friction rollers at or near the heel of each davit, is to reduce the strain on the reel, and, consequently, on the lowering rope, so that the lowering of the boat can be easily managed by one man. After the lowering rope passes through the leader at A (Fig. 5), it can be led into the

Fig. 2

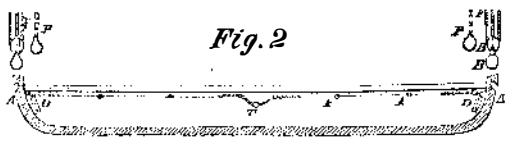


Fig. 3

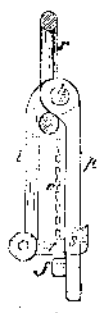


Fig. 4

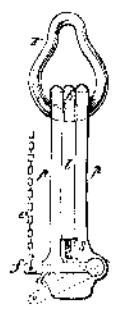
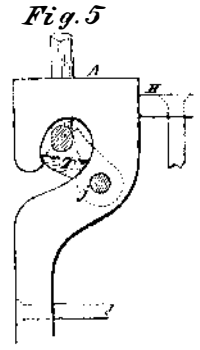


Fig. 5



boat, so that both the lowering and detaching can be done wholly by one man; but I consider it far preferable, from experience, that the lowering should be done from the ship, as here represented.

The Davidson Boat Apparatus was used on board the United States corvette *Dale*, on the coast of Africa, and has since successfully passed three examinations on board the United States practice ship *Plymouth*, at Annapolis, Md. Two boards of officers were ordered to examine this boat by the Honorable Secretary of the Navy; and a third, consisting of the Naval Committee of the House of Representatives, visited Annapolis for that purpose. It is now in use on board the United States steamer *Pocahontas*, in the Gulf of Mexico. The whole apparatus can be attached to any ship or any boat, and no particular kind of davit is required.

The following certificate proves the practical working of this apparatus:—

UNITED STATES STEAMER POCAHONTAS,
KEY WEST, April 7, 1860.

SIR:—I have the honor to inform you that, in obedience to your orders of the 6th and 12th of March last, I have several times, while at Norfolk and during our passage from Norfolk to this place, tested Davidson's boat apparatus for the purpose of quickly and safely lowering and hoisting boats at sea; and I have no hesitation in saying that my experiments justify me in pronouncing it to be one of the best things of the kind I have ever seen, and I recommend it for all boats in the naval service.

The quickest time I lowered the boat on board the *Pocahontas*, without any one apprehending my intention, was as follows:—

	h. m. s.	
Called away the boat's crew at	1.57.00	P. M.
Commenced getting ready for lowering	1.57.20	"
Ready for lowering	1.57.25	"
Commenced lowering	1.57.28	"
Boat in water (falling two feet) and detached from her tackling	1.57.31	"

At the time, we were steaming nearly seven knots per hour—sea rather rough, and weather pleasant; there were five persons in the boat, averaging, probably, 150 lbs. each, which, with the weight of the boat, oars, rudder and chair fixings, might be 1,600 lbs. When the boat was hooked on and hoisted up to the davits, the speed of the steamer was reduced to about three knots the hour. At the time, I ordered the boat's crew, called away the officers, appeared on deck and saw the performance, as well as on other occasions when it was not so quickly done, owing, probably, to the boat's crew feeling a little nervous, and carelessness in lowering the boat, but, as a general rule, I think the boat can always be manned, lowered and ready for service in one minute or one minute and-a-half, and certainly not to exceed two minutes. The boat is a light one, and now begins to leak from dropping one, two, and three feet into the water, so that a stronger boat would be more desirable if having to undergo the test of my "gig."

I trust, sir, that I have sufficiently answered the questions proposed in the copy of Mr. A. H. Evans' letter which the department forwarded to me. Respectfully, I have the honor to be your obedient servant,

S. F. HAZARD, Commander.

Hon. Isaac Toucey, Secretary of the Navy, Washington.

The patent for this invention was granted, Nov. 15, 1859; and further information in relation to it may be obtained by addressing the inventor, Lieut. Hunter Davidson, at the United States Naval Academy, Annapolis, Md.

BONNETS.

There is a change in the fashion of bonnets! The little "apologies" which have been sliding farther and farther back on the heads of our *belles*, have finally disappeared altogether. Their place is supplied, not by a huge deformity in the opposite extreme as many people anticipated, but by a queer-shaped hat peaked-up on top of the head, looking, for all the world, as if it were astonished at the strange metamorphosis which it has undergone. What a wonderful thing is fashion! The Empress Eugénie says to herself, "Let the world of women put on a new bonnet." And forthwith, the Queen of England, the Empresses of Austria and Russia, and the Queen of Prussia (all of whom look upon the *parvenu* empress with mingled feelings of aversion, fear and contempt), bend in this matter to her authority. And not they only, but without the aid of government couriers to circulate it, heralds to proclaim it, or constables to enforce it, the silent edict is borne by steamboat, by railroad car, by stage coach, by pony express, to all parts of the earth; and all women—from the wives of our merchant-princes, who recognize no one for mistress, who are not the subjects of any, and who have never looked upon the face of a superior, to the thousands who never heard of the name of Eugènie, scattered from the north-eastern borders of Russia to the valleys among the Australian mountains—hasten to render it prompt and willing obedience.

Ladies' bonnets are very interesting things—not only to the dear creatures who wear them, or the lovers who glance under them with such bewildering anxiety, but also to the fathers and husbands who pay for the wonderful fabrics. Did it ever occur to our readers that machinery and inventions could have anything to do with these delicate, fragile, airy, and (alas!) expensive articles? It is indeed so, and this is the culminating proof that we live in an age of machinery. Considering the universal interest in the subject, perhaps some of our readers would like with us to learn how ladies hats are made. Accepting the polite invitation of the great manufacturer of bonnet frames, R. T. Wilde, we yesterday visited his establishment at the corner of Broadway and Warren-street, in this city. Mr. Wilde employs 500 girls, and sends his thousands of bonnet frames to all the markets of North and South America. He has recently patented some improvements in the details of the manufacture, which he made no boast of as a brilliant effort of inventive genius, but which, he remarked, was satisfactory in its yield of pecuniary profits. Like most of the operations of the arts at the present day, bonnet frames are fashioned with a rapidity and an economy in the expenditure of labor which astonish one who beholds it for the first time. A square piece of foundation lace, properly starched or made stiff with a suitable gum, is placed upon a copper block of the shape of a bonnet, and is, by the foot of the workman upon a treadle, pressed up into a copper mold of corresponding form, which is heated and kept at the proper temperature by an ingenious device. Being held in this hot mold for an instant, when the block is withdrawn the lace is taken off, permanently pressed in the shape for a hat. A boy then trims away the unpressed edges, and the girls sew on the wire supports. It is in this wire arrangement that Mr. Wilde has made his improvement. He uses a very small iron wire, and has it wound very thick with cotton for the edge of the bonnet, which gives him a remarkably smooth and perfectly finished edge of uniform elasticity, which does not require the usual binding. Then his wires which run inward to support this edge are very delicate and covered with silk, so that the *Star Frame*, as he has named it, not only preserves its shape perfectly, but is remarkably light and elegant. Of course it is necessary to have a copper mold not only for every change of fashion but for every variety of form required, and we observed a block of plaster-of-paris in the process of being fashioned to suit some one of the thousand caprices of the fair multitude.

The great profitableness of Mr. Wilde's patent is a striking proof of the value of an invention which makes a real improvement, however small, in any article of extensive demand in the community.

DEATH OF A BALLOONIST.—Mr. Augustus M. Connor—a pupil of Professor Wise—lost his life on the 10th inst., at Palace Garden, in this city. The balloon dashed against the glass roof of the concert-room, on which he was thrown and so injured that he died soon after.

AMERICAN NAVAL ARCHITECTURE.

THE STEAMER "BENJAMIN DE FORD."

This steamer was constructed by the well-known builders, Messrs. Harlan, Hollingsworth & Co., Wilmington, Del., for the Merchants and Miners' Transportation Company, to run between the ports of Baltimore and Providence, *via* Norfolk, Va. As this vessel is claimed to be one of the best of its kind ever erected by those builders, we are of the opinion that the essential elements of its construction will be interesting to the readers of the SCIENTIFIC AMERICAN, and so proceed to give them in detail as follows:—Length on deck from fore-part of stem to after-part of stern post, above the spar deck, 213 feet 6 inches; breadth of beam at midship section, above the main wales (molded) 33 feet; depth of hold 15 feet 6 inches, depth of hold to spar deck, 23 feet 5 inches; draft of water at load line, 12 feet 6 inches; tunnage, 1,090 tuns.

Her hull is of wrought iron plates, 7-16ths and 13-16ths of an inch in thickness, and very securely fastened with rivets $\frac{7}{8}$, $\frac{3}{4}$ and $\frac{5}{8}$ of an inch in diameter, every 3, $2\frac{1}{2}$ and 2 inches. Distance of frames apart at centers, 16 and 17 inches. There are 12 fore and aft vertical keelsons, 20 inches in hight, continuing the whole length unbroken, all tapped off with angle iron, and the four center ones are boxed in, and are 9-16ths of an inch in thickness, the remainder are $\frac{1}{2}$ of an inch thick; four of these are situated under the engine, and are 4 feet in hight. The floors are shaped I (vertical); 20 inches in length, $\frac{1}{2}$ an inch in thickness; there are 14 cross floors of this hight and thickness, which continue up to lodger and clamp at the guard deck, forming belts and knees, joined to fore-and-aft keelsons with angle iron, capped the entire distance with same, and those under the shaft are boxed in. The shape of her keel is U, 7 inches deep and 13-16ths of an inch in thickness.

The *Benjamin De Ford* is fitted with one vertical beam condensing engine; diameter of cylinder, 56 inches; length of stroke of piston, 11 feet; diameter of paddle wheels, 30 feet; material of same, iron; number of blades, 26; width, 7 feet 6 inches; and their average depth is 1 foot 7 inches.

She is also supplied with one return tubular boiler, whose length is 16 feet; width 16 feet 7 inches, and 12 feet 8 inches in hight; location in hold; number of furnaces, 4; length of grate-bars, 7 feet 6 inches; number of arches, 4; number of tubes, 212; diameter of arches, 21 inches; diameter of tubes, 4 inches. The hight of smoke pipe, above grate surface, is 55 feet; its diameter is 63 inches; area of heating surface of boiler, 3,220 square feet.

The weight of her engine is 280,000 pounds; weight of boiler with water, 139,000 pounds; capacity of coal bunkers, 140 tuns. The boiler has a water bottom; and no blowers to furnace. The maximum pressure of steam is 25 pounds, cut off at $\frac{1}{2}$ stroke, and number of revolutions at this pressure, 20.

Her rig is that of a brigantine. She has three water-tight athwartship bulk-heads. The bunkers are of iron; her water-ways of wood, and she possesses one independent (extra size) steam fire and bilge pump, one bilge injection, and the ordinary bottom valves to all openings in her bottoms. In addition to these features she is amply protected from communicating fire by felt, iron, tin, &c.

GOLD INK.—Take some leaf gold and white honey and grind them together upon a marble slab until the gold is reduced to an impalpable powder. The paste now formed is agitated in a large glass tumbler with soft water, which dissolves the honey while the gold falls down to the bottom. The water is now poured off and the gold washed until all the honey is removed, after which the gold is dried and then suspended in a mucilage of gum arabic. It is now used for writing upon paper, and when it becomes dry it may be burnished and rendered brilliant. Silver ink is prepared in the same manner, by substituting silver leaf for the gold. Gold is also obtained in powder by dissolving nitro-hydrochloric acid (*aqua regia*), which is called the terchloride of gold. When crystallized, this is soluble in water, alcohol and ether, and may be used for gold ink by adding a gum mucilage to the water or alcohol in which it is dissolved. Metallic writing fluids of different colors can be made by mixing bronze powders in gum mucilage.