

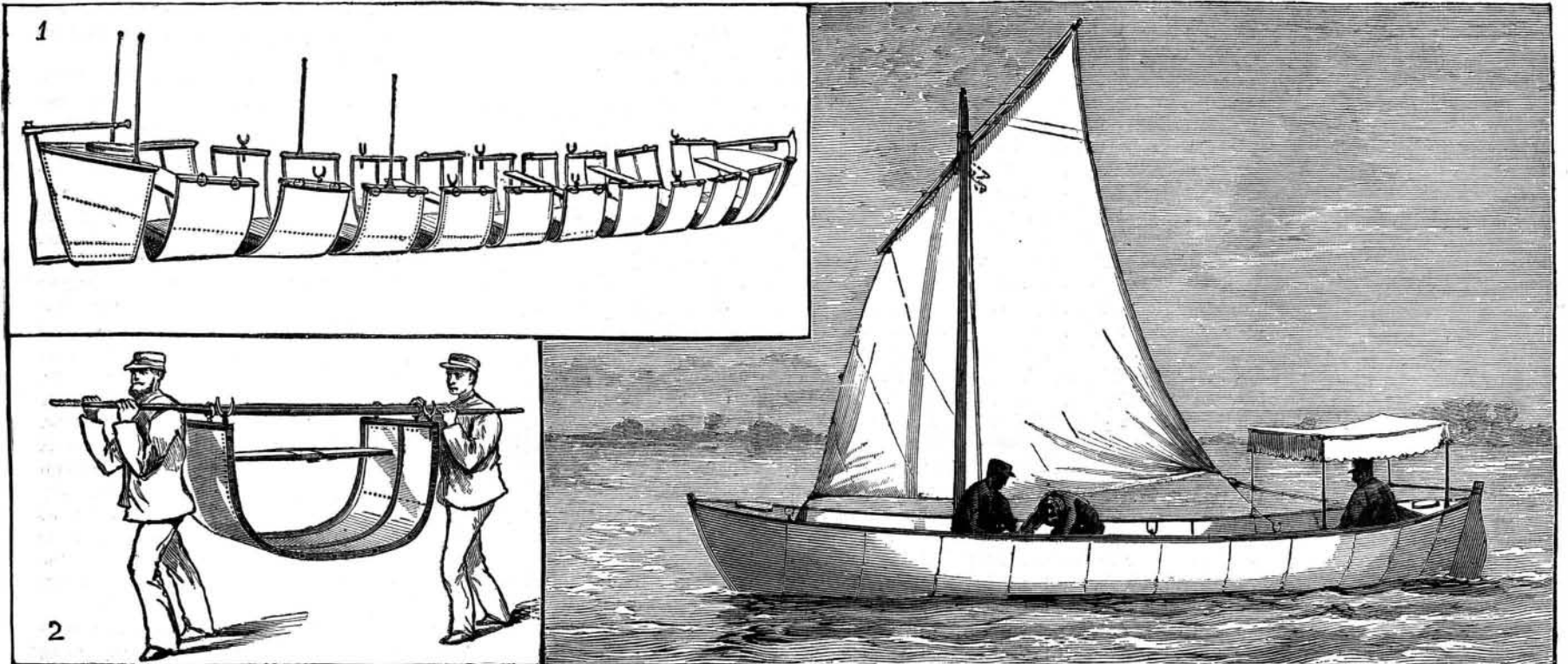
SECTIONAL STEEL BOAT FOR MR. STANLEY.

The boat shown in the accompanying cut was constructed by Messrs. Forrest & Son, in thirteen days, for use on Mr. H. M. Stanley's expedition in relief of Emin Pasha. It is constructed of Siemens-Martin steel, galvanized, and is divided into twelve sections, each weighing 75 lb. India-rubber is placed between the points of intersection, to prevent leakage, while the fore and aft sections are water tight, to give additional buoyancy to the craft. It is 28 ft. long and 6 ft. beam

to which it is united are mounted loosely upon the shaft, but by shifting a suitably arranged lever, the drum and its pulley may be so moved as to bring the two pulleys into engagement. When the lever is released, the drum and pulley swing away from the first pulley, and their shaft revolves independently of the drum. Upon the crank shaft there is also a worm, which may be moved to throw it out of engagement with the gear wheel driving the windlass mechanism. It is evident from the simplicity of this apparatus,

Testing a Gigantic Cannon.

The first three proof rounds of the powerful new gun supplied by the Elswick Works for her Majesty's bar-bette ship Benbow were fired February 10, at the butts at Woolwich Arsenal, the result so far going to show that this is the finest specimen of artillery yet produced in this or any other country. Among the "Woolwich Infants" it is like the famous Queen Elizabeth's bronze gun in Dover Castle among the old caronades. In length it is 524 in., or nearly 44 ft. The



1. The twelve sections. 2. Carrying a section; weight, 75 pounds. 3. The boat afloat.

SECTIONAL STEEL BOAT FOR STANLEY'S AFRICAN EXPEDITION.

and 2 ft. 6 in. deep, and is furnished with ten oars and a large lug sail. The boat may be very rapidly taken apart and put together again, and each section may be carried by two men.—*Illustrated London News.*

CONVERTIBLE ANCHOR AND FREIGHT HOISTING APPARATUS FOR VESSELS.

Every large steamship is provided with several small independent engines, so distributed about the vessel that the work of loading and unloading may be most expeditiously carried forward. In addition, there is usually a special engine designed to handle the anchor, and which, of course, performs no other service. By means of the invention shown in the accompanying engraving, this anchor hoisting engine may be also employed for the handling of freight, thus utilizing a machine that would otherwise be idle except during a very brief period, and thereby providing, practically, additional power without corresponding expenditure. The steam capstan windlass used in connection with this apparatus is well known and appreciated, being used by all the most important lines upon this side of the water. As all parts of the windlass are connected to the same plate, the whole must always remain in line, independent of the twists and strains to which the deck may be subjected. The engines are counter-balanced, and, together with the locking gear of the windlass and the friction levers, are placed in the most convenient position possible. An extremely simple device, placed in a well just below the worm gear, provides for the automatic lubrication of each tooth as the wheel revolves; this reduces the friction, and prevents cutting and wear.

Upon one end of the crank shaft is mounted a sprocket wheel, over which passes a chain leading to a like wheel on a shaft provided with a grooved friction pulley, which may be engaged by a second pulley on a shaft carrying the hoisting drum. This second pulley and the drum

and the consequent fewness of the parts, that there is no danger of derangement, while by simply shifting either of two levers the engines may be caused to operate either windlass or hoisting apparatus.

This apparatus is manufactured by the American Ship Windlass Company of Providence, R. I.; to whom all communications should be addressed. This arrangement, although but recently patented, has already been placed upon two steamers and has been ordered for two others now building.

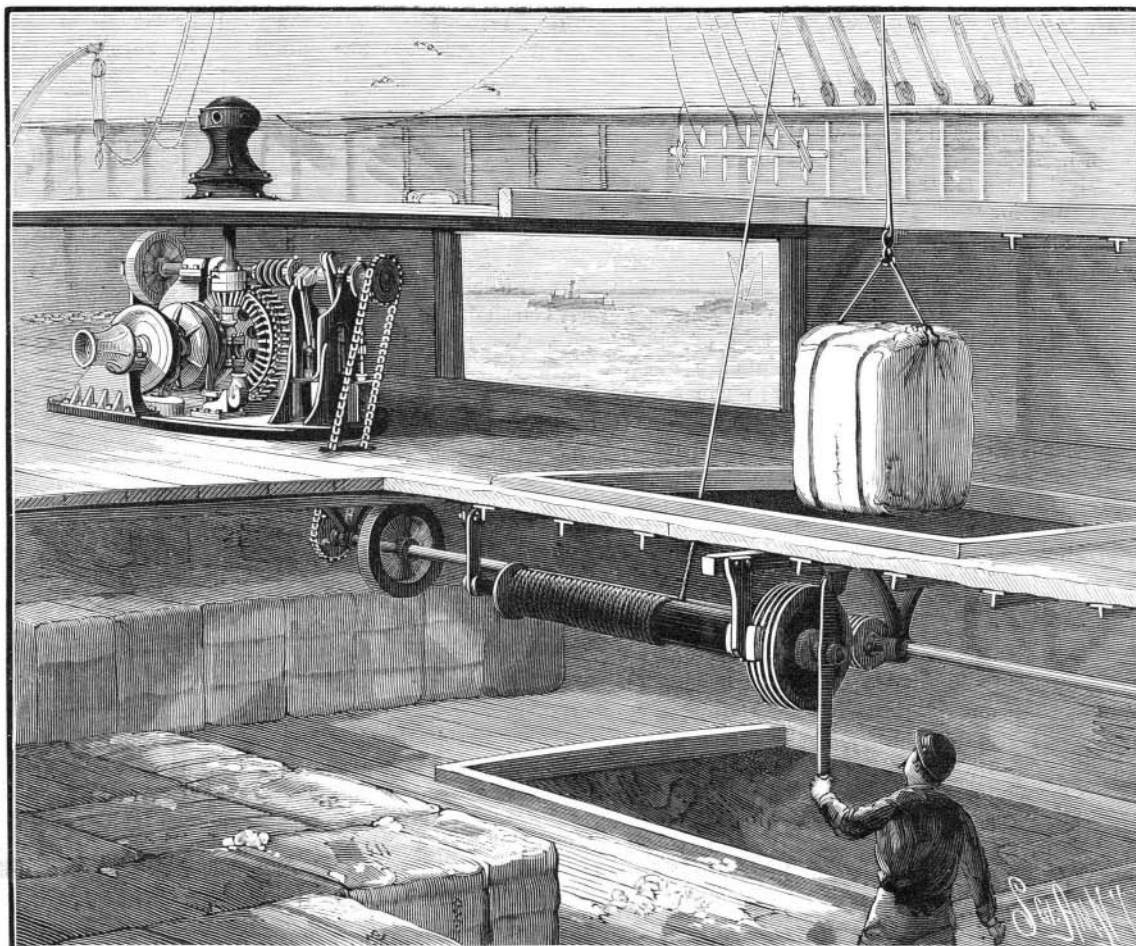
Decision in Favor of the Wheeler Wood Filler.

In the United States Circuit Court for the first circuit, at Boston, Colt, J., a final decree for an infringement and accounting was entered on the third Monday of February last, in the suit of the Bridgeport Wood Finishing Co. vs. Asahel Wheeler, in equity. This decree affirms the validity of the Wheeler patent, and restrains infringement thereof by the use of ground silex in wood fillers.

inner tube is of solid steel throughout, strengthened by jackets of comparatively thin steel hoops. The length of the bore is 487½ in., or about thirty calibers, and the rifling, which consists of a multitude of small shallow grooves, extends for 397.2 in., or about 33 ft. The diameter of the bore is 16¼ in. The diameter of the powder chamber is a trifle over 21 in., and its capacity 28,610 cubic inches. The twist of the rifling commences with one in 120 calibers, and increases to one in 56 calibers. The gun is mounted on a fine cast steel truck, which weighs 95 tons, and on the proof rounds it ran up the incline from about 50 to 70 ft.

The first round was fired with 600 pounds of Westphalian powder and a cylindrical projectile weighing 1,800 pounds. The velocity attained was 1,635 ft. per second, giving an energy to the projectile of about 35,240 foot tons for the penetration of armor. The second round was with a shot of like weight and 700 pounds of the same powder, being the largest charge as yet fired in England. The velocity attained was

1,843 ft. per second, the energy acquired being about 43,100 foot tons. The third round was with a similar projectile of 1,800 pounds and a powder charge of 800 pounds. The velocity attained was 2,007 ft. per second, and the energy rose to some 50,000 foot tons. The pressures of the gases within the chamber of the gun at the time of the powder discharge were 9 tons with the 600 pound charge, 12 tons with 700 pounds, and 15 tons with the 800 pound charges. The recoil of the gun in the last round was controlled by the hydraulic buffers within 4 ft. 6 in. The inner tube of the gun was in perfect condition at the termination of the day's firing. It is expected that when the next date of proof firing is determined, powder charges of 850 pounds, 900 pounds, 925 pounds, and 950 pounds will be used with projectiles of 1,800 pounds weight, and an energy on the projectile of 62,700 foot tons may be expected to be developed, capable of penetrating armor more than 3 ft. thick.



CONVERTIBLE ANCHOR AND FREIGHT HOISTING APPARATUS FOR VESSELS.