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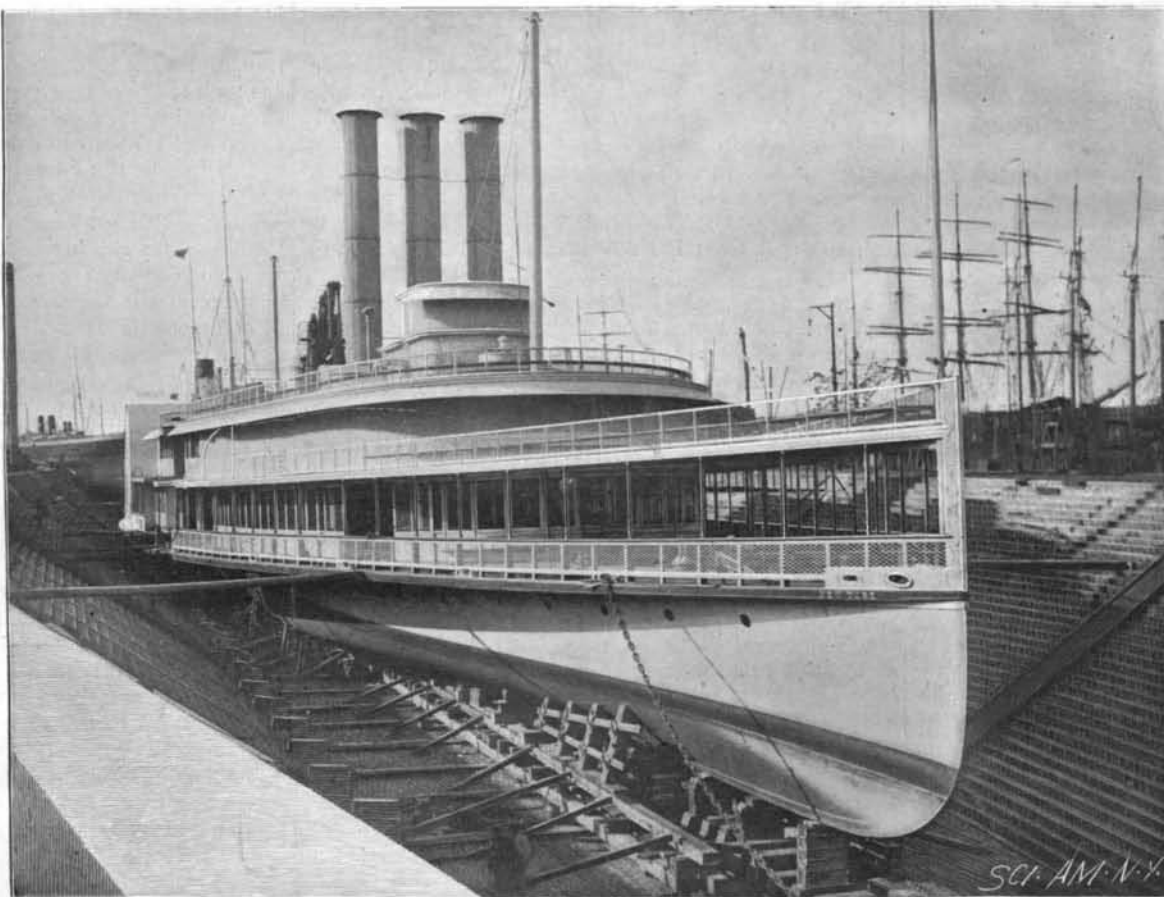
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## LENGTHENING A HUDSON RIVER STEAMBOAT.

Whenever the historian shall take up his pen to write the complete story of steam navigation, if he be a fit man for his task, with a due sense of perspective and proportion, he will write large and lengthily the chronicles of "steam-boating" on the waters of the Hudson River. Here, surely, if anywhere, we must look for the cradle and nursery of the practical steam propelled freight and passenger carrying vessel; for when Robert Fulton dispatched the Clermont, a 160 ton steamer, on its first trip from New York to Albany on the morning of August 7, 1807, he established his claim as the father of the steamship with as much certainty as the Rocket in a later day entitled Stephenson to be called the father of the locomotive.

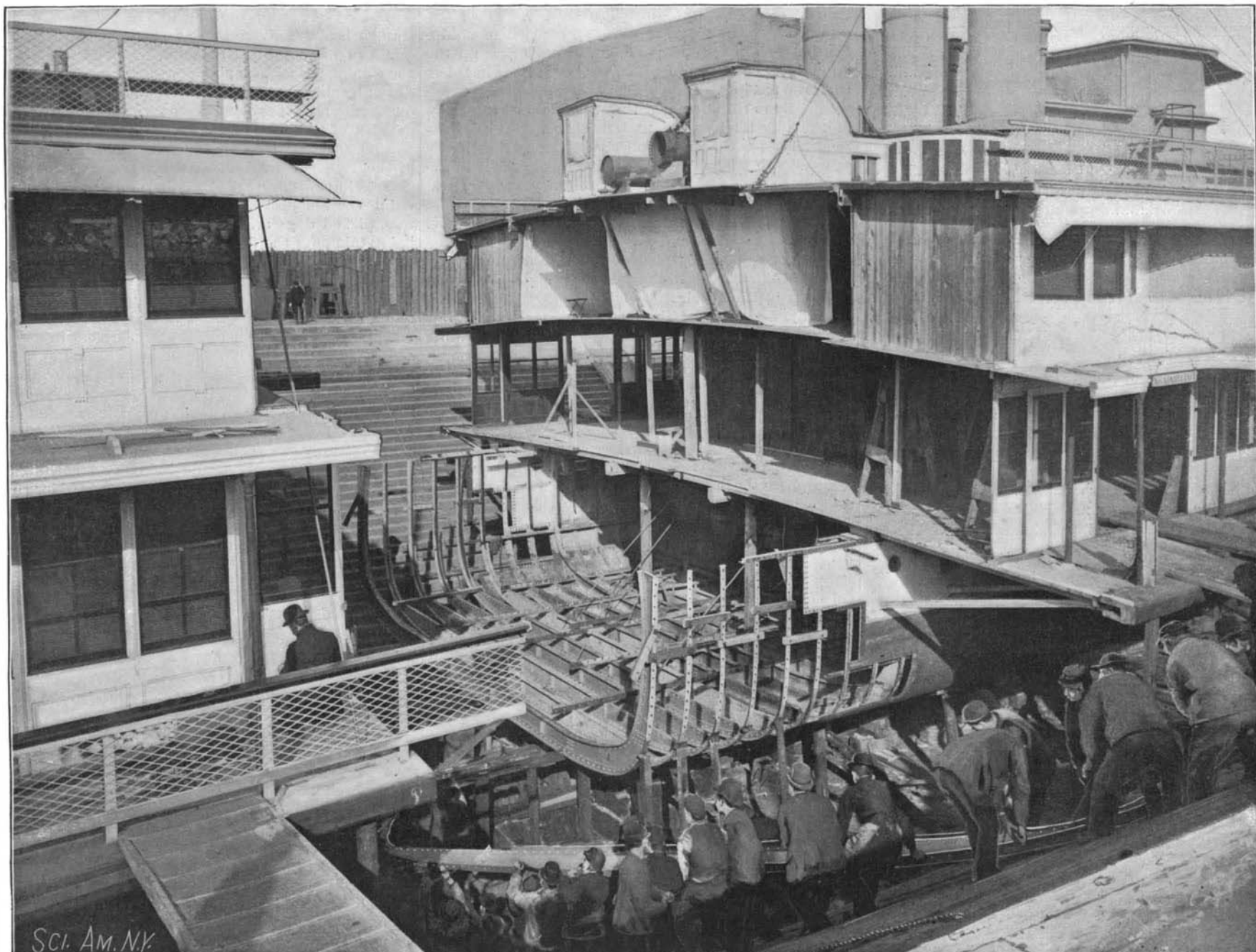
The Clermont was a worthy ancestor to the fleet of truly magnificent boats which have made



BOW VIEW, SHOWING SLIDING WAYS.

the Hudson River service the most famous of its kind in the world. The requirements of the service have produced two distinct classes of boats, those for night service, carrying both freight and passengers, of which the Adirondack, of the People's Line, is the finest and latest example, and another class for day service, represented by the historic Mary Powell and the swift and luxurious New York and Albany, of the Albany Day Line. Each type of boat has been designed with special reference to the necessities of night or day service. The night boats, as exemplified in the Adirondack, are characterized by large freight-carrying capacity, lofty tiers of state-rooms for the accommodation of passengers, and a high rate of speed, the boat named having made about 20 knots under favorable conditions. The day boats, carrying no

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LENGTHENING A HUDSON RIVER STEAMBOAT—THE HULL PULLED APART—FRAMING THE NEW SECTION.

**LENGTHENING A HUDSON RIVER STEAMBOAT.**

(Continued from first page.)

freight, have no sleeping accommodation, and are built with the sole object of giving the traveler a swift passage with every possible facility for seeing the beauties of the Hudson River. As compared with the night boats they sit low in the water, and one misses the towering superstructure, the dining saloons, parlors, etc., being all contained on the main and upper decks. They are distinguished by the extreme fineness of their lines and a general rakish and yacht-like appearance that is not belied by the speed of 23 miles an hour of which they are capable under favorable conditions.

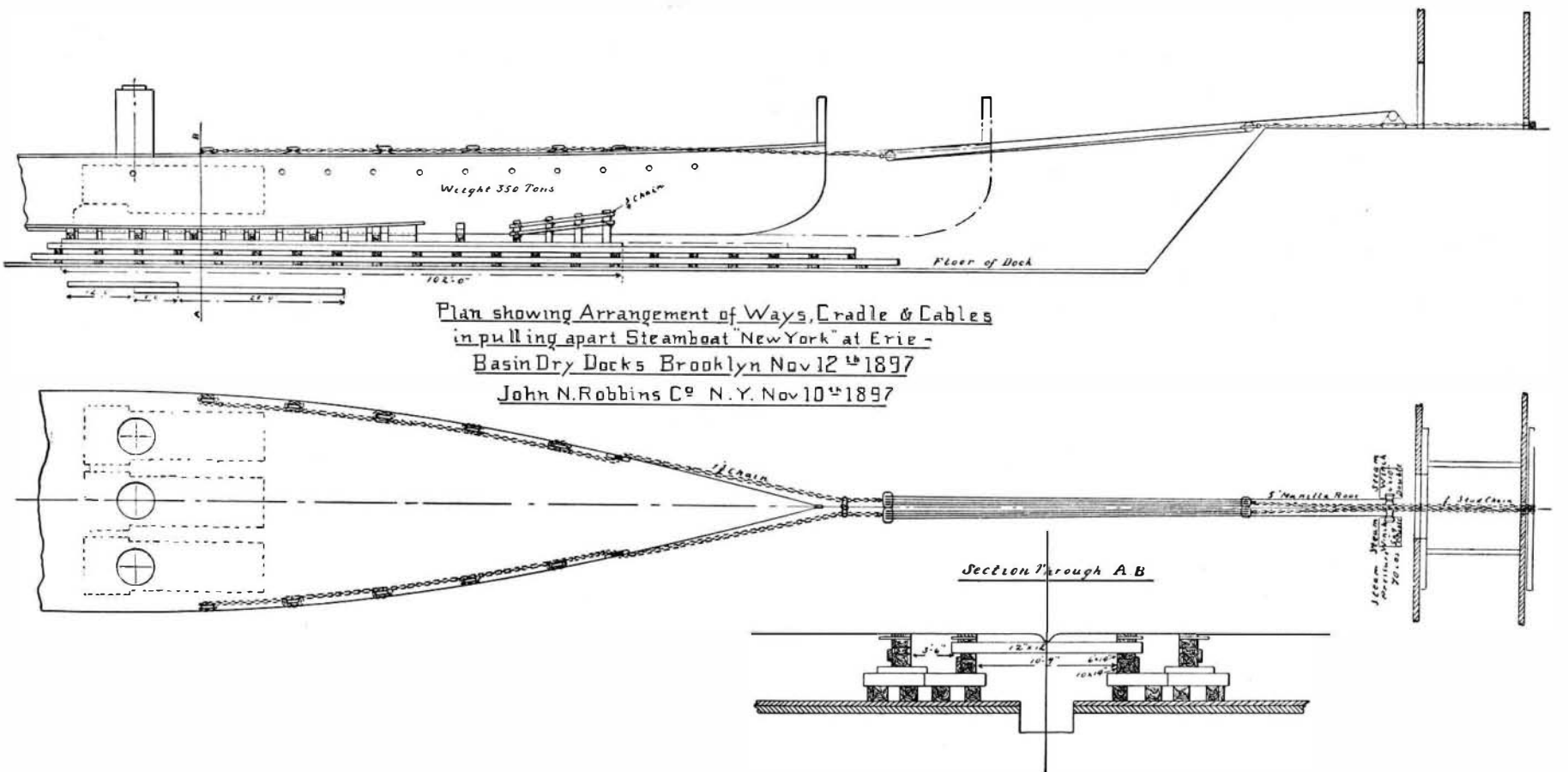
The twin boats of the Albany Day Line were built with the object of enabling the tourist to leave New York at a reasonable hour in the morning and reach Albany in the early evening; or, should he prefer it, to make the round trip between New York and Poughkeepsie between nine in the morning and half past five in the evening. As the distance is 150 miles, and the current varies from one to two and a half miles an hour and seven different landings have to be made en route, the actual speed of these boats has frequently to be maintained at 20 miles an hour to enable them to make the run within the nine hours. This large reserve of power enables them in cases of emergency or delay to run up to 23 miles an hour, and herein lies the secret of the remarkable regularity with which the landings are made. This is seen at Poughkeepsie, where the passengers that are making the round trip are timed to land five

the radial type, at once absorbs much of the engine power and sets up an uncomfortable vibration in the boat. Steam is supplied by three return-flue boilers  $9\frac{1}{4}$  feet diameter and 33 feet long.

As the boat is designed for giving full opportunity to see the beauties of the river, the saloons and private parlors on the main and upper decks are liberally supplied with glass, the partitions between the windows being kept down to the lowest practicable limit. A special feature, borrowed no doubt from the railroad observation car, is a set of private observation parlors, located just forward of the paddle boxes, the fronts of which consist of large plate glass bay windows, which reach from the ceiling almost to the floor. Taken altogether, the New York, with its long unbroken lines of hull and superstructure, its double row of continuous plate glass windows, its shapely paddle boxes, and its pale, buff-colored smokestacks standing three abreast, is as dainty and picturesque a piece of naval architecture as can be seen anywhere in American waters.

The sister ship, the Albany, which was built in 1880, was lengthened 30 feet during the winter of 1892, and the results were so satisfactory that the company recently determined to make the same addition to the length of the New York. The operation of cutting the hull of a vessel in two, hauling it apart, and building in a new section at the point of division, is a delicate operation that calls for the best skill of the shipbuilder. The Albany was sent down to Wilmington to be lengthened; but it was decided that the local ship-

and was carried entirely by the ways. The pulling apart of the hull was accomplished by means of four  $1\frac{3}{8}$  inch chains, a pair of 5 inch manila ropes working in fourfold blocks, and a couple of steam winches located at the head of the dock. A chain was led through the hawse hole on each side at the main deck and wound around four successive bits so as to secure a thorough distribution of the strain. Just in front of the stem they were lashed together, and made fast to a pair of fivefold blocks. The inshore blocks were connected to  $1\frac{3}{8}$  inch chains, which were led back through one of the dock buildings and secured to a  $12 \times 12$  stick of timber placed on the outside of the building at the ground level. The falls of the tackles were led to a pair of steam winches. In cutting apart the iron hull, all that was necessary was to cut off the rivet heads and knock out the rivets. This was done in every case at the original butts. The three decks, partitions, guards, and sponsons, were then sawn through and everything was now ready for the pull. At a given signal the forward half of the boat, weighing 350 tons, began to move slowly and steadily forward, and in exactly 5 minutes and 30 seconds it was stopped precisely at the measured mark, thirty feet ahead on the ways. Mr. W. D. Dickey, the superintendent of the Dry Dock Company, stood on the floor of the dock under the bow and directed the enginemen at the winches by signal what was to be done. When the two portions of the boat were lined up with fine piano forte wire, it was found that one side of the bow had to be raised only  $\frac{1}{8}$



**METHOD OF SEPARATING THE TWO SECTIONS OF STEAMBOAT NEW YORK.**

minutes before the arrival of the return boat from Albany. The transfer is made with unfailing regularity.

The New York, which forms the subject of our front page illustrations, was built in 1887 at the yards of the Harlan & Hollingsworth Company, Wilmington, Del. Her dimensions are as follows:

Length on water line.....	301 feet.
Length over all.....	311 "
Breadth of beam, moulded.....	40 "
Breadth of beam, over guards.....	74 "
Depth, moulded.....	12 " 3 inches.
Draught.....	6 "
Tonnage (net 1091-81).....	1,552

The hull is built of iron, and everything was done to cut down the weights and secure the light draught which is necessary for running at high speed over the shoals of the upper river. The frames, which are spaced 2 feet apart, are 4 inches by 3 inches by 7-16 inch; the reverse bars are  $2\frac{1}{2}$  inches by  $2\frac{1}{2}$  inches by 5-16 inch; the stringers are 4 inches by 3 inches by  $\frac{3}{8}$  inch, and the floors 16 inches by  $\frac{3}{8}$  inch. The shell plating is  $\frac{3}{8}$  inch throughout, except the sheer strake and garboards, which are  $\frac{1}{2}$  inch and 7-16 inch respectively. The hull is divided into four watertight compartments by bulkheads, which extend to the main deck and are free from doors or passageways, the compartments being entered by stairways from this deck. The boat is driven by a standard American beam engine of 3,850 horse power, with a cylinder 75 inches diameter by 12 feet stroke, provided with a Stevens cut-off. The 30 foot paddle wheels are of the "feathering" type, in which the steel buckets enter and leave the water perpendicularly, and thereby avoid that beating of the water which, in wheels of

yards were quite equal to a task of this kind, and accordingly the New York was taken over to Robins' shipyard at the Erie Basin. Here she was floated into the dry dock and placed upon the keel blocks and bilge blocks in the usual manner. It was decided to cut the hull at a point between the engines and boilers, and the first step was to build launching ways beneath the forward half of the hull, and transfer to it the load that was carried by the blocks. The accompanying diagram, which has been prepared from drawings furnished by the John N. Robins Company, shows in detail the construction of the ways and the rigging of the gear with which the vessel was pulled apart. The fixed ways, which were 10 inches deep by 14 inches wide, were laid upon blocking on the floor of the dock and well shored guide pieces were spiked to the outside of these ways to keep the sliding ways in place. The latter were built of  $6 \times 14$  inch timbers and were tied together with  $12 \times 12$  transverse timbers at regular intervals. The space between the transverse timbers and the floor of the hull was filled in with blocks and wedges, and at the forward end shoring pieces were substituted to accommodate the decreasing width and the taper of the bow. The length of these ways was 102 feet, and they were placed 10 feet 9 inches apart in the clear. At a distance of 3 feet 9 inches on the outside of the main ways, a pair of additional ways were built to take the weight of the boilers. The rubbing surfaces of the ways, which of course were planed and smoothed, were freely lubricated with a mixture of tallow and fish oil. When everything was completed, the wedges were gradually driven home until the weight had been lifted from the keel and bilge blocks

of an inch and the stem jacked over about an inch—a highly creditable result. During the building of the ways, the fifteen frames for the new section of the hull had been made in the shops to model. The work of carrying them into the dock and putting them in place was done by hand, as shown in the engraving. It commenced on Saturday morning, and by noon of the same day the work was in frame. The framing and plating is similar to that of the rest of the hull, with the exception of two additional sister keelsons of  $\frac{3}{8}$  inch plate, which are spaced about 16 feet apart.

The owners of the shipyard are to be congratulated on the rapidity and success with which this novel and difficult piece of work was done. The work of cutting the rivets was started at 1 A. M. Thursday, November 11, and completed that night. The ways were completed by 3:30 P. M. on Friday, and the hull was in frame by noon on Saturday, the total working time being 17½ hours. It is expected that within 15 days from the time the boat was docked, the new hull and the main deck work will be completed.

It is estimated that the additional buoyancy afforded by the new section of the hull will lighten the draught by  $5\frac{1}{2}$  inches. This, on a model of such great beam and fine lines as the New York, will give her an easier waterline and will, if anything, increase her speed. However, as the lengthening was undertaken with a view to increasing the passenger accommodation, which at present is 2,500, it is probable that with a larger load the speed will remain at 23 knots with forced draught or 20 knots under ordinary working conditions.