most marvelous spectacles in the world. Architecture of the composite steel-and-masonry type has helped to solve the most difficult problem with which New York city is confronted. The shape of the island is such that a business center such as that represented in our engravings has no possibility of enlarging its borders, being shut in by the broad waters of the Hudson and East rivers. If room was to be found for the rapidly multiplying financial interests which gravitate to the district lying between City Hall Park and the Battery it could only be secured in a vertical direction by building story upon story and utilizing that free space to whose occupation there was no limit except such as might be imposed by conditions of a structural and operative kind. The limit to the height of these buildings has been determined indeed far more by the conditions of their operation than by any difficulties of a structural kind; since it would be perfectly practical to construct office buildings 500 or 600 feet in height, if there were any advantage in so doing. It was found, however, that the space occupied by elevators became so great, when a building exceeded a certain number of stories in height, as to reduce very seriously the available office floor space, and by common consent it seems now to be agreed that the limit of economic height lies somewhere between sixteen and twenty stories.

The two views of the lower end of Manhattan Island were taken from the New Jersey side of the Hudson River, and in order to make clear the extraordinary height and mass of the new structures, we have indicated upon the sky line view of 1891 in dotted lines the buildings which have been erected subsequently to that date. Commencing from the Battery, we see first the huge western façade of the Bowling Green building, a sixteen-story structure, which had the reputation at the time of its construction of being the largest office building in the world, a claim which we believe has not even yet been challenged. On the opposite side of Broadway, and a little further north, is the Standard Oil building, while to the northwest of it are seen the upper stories of the Johnson building. Facing east on Broad Street is the twenty-story Cable building, conspicuous by reason of the rather shapely twin domes which surmount its eastern façade. To the west of the Cable building, fronting on Broadway, is the Manhattan Life building, one of the first lofty office structures to be erected in New York city. The dome of the Manhattan Life structure was for several years the home of the Weather Bureau Service in this city, and from its flagpole were displayed the storm and weather signals that have come to be so highly appreciated by people both ashore and afloat. On the opposite side of Broadway is the magnificent twenty-one story Empire building, and a little further north, at the corner of Broadway and Pine Street, rises the tower-like pile of the American Surety building, whose coping, like that of the Empire building, is over 300 feet or more above the sidewalk. To the northeast of the American Surety building, and at the corner of Nassau and Cedar Streets, is the National Bank of Commerce building, an eighteen-story structure, while on the opposite side of Cedar Street is a lofty building whose proportions would be more impressive were it not so greatly overtopped by its bulky neighbor. Coming back to Broadway, we see fronting us on the western side of the thoroughfare the stately pile of the Washington Life Insurance building, which can boast of sixteen stories to the cornice, with four additional floors in the roof. Opposite this, at the corner of Liberty and Broadway, is the Singer building. Looking down upon the venerable St. Paul's churchyard from the opposite side of Broadway is the slender pile of the St. Paul building, whose sheer height of 308 feet would look more impressive were it not entirely overtopped by that nearby mammoth structure, the Park Row building, whose topmost office floors are 340 feet above the street level, while the top of the cupolas on the two towers lack only 10 feet of being 400 feet above the same level.

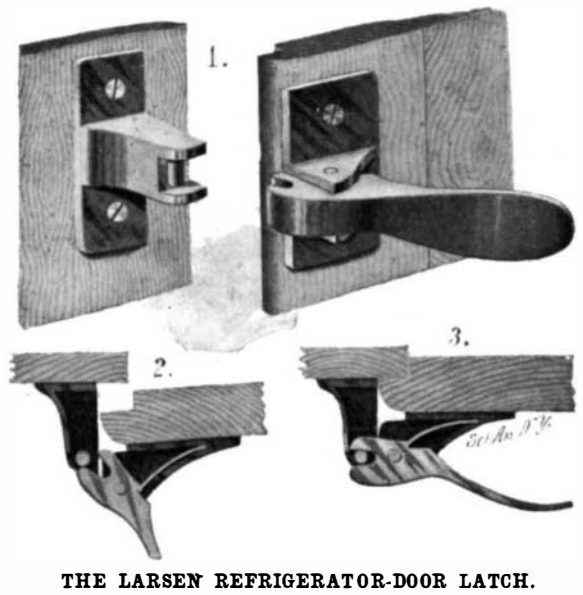
The third view of our series is taken from Grant-

wood, on the New Jersey side of the Hudson River, and gives a comprehensive view of the northern portion of Riverside Drive and the vicinity. It is strongly illustrative of the rapidity with which New York city is growing that all but one of the large public buildings shown in this view have been constructed within the last decade, the one exception being the Teachers' College, which was erected some twelve years ago. Commencing at the right of the picture we see one of the massive arches which will carry the tower, over 400 feet in height, of the new Cathedral of St. John the Divine. To the north of it is St. Luke's Hospital, while the imposing pile of buildings in the center of the picture is the new home of Columbia University. To the northwest of the University is Barnard College, and to the north of it Teachers' College and the classic pile of Grant's Monument. At the extreme left of the picture the high ground begins to slope toward the Manhattan Valley, over which the Riverside Drive is carried by a broad steel viaduct to a high level connection with the Washington Heights beyond. This portion of Manhattan Island may well be called the Acropolis of New York; for by the time the Cathedral has been completed plans for the beautification of this locality will also have been completed which will render it the site of one of the most imposing collections of public buildings in existence.

A SIMPLE DOOR LATCH FOR REFRIGERATORS.

In a patent recently granted to Anton Larsen, of 134th Street and Brook Avenue, Manhattan, New York city, a novel latch is described, by means of which a refrigerator-door can be hermetically sealed when in a closed position without effort on the part of the operator. The figures show the positions assumed by the parts in closing and opening the door.

Secured to the jamb is a keeper having a keeper-pin. On the door a lever is pivoted, formed with a forked or slotted end to engage the keeper pin. A spring presses upon a shoulder on the inner side of the lever so as to hold the lever in an open position, and the slotted or forked end, when the door is closed, passes upon the keeper-pin, so that a further closing of the door will cause the lever to turn on its pivot, owing to the engagement of the pin with the slotted end. When the lever is swung during the closing of the door, the spring is compressed; and when the door has moved nearly into a final closing position, the spring presses on the lever and by its tension closes the door hermetically without the aid of the operator. Thus the spring has two functions—to hold the slotted lever in proper position to engage the keeper-pin and to force the door finally to its seat. In opening the door, the handle is grasped and swung outward, so as to compress the spring until the lever has passed a central position. The door is thus partly opened by the bearing of the lever against the keeper-pin. On a further outward pull on the lever, the door finally swings open, the slotted end leaving the keeper-pin and remaining in position by the action of the spring.



THE LARSEN REFRIGERATOR-DOOR LATCH.

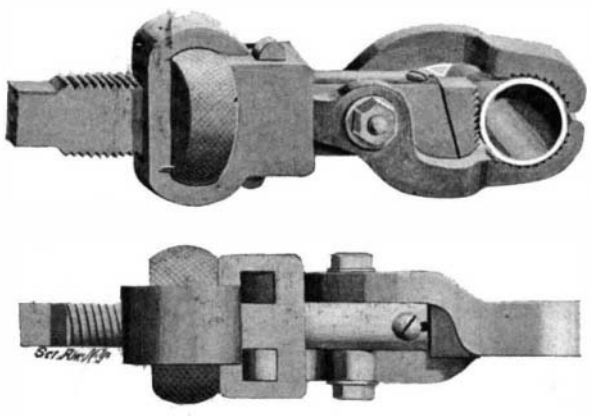
The door-lock is simple in its construction, and therefore cheaply manufactured.

It is stated that Marconi has at last succeeded in solving the problem of transmitting telegraphic messages by his system across great distances. From the results of his experiments which he has just completed, he hopes to be able to place Great Britain and America in communication by this means before the lapse of another twelve months. The high mast which constituted the most important difficulty which militated against the realization of such an accomplishment has been solved. The masts now will not be more than 200 feet in height. Marconi has discovered a process by which he can lengthen the waves to any desired extent, and they will travel the full distance without losing their potentiality to any appreciable extent. The waves travel close to the surface of the water, thus smoothly following the curvature of the earth. Particulars regarding the new apparatus by which Marconi has achieved this end are not yet obtainable, owing to the patents not having been secured, but Marconi is optimistic of the complete practicability of the scheme.

A TRIPLE-JAWED PIPE-WRENCH

A perfectly uniform grip on a pipe without marring or indenting the metal cannot be attained with every pipe-wrench. But in the device illustrated, the inventor, Mr. Christoffer Peterson, of Los Banos, Cal., has provided the necessary means for securely gripping the pipe without the usual attendant disadvantages mentioned.

In the threaded stock of the wrench a spring-pressed pivot slides, on which two main jaws are mounted to turn. By reason of the sliding movement of the pivot,



THE PETERSON THREE-JAWED PIPE-WRENCH.

the jaws can readily grip large and small pipes. The two main jaws are actuated by a slide in which a nut turns, having cut-out portions whereby it can be disengaged from the threads of the stock to permit the free movement of the slide and nut on the stock. By means of pins on the nut, the cut-out portions can be brought in register with the threads on the stock.

In order to engage the pipe midway between the gripping points of the two main jaws, a third, auxiliary jaw is employed, which is held in place by a tongue engaging an inclined groove in the stock. Springs, adjustable in tension by screw-caps on the stock, press against the tongue at bottom and top.

When the three jaws engage the pipe and the handle of the wrench is swung in one direction, the pipe is turned. On the return swinging motion of the handle, the three jaws glide over the pipe without gripping, to permit a fresh hold to be obtained. The auxiliary jaw readily adjusts itself on the pipe to take up any slack in the main jaws, so that the three jaws operate in unison and bear at different points to prevent undue marring or indentation.

AN IMPROVEMENT IN CAPSULING-MACHINES

In order to cover the stoppered ends of bottles and jars, soft-metal caps are used, which are affixed to the neck by machines of special construction. An improved and highly efficient machine of this type has been devised by Eli D. Harrington, of Westfield, N. Y.

To the base of a substantial frame a stationary jaw is firmly secured, which coacts with a movable jaw. Both jaws are provided with rubber gripping surfaces. The movable jaw is carried by a lever fulcrumed in the frame, and is normally spring-pressed to open the jaws.

Movement is imparted to the lever by means of a shaft mounted in the upper part of the frame and provided with an eccentric which, by means of a ball and socket connection, actuates the lever and consequently the jaw. The ball and socket connection, it is evident, readily accommodates itself to the swinging movement of the jaw. The connection is, furthermore, adjustable, so that the movable jaw can be pressed more or less in contact at its side edges with the fixed jaw.

By reason of this adjustable connection the jaws can be set to accommodate the bottle-neck; and by reason of the ball and socket, the cap is properly pressed around the bottle-neck.

Self-burying Fish.

Edward Tregear, of Wellington, N. Z., sends an interesting letter to The Spectator, which we quote in full:

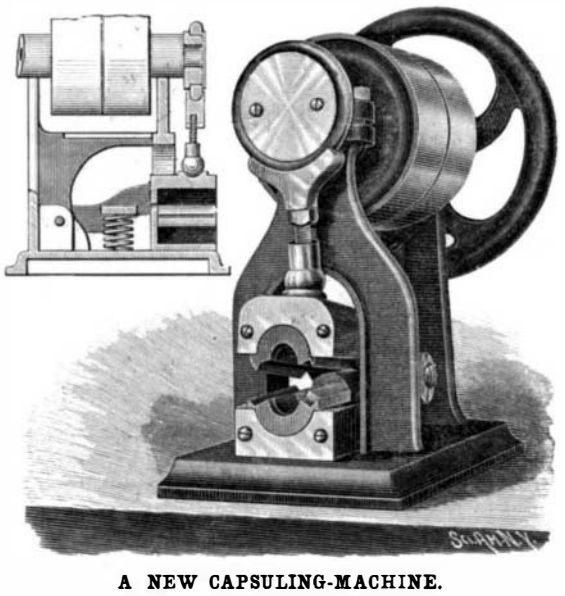
A fish of curious habits exists in New Zealand, and as it has apparently hitherto escaped the notice of naturalists, you will perhaps admit a brief account of it. The fish is called by the Maories the *kakawai*. Its habitat is very extensive in the North Island, and it may be found on the Wairarpa Plains, the Forty-Mile Bush, etc. It is generally discovered when a man is digging out rabbits or making post-holes in the summer-time, and it lies at a depth of a foot or two feet under the soil. The character of the soil, whether sandy or loamy, does not seem to matter. The fish is from two to three inches long, silvery, shaped like a minnow, but rather more slender and tapering. It appears to be dead when exhumed, and if dug up in the summer, and put into water, it dies at once. If, however, it is brought to daylight in May or early June (the end of autumn), when the rains are beginning to make the soil thoroughly wet, and put into a tub of water, a curious thing happens. After a day or two it casts its skin, which sinks to the bottom, and the fish plays about, bright and lively. When dug up in summer, there appears to be a growth of skin, or perhaps of a dry, gummy exudation, which seals up the head and gills. Apparently this enables it to æstivate through the dry weather, and seals the fish as an Indian fakir is sealed up before he goes in for a long fasting burial. Of course, in winter there must be marshy spots or pools in which the fish can swim and propagate, but often all evidence of such natation disappears in summer, and the hot, dry, waterless plain seems the last place on earth in which to find a fish. When the skin is cast off, vivid little spots of red appear on the body, so that some people have said that the fish is a small trout. This is not the case (although they are now used as bait for trout); the *kakawai* was well known to the natives ages before trout were introduced from England; well known, although the name by some chance has been missed in making the Maori dictionaries, just as naturalists have missed noticing the fish.

The Building Edition for February.

The Building Edition for February is the most important number of this handsome magazine which has ever been issued. It is the first number to contain the new features to which we referred in our last issue. In addition to the usual collection of interesting houses, we present several views of the Architectural League Exhibition, now in progress, and also a number of rooms arranged particularly for exhibition purposes by a well-known establishment. The literary contents includes, in addition to editorials, an interview with Bruce Price, Esq., architect of the American Surety building. This interview is most interesting, and the information conveyed is entirely new. "Notes and Queries and Correspondence" and "New Books," "New Building Patents" and "Technical Review of the Month" are a few of the new features. The number is as handsome as it is readable.

The Current Supplement.

Among the interesting articles in the current issue of the Supplement is "Dock Equipment for the Rapid Handling of Coal and Ore on the Great American Lakes," an elaborately illustrated article of which this is the first installment. "Foreign Locomotives at the Exposition of 1900" is accompanied by seven engravings. "The World's Pig Iron and Steel and America's Supremacy" gives a graphic representation of the production of steel by the principal countries from 1873 to 1899. "Some Links Between Natural History and Medicine" is by J. Arthur Thomson. "Progress of Agriculture in the United States" is by George K.



A NEW CAPSULING-MACHINE.

Holmes, of the U. S. Department of Agriculture. "The Optics of Trichromatic Photography" is by F. E. Ives. "Model System of Water Works" is by F. O. Jones, and describes the system which is within the reach of the smallest towns. The usual "Trade Suggestions from United States Consuls" and "Trade Notes and Receipts" are published.

Contents.

(Illustrated articles are marked with an asterisk.)