

THE HERRESHOFF TORPEDO LAUNCH.

A short time since we noticed this remarkable little vessel; we now present engravings of it, for which we are indebted to the London *Graphic* and *Engineering*. This launch, as will be remembered, was built in Bristol, R. I., for the English Government. It arrived in the Thames on New Year's Day, having crossed the Atlantic on the deck of the National Line steamer Denmark.

The boat, which is shown in section in Fig. 2, is 59 feet 6 inches long, by 7 feet 6 inches beam and 5 feet 6 inches deep, with 1 foot 3 inches draught of water, there thus being 4 feet 3 inches of freeboard. Her working draught, however, is 4 feet 6 inches, as the screw and rudder are both placed below the keel. The vessel is constructed with five watertight bulkheads, and her hull is of composite construction below the water line, having a steel framing covered with wood planking. The upper part of the hull is wholly of steel, the plates being one sixteenth inch thick, the top sides sloping inward, and the upper work forming a protective superstructure for the crew and machinery. She is propelled by a screw, which is placed beneath the vessel in a central position, and which is driven by a direct-acting condensing engine placed in the forward part of the boat.

The diameters of the steam cylinders are 10½ inches and 6 inches respectively, with a 10 inch stroke, and they are of 100 horse power estimated. There is an independent feed pump and air pump. The stoke hole is inclosed, and is supplied with air by a Sturtevant blower, which is driven by an independent engine of 2½ horse power. The propeller is a two bladed screw, 38 inches in diameter and 5 feet pitch, the screw shaft being 23 feet in length. The vessel is steered by means of a balanced rudder placed a short distance from the stern and under the ship, the helmsman being located in a stern cabin with a protected look-out raised just above the deck. The hull and machinery together

shown in section in Fig. 3, consists of a circular combustion chamber, which in the present instance is 4 feet in diameter internally, and within which is a coil of about 300 feet of 2 inch pipe, coiled to nearly the diameter of the chamber. This coil is continued at the top so as to form a kind of dome

the top of the separator, and returns through a short coil placed inside the combustion chamber, where it becomes superheated, and is led thence to the engines. It is claimed for this boiler that it cannot explode destructively, inasmuch as there is but a very small quantity of water in it at any time, and that it is distributed along the entire length of the coil. A rupture at any point would only be attended by a moderate blowing off of steam. The rapid circulation of the water is found to prevent the deposit of salts, the surplus water not converted into steam carrying with it all impurities.

One condition of the contract was that the hull should be strong enough to be slung from a ship's davits without bending or "springing," and the larger engraving represents the vessel being lifted by the big crane at the Victualing Yard, Deptford, fully manned and equipped, her weight in that condition being about eight tons. The First Lord of the Admiralty was present, accompanied by Admirals Hood, Wellesley, and Sir Houston Stewart, the Controller of the Navy, and Mr. Barnaby, the Chief Constructor.

The vessel was then lowered into the water, and steam got up in five minutes after lighting the fire. The great handiness of the boat, and her powers of rapid stopping, starting, and turning, were next shown. She was stopped from full speed in a distance of one third her length, and immediately went astern at a rate nearly equal to her forward speed. She then, at full speed, turned in complete circles of a diameter of three times her length, and this either going ahead or astern. Her guaranteed speed is sixteen knots an hour, and this, it is stated, she attained, with two tons of coal on board, on the occasion

of her official trial over the two knot course in Long Reach. Altogether the Herreshoff torpedo launch promises, from its powers of maneuvering and the great rapidity with which it can be got ready for sea, to form an important addition to

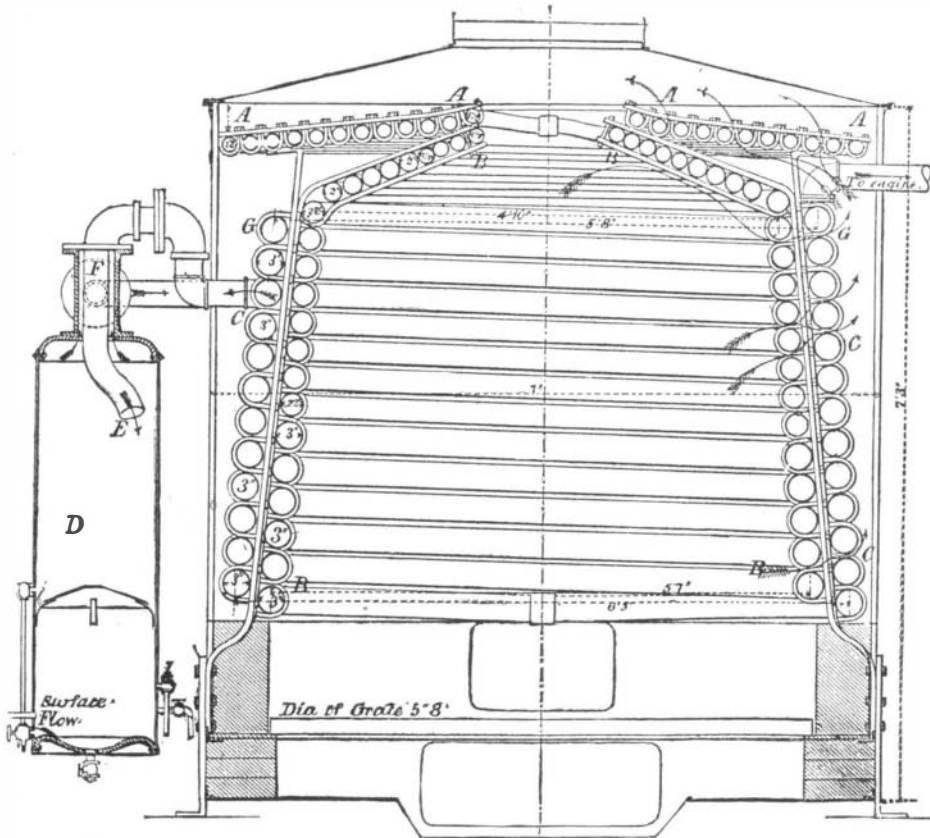


Fig. 3.—HERRESHOFF STEAM GENERATOR.

under the cover of the combustion chamber. By the side of the boiler is a separator, into which the steam passes before it goes to the engine. The water from the feed pump is admitted at the top of the coil, and during its course to the bot-

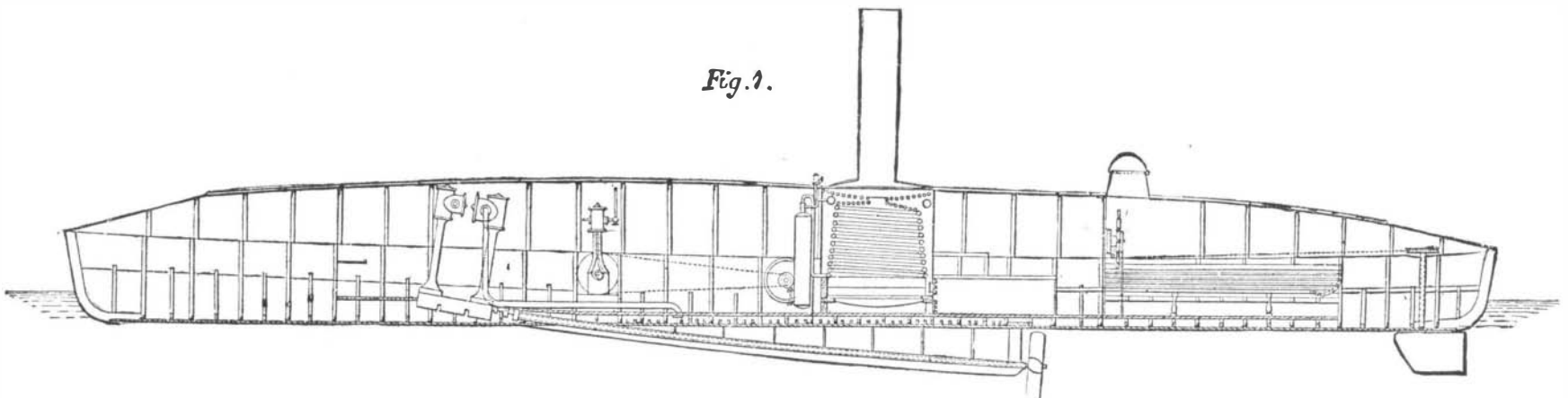


Fig. 2.—MACHINERY OF HERRESHOFF TORPEDO LAUNCH.

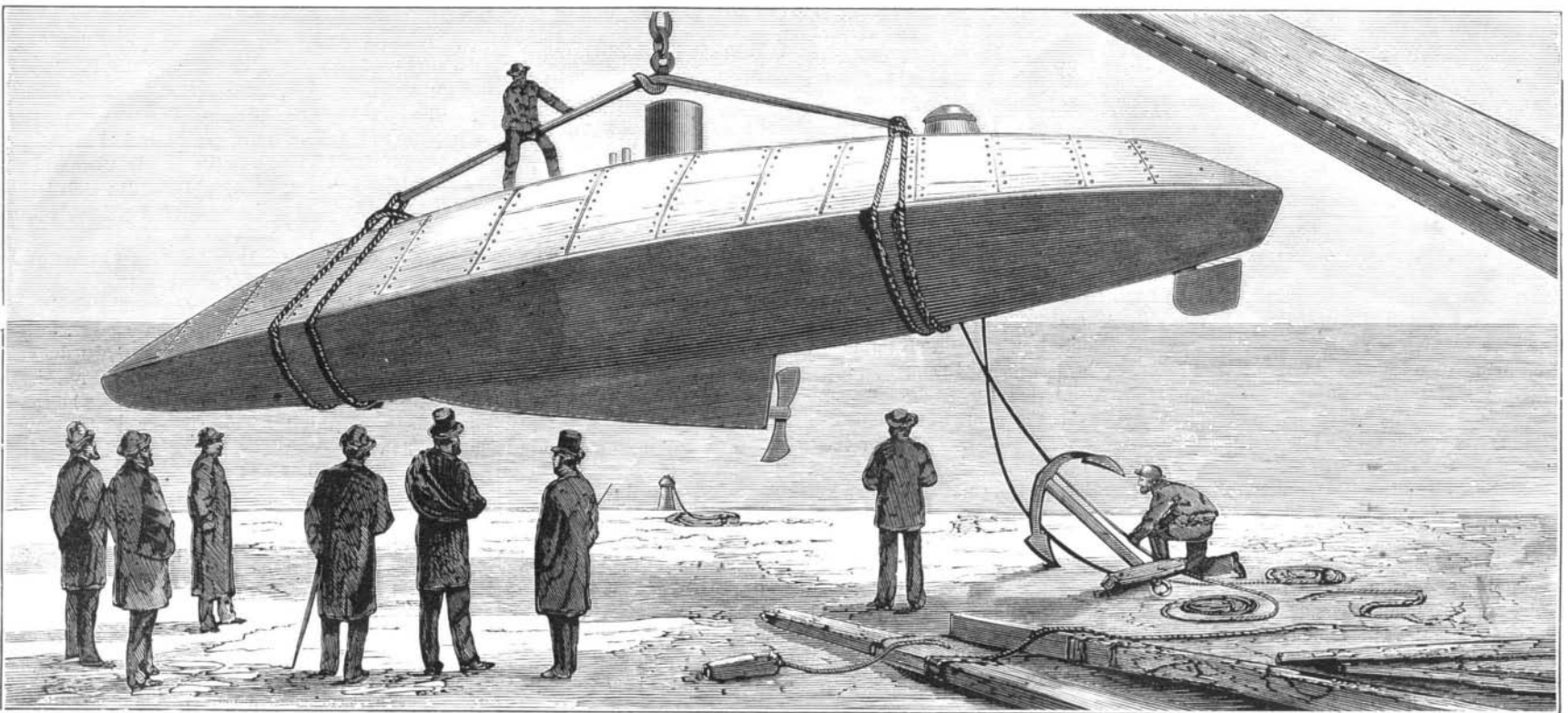
weigh 6 tons, but with the working crew of four men, and fuel, stores, and two torpedoes on board, the boat weighs about 7½ tons.

Steam is supplied by a Herreshoff coil boiler, which constitutes another novelty in this boat. The boiler, which is

tom the greater portion of it becomes converted into steam. Having passed through the entire length of the coil, the steam and water are discharged together into the separator, in such a manner that the water is entirely separated from the steam, and can be blown off as required. The steam is taken from

our naval resources, while its numerous special features give it particular interest from a mechanical point of view.

Dr. H. Briem proves that plants grow luxuriantly when their earliest stages are accelerated by heat.



THE HERRESHOFF TORPEDO LAUNCH, RECENTLY BUILT AT BRISTOL, R. I., FOR THE BRITISH GOVERNMENT.

Dangers to Railroad Brakemen.

Before the February meeting of the Car Builders' Association, Mr. D. A. Hopkins, one of the veteran railroad men of the country, related his experience as a freight train brakeman during his younger days, and described the perils to which this class of railway employes are exposed, especially in winter. They must run upon wet and icy running boards, and jump from one car to another in the darkness—a distance of from three to four feet. A single slip or a false step sends him to a horrible death. Statistics gathered as long ago as in 1852 showed that the proportion of men killed in this vocation on certain roads was greater than that of soldiers killed in ordinary warfare; and if railroad officers would give as much care to the protection of these men as they do the safety of passengers and freight, two thirds of the accidents that now occur might be avoided. As one means of prevention, the cars should be brought closer together. Another was by providing an iron upright guard around which a man might throw his arm while applying the brake, so that in case of the breaking of the chain, or slipping of the wheel, he could have something to hold on to.

According to the *National Car Builder*, Mr. Hopkins strongly urged the importance of well constructed cars. To secure this it was necessary that railroad companies should pay better prices for cars, so that builders could afford to use better material and workmanship. Contract cars, he contends, are apt to contain poor iron, cross grained wood, knotty sills, and other imperfections, which enhance the risks and dangers of train men; and in the matter of cost was poor economy after all.

A Victory for the Millers.

The United States Circuit Court decided the cases of the American Middlings Purifier Company against the millers of St. Louis, March 12, in favor of the defendants, on the ground that the reissued patent does not conform to the original, and is therefore invalid. The Minnesota cases follow the St. Louis cases. The plaintiffs will probably appeal to the United States Supreme Court.

AN IMPROVED LAWN MOWER.

The lawn mower, like many other machines, has passed through successive stages of improvement until it is now quite complete, besides being made at a reasonable price.

The accompanying engraving represents one of the improved machines made by Messrs. Lloyd, Supplee & Walton, of 625 Market street, Philadelphia, Pa. The points of difference between this and other machines of its class may be seen at a glance, and as it embodies some radical changes we will refer briefly to such as are considered improvements. Two independent driving wheels of large diameter are used, having as narrow faces as is consistent with the requisite power for operating the cutters. Each revolves independently of the other, on the same shaft, which also carries the driving gears. The wheels are connected with the shaft by means of a ratchet, so that the speed of the cutters is always governed by that of the wheel making the greater number of revolutions, which occurs in turning from the straight course, either in the return cut, or in avoiding obstacles. The machine is capable of cutting close to stumps or shrubbery without danger of damaging the cutters.

As will be seen by reference to the engraving, the cutting cylinder being of skeleton form is very light. The three wheels, having the necessary lugs for holding the cutters are made of malleable iron, the cutters being all steel, and bent and tempered in dies under hydraulic pressure, which gives them a uniform curve. A very simple adjusting device is applied to the cylinder, by means of which each end may be set separately to the cutter bar, and when once adjusted, is firmly secured in position. The cutters, as in other machines, are self-sharpening. A roller of small diameter follows the cutters, and receives sufficient pressure from the propelling power applied, to smooth the turf after the cut. The machine seems to be durable throughout. The independent wheels and the lightness of the moving parts render necessary but a very moderate expenditure of force in operating, and it is claimed by the makers to be the lightest mowing machine in use. Seven sizes are made, giving width of cut ranging from ten to eighteen inches.

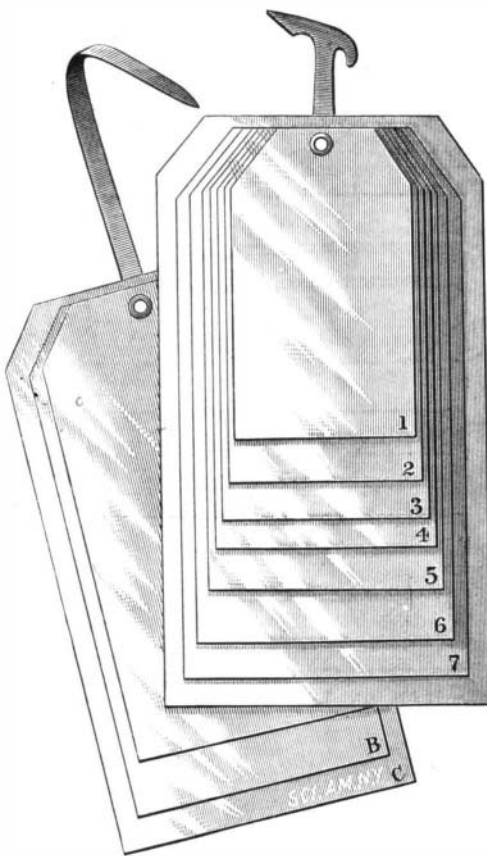
A Large Ocean Steamship.

The new Guion steamship, the Arizona, which was launched at Glasgow March 10, is the largest merchant vessel in the world with the exception of the Great Eastern.

Her length is not equal to that of the Inman steamship City of Berlin, but her carrying capacity is greater. She carries four masts, rigged like those of the Germanic and Britannic of the White Star Line, and two smoke funnels; has first and second cabins, each capable of accommodating 125 passengers, and registers between 5,000 and 6,000 tons.

A NEW SHIPPING TAG.

The accompanying engraving represents two forms of shipping tags, patented by Mr. John M. Goodridge, of Nor-

**GOODRIDGE'S PATENT SHIPPING TAG.**

folk, Va. One form is provided with a metallic barbed hook, and is designed especially for baled goods, such as cotton, bagging, hay, etc., and is said to be very popular in the South. The barbed hook is made of four cross tin, giving it ample strength to be thrust into the bale covers, and not break when doubled over the wire in the case of baled hay.

The long hook, or Universal Tag, as its name implies, is capable of universal application; the long tongue of tin may be readily wrapped about some portion of the article to be tagged, and is also in general use for marking phosphates and other goods in bags.

A purchaser is wanted for this patent and the entire ma-

this country. The first third of the collection comprised 2,619 lots, sixty-seven of which sold for more than \$100 each, and twenty-four for more than \$200 each. The part sold brought in all \$48,830, nearly one fourth of which went for the twenty-four works just mentioned. Among the more valuable of these were Captain John Smith's "Historie of Virginia, etc.," which went to the Lenox Library for \$1,800; a perfect copy of the first book published in America, "The Whole Booke of Psalmes," which brought \$1,200; the first edition of Eliot's Indian Bible, \$1,000; John Brereton's "Relation of the Discoverie of the North Part of Virginia," \$800; and other copies of rare and valuable books, which brought from \$700 down to \$200 each. To a very large extent the more valuable works of the collection were bought for public and society libraries, where they are likely to remain permanently.

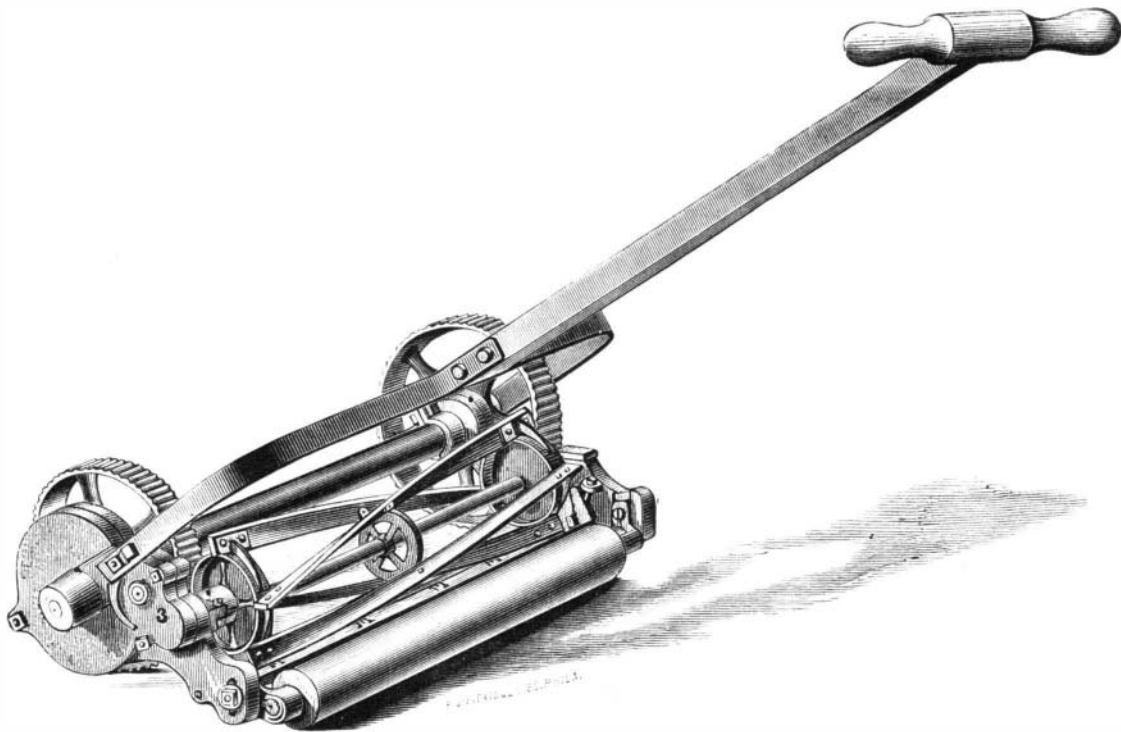
A Wisconsin Cranberry Marsh.

One of the largest cranberry farms in the world is known as Sackett's Marsh, near Berlin, Wisconsin. It comprises 750 acres of marsh, about one fourth of which is under cultivation. The yield has sometimes reached the enormous total of 35,000 bushels. According to a correspondent of the *Tribune*, this marsh is admirably fitted by nature for its present use, and its advantages of location could not have been improved upon by the experienced cranberry culturist. It is necessary to flood the entire surface during the winter, and this is rendered easy by the fact that the marsh is a basin lying in a wooded tableland, with an outlet at the lower end, across which has been constructed a dam 225 yards long and 4½ feet high, with double flood gates for regulating the height of the overflow. As soon as the crop is gathered the gates are dropped, and the marsh gradually becomes submerged by the autumn rains, the melting snows, and the drainage from the higher ground until it becomes a lake. This often freezes to a considerable thickness, furnishing a skating rink that puts to blush the contracted affairs of that name found in cities. In this manner the soil receives its only cultivation, and the tender plants are protected from the rigors of a Wisconsin winter. It is not uncommon for the marsh to be flooded eight or nine months in the year, the water not being drawn off until June.

The picking begins in October, when the inhabitants of the surrounding country turn out in a body for the work, not less than 3,000 pickers being employed at a time. The marsh is so wet and yielding as to preclude the possibility of driving teams across except on a corduroy road leading to the buildings in the center, where the gathered berries are cleaned and packed for market, and where the pickers from a distance are lodged and fed.

A movable wooden railroad track runs from the warehouse to the center of operations, and a car is loaded with the boxes of berries, each person picking into a pan, which is then emptied into his box of a bushel capacity. The pickers receive a ticket for every bushel loaded on the car, and on reporting to the superintendent at the close of the day, receive credit for the whole. The price paid is 75 cents a bushel, and the average day's work is not more than two or

three bushels, although it is not uncommon to pick five bushels, and a few experts have been known to pick seven bushels in a single day. The picking being often hurried on account of threatened approach of frost, a second picking is sometimes necessary, for which about a dollar a bushel is paid. The car, on being loaded with the filled boxes, is drawn by a team of horses to the warehouse, where the berries are hoisted on an elevator to the upper stories, and disposed of in such manner as to secure the best ventilation. The floors are covered with tier upon tier of boxes of berries, there being sometimes 20,000 bushels under the roof at one time. On the ground floor, large fanning mills are in motion, into which the berries are running from hoppers in the upper stories, and all leaves and other impurities are blown out, after which they are put

**PENNSYLVANIA LAWN MOWER.**

chinery used in the manufacture of these tags. For full particulars apply to Robert Baldwin, attorney at law, corner Fayette and Calvert streets, Baltimore, Md.

Rare Old Books at Auction.

The late Mr. George Brinley, of Hartford, Conn., a man of wealth and literary taste, spent many years and a large amount of money collecting rare books relating to the early history and literature of America. In some departments the collection was without an equal; and as a whole the library was the most important and valuable ever offered for sale in

in barrels and hauled to Berlin, and from there shipped to the Milwaukee and Chicago markets. A coopering establishment on the property manufactures the many thousand barrels which are annually required.

Mute Cattle.

M. Paul Bert, in a recent lecture at the Sorbonne, on the late Claude Bernard, narrated a singular stratagem which was invented by the latter during the last Franco-German war, and which might be utilized without difficulty under the same or even under different circumstances. It was