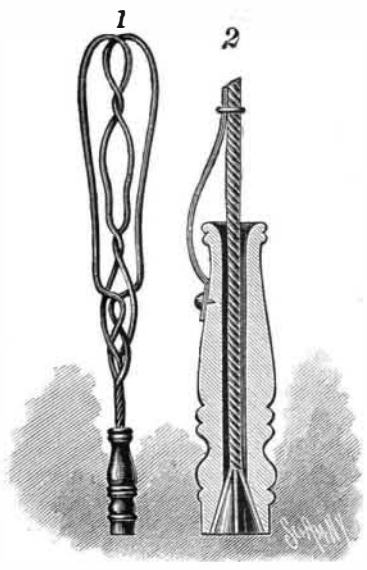
A NEAT AND EFFECTIVE CLOTHES BEATER.

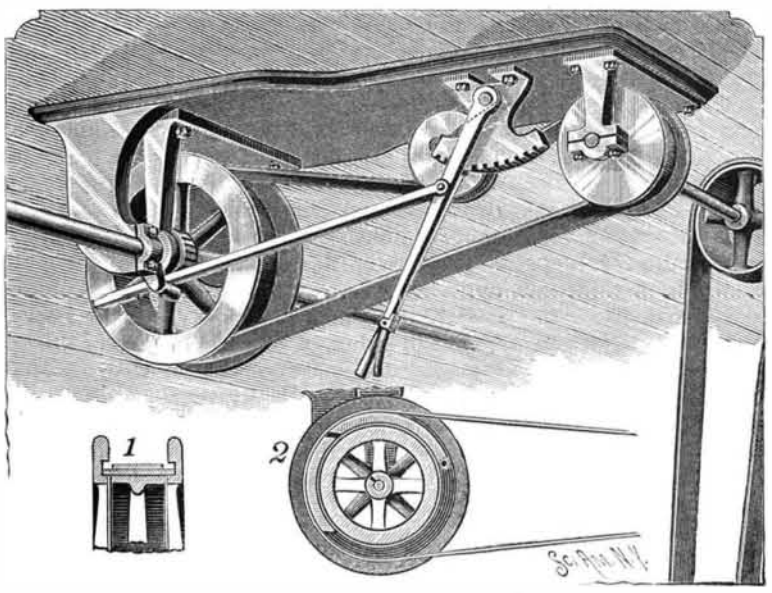
The illustration represents a light and simple device for switching or beating clothes, carpets, etc., which has been patented by Mr. Matthew Fitzpatrick, of Omaha, Neb. The beating portion of the implement is composed of two spring metal wires, bent and intertwined to form loops, as shown in Fig. 1. Near the handle portion the wires are twisted or braided to form a single body sufficiently long for insertion into the handle, shown in section, Fig. 2, and having a longitudinal aperture of a diameter greater than the twisted portion of the wires. The rear portion of the handle aperture is made flaring, whereby a plug may be inserted and driven to place between the separated inner ends of the wires to firmly fasten the beater portion to the handle. To assist in holding the wires in place and impart to them additional elasticity, a flat spring is held at one end by a screw or rivet to the handle and is attached to all the wires at its other end, near the point where the loop portion of the beater commences.



FITZPATRICK'S CLOTHES BEATER.

AN IMPROVED TENSION DEVICE FOR BELTS.

A device for attachment to any driving pulley, to dispense with the necessity of loose pulleys, and the use of a shifter in contact with the belt, is shown in the accompanying illustration, and has been patented by Mr. Anders G. Anderson, of Nestocton, Oregon. Fig. 2 shows a section through the drive wheel, and Fig. 1 represents the application on its periphery of a fender corresponding to about one-third of its circumference, this fender tying together disks loosely mounted upon the drive shaft at each side of the drive wheel. There is also a movable semicircular fender capable of sliding in the disks and upon the fixed fender, in connection with a friction pulley adapted for contact with the belt of the drive pulley, a lever being secured to the hanger of this pulley, with a pinion and rack attachment. To stop the revolution of the countershaft, the lever is thrown in the direction of the drive pulley, as shown in the illustration, throwing the hanger downward to such an extent as to elongate the belt. This movement of the lever also pushes forward a rod pivoted on the lever having rack teeth, which causes the disks at either side of the drive wheel to make a partial revolution, causing the two fenders to form a shield covering two-thirds of the drive pulley, whereby the belt is held out of engagement therewith.



ANDERSON'S TENSION DEVICE FOR BELTS.

RIFE'S AUTOMATIC HYDRAULIC ENGINE.

This engine (or ram) is very simple in its construction, and is designed to be kept in order at little or no expense. It is self-operating and constant in its action and has performed good work for elevating a continuous supply of water for irrigation, small towns, railroad tanks, factories, country residences, stock yards, etc. The engraving represents the size known as No. 30, weighing 250 pounds, and fitted for 3 inch drive pipe and 1¼ inch discharge pipe. One inch discharge pipe can be used where circumstances favor it.

On account of the raised base an automatic air feeder is drilled in the elevated base; this does away with taking off the air chamber to exhaust the air, which has to be done, when the old style is used, as often as once a month.

When working at full capacity, under an average fall of four to seven feet, the ram uses from 30 to 35 gallons per minute, but it is easily regulated to suit the flow from spring or stream to fifteen gallons per minute if necessary. Many of this kind are at work under various conditions, the fall on the ram varying from 15 inches to 15 feet, and forcing water from 15 to 250 feet high, and in some places to a distance exceeding one mile. For every foot fall this ram will elevate water twenty feet.

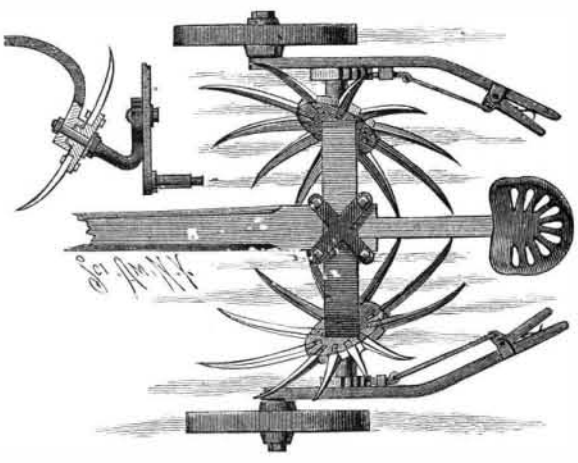
In Fig. 2 is shown the construction of the hydraulic engine, the air chamber being removed. The lower section or base is clearly shown, as well as the double-acting attachments, and how connected for properly delivering the spring water into the ram so that it may be forced, in a pure condition, by the power of the creek or river water, to any desired place. The spring water is conducted through the spring supply pipe, M, and check valve, O (which prevents its return), and is delivered into the base, B, directly under the delivery valve, which being removed shows the open end of the pipe from which the spring water flows, filling the entire elevated portion of the base with spring water, down to the place where the creek or river water discharges through the escape valve; so that when this valve closes, the entire force of the moving column of creek or river water through the drain pipe is exerted upon the spring water, driving a portion through the delivery valve into the air chamber, J, and is discharged through the pipe, P, to any required place. When the creek or river water has expended its force and recoils, a new supply of spring water promptly follows, replacing the portion just driven into the air chamber ready to be forced by the repeated action of the creek or river water.

The spring supply pipe, M, is provided with an overflow pipe, N, through which the spring water may momentarily escape when the check valve is closed, preventing any check or stoppage in the flow from the spring, being always ready to enter the ram and promptly follow the creek or river water the moment it recedes.

Additional particulars and an illustrated catalogue will be furnished free of charge by addressing Rife's Hydraulic Engine Manufacturing Co., Roanoke, Va., who are the sole owners and manufacturers.

AN IMPROVED POTATO DIGGER.

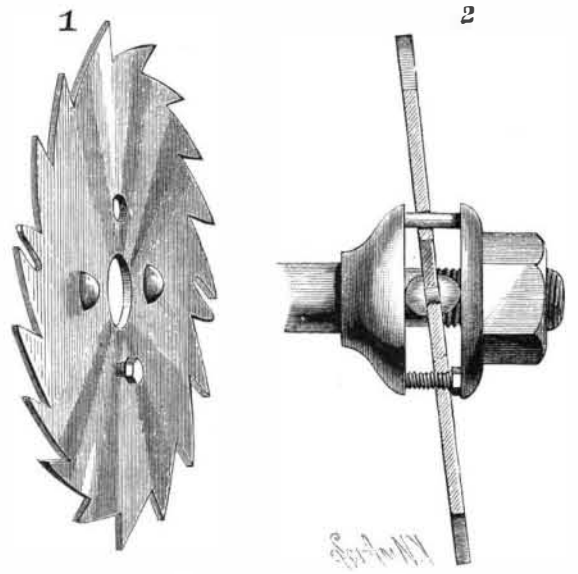
The illustration shows a plan view of a machine for digging potatoes and other vegetables, in which rotary forks are employed having radial tines adapted to occupy oblique positions in upward directions away from each other, while capable of being adjusted vertically. It is a patented invention of Mr. Charles H. Ayres, of Hightstown, N. J. The central portion of the frame is a saddle-like structure, secured by a clip to the draught beam, and united at its lower end on each side with a cranked arm, the inner end of each of which forms a pivot or axle for the rotary forks to turn upon, while their outer upturned ends have pivoted to them levers by which the main frame is raised or lowered to adjust the forks. The forward ends of these levers carry the axles upon which the running wheels turn. The small figure shows a partial sectional elevation of one side of the machine, illustrating its raising and lowering lever. The forks are thus adjustable also in backward directions toward each other, to gradually dig into the row from opposite sides and approach or come together in the rear, thus causing them to act as diggers and lifters and cleaners of the potatoes, and making the whole machine complete as a plow, without the aid of cultivator teeth in advance to break up the ground ahead of the forks.



AYRES' POTATO DIGGER.

AN IMPROVED WABBLE SAW.

The illustration represents a simple and efficient device by means of which the angle of the saw may be quickly changed and fixed. It is a patented invention of Mr. Lewis B. Rogers, of Mount Vernon, N. Y. Fig. 1 shows one side of a saw adapted for such



ROGERS' WABBLE SAW.

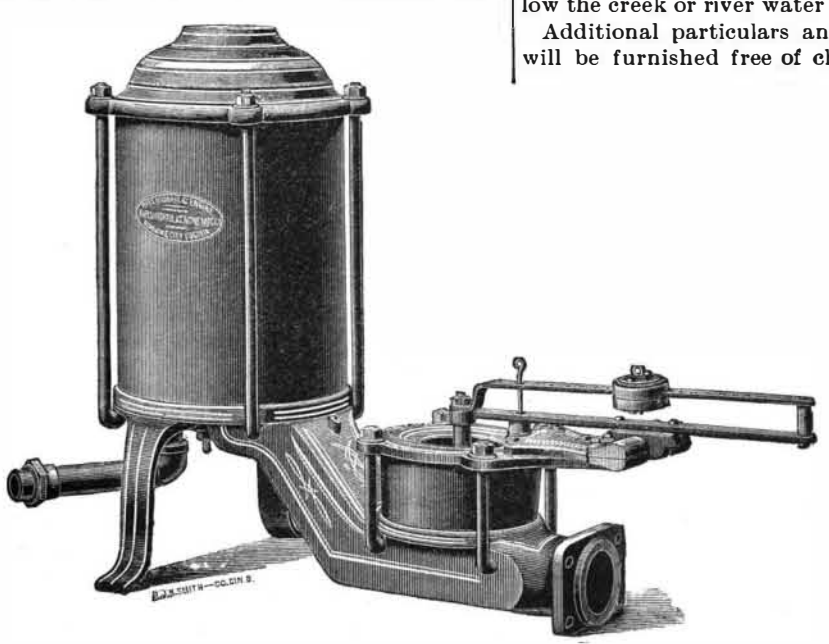


Fig. 1.—RIFE'S AUTOMATIC HYDRAULIC ENGINE.

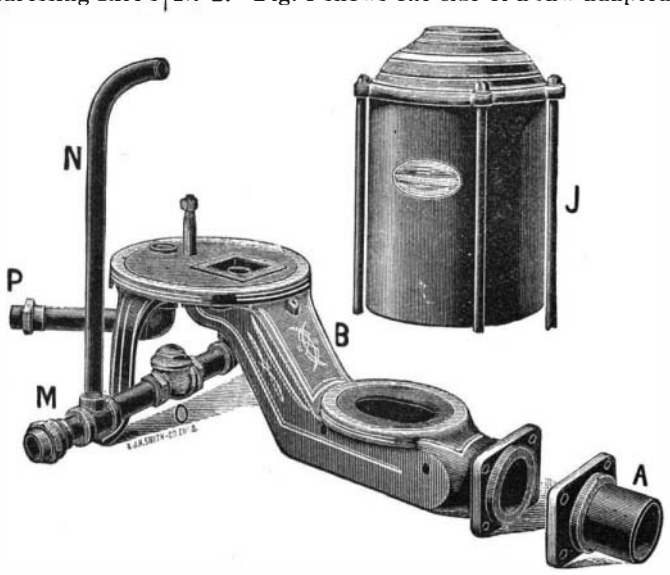


Fig. 2. RIFE'S HYDRAULIC ENGINE DISCONNECTED TO SHOW CONSTRUCTION.

use, and Fig. 2 is a vertical cross section of the saw mounted upon a mandrel between two collars. The mandrel has a screw thread which extends nearly to the saw, with an outside washer or collar, and a nut to hold the latter in position. Fixed in the saw plate on each side, or integral therewith, are projecting knobs adapted to bear against the collar and the washer near their outer edges, these knobs being opposite to each other, and acting as pivots upon which the saw may be tilted. At right angles with the knobs, and at about the same distance from the center of the saw, are bolts of equal length projecting through the saw plate. One of these bolts may be simply a pin, fitting loosely in a hole in the saw plate, and its ends bearing against the collar and washer, but the other bolt has a screw thread fitting a thread in the saw plate, and has a flat-sided head to which a wrench may be applied. When the saw is placed in position on the mandrel, the outside washer is forced firmly against the ends of the bolts and knobs, by means of the outer nut, and the angle of the saw is then readily changed by turning the screw threaded bolt which engages the screw-threaded aperture in the saw-plate.

Naphtha Locomotives.

The Bellefontaine Street Railway Line, of St. Louis, have concluded to give what is known as the Connelly gas motor a fair trial. This is a motor first put into use in Elizabeth, N. J. One motor was run over six months experimentally, developed abundant power for the heaviest loads and a speed of 12 miles per hour, but there were many mechanical defects which had to be overcome. Two new motors were constructed, every improvement being tested by actual service on the road, and it is claimed that the experimental stage is now passed, and there is no longer any doubt as to the new motor's success. Preparations are being made to manufacture the motors in Chicago and Elizabeth, and possibly in St. Louis.

Upon first thought it would seem to be an easy thing to attach a gas engine to a street car, but, in fact, it has been a very difficult problem, owing to the lack of a suitable appliance for transmitting power from the engine to the car axle differentially. A gas engine geared direct to the car axle as the locomotive is connected to its driving wheels would require an engine of such bulk and power that it would be entirely impracticable. A gas engine of 25 h. p. has been applied to this purpose, geared direct, and proved an entire failure. It completely failed to start a street car on a grade or a curve. The usual mechanism furnishes direct transmission of power, but this practice conveys the least power just at the time when the greatest power is required. The most power is needed when a car is starting or on grades. It was evident that a variable transmission, permitting the engine to develop its maximum power when starting or driving a car at minimum speed, was the one essential thing needed for a gas motor. The Connelly motor is said to encompass this desirable point. An ingenious piece of mechanical workmanship is used to cover the requirement. It is called a friction device, that exerts a powerful leverage, enabling an 8 h. p. engine to easily start a loaded car on grades, which could not be started by a 30 h. p. engine connected to the axle in the common manner. The compound gas engine has high and low pressure cylinders. The fuel tank is a double cylinder, the inner one containing the naphtha and an absorbent material. This is surrounded by a jacket of water, which is connected by pipes to the water jacket about the engine cylinder. The circulation of water from the cylinder to the carbureter is continuous, and it performs a double service, cooling the cylinder of the engine and warming the naphtha, producing evaporation. Air is drawn through the absorbent material, thoroughly carbureted, and supplied to the engine, compressed, and then ignited by an electric spark. The low pressure cylinder next receives the charge and becomes a motive cylinder during the first half of the outward stroke, when, the pressure being gone, it acts as a pump, drawing a fresh charge of gas into the high pressure cylinder. The method of transmitting power from the engine to the axle is quite practicable. The main shaft is set parallel with a disk 30 in. in diameter placed on the face of the fly wheel. On the shaft is a loose friction pulley 12 in. in diameter, that engages with the face of the disk. This loose pulley is prevented from revolving on the shaft by a tongue and groove, but it is moved up or down on the shaft at the will of the driver, by means of two screw rods which pass through the pulley and revolve with the shaft.

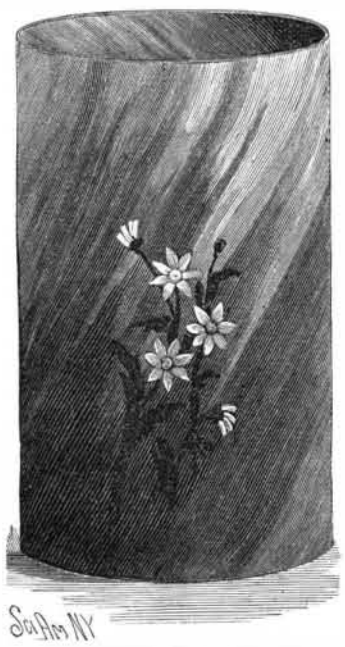
When it is required to slow up or stop, the friction pulley, still in contact with the disk, is run down to near its center, and at this point can be slightly lifted from the disk. To reverse, the friction pulley is run below the center of the disk, while the engine is left to run all the time in the same direction. The engine, it is said, requires no attention after being started, and regulates its own speed, whether the car be running or standing still. The car is started with a gentle motion and with an enormous leverage.

The cost of operating the gas motor is $1.40 per day, 14 hours, 90 miles each, while the cost of operating street cars with horses averages from $5 to $6.50 per day for each two horse car, the average mileage being 60.

The motors are now being constructed, with latest improvements, in Elizabeth, N. J.—*L., H. and Power.*

IMITATION OF MAJOLICA.

Cements and sealing wax are useful for giving to paper and wooden articles a hard glaze, resembling that of majolica ware. The cylindrical vase shown in the annexed engraving consists of a paper mailing tube 3 inches in diameter and 6 inches long, furnished with a pasteboard bottom, which is glued in. The inside and bottom of the vase is provided with two or three coats of asphaltum or shellac varnish to render it waterproof. The outside is covered with jeweler's cement of different colors, or with sealing wax, or both. The bar of cement or wax is melted at the end, and applied to the paper cylinder in the same manner as it is applied in sealing packages. No particular care is required in applying the wax. It is, however, necessary that the edges of adjoining patches of wax be brought into contact with each other to insure the complete covering of the paper. In the example shown in the engraving, olive green jeweler's cement forms the covering of the lower part of the vase. This is blended into cement colored with Venetian red or Indian red, and the cement at the top is flecked with yellow.



IMITATION OF MAJOLICA.

The mass of cement is laid on in spiral lines, and when the covering is complete, the vase is held over a smokeless flame, such as that of a Bunsen burner or alcohol lamp, or it may be held over a coal fire until the cement fuses. The vase should be turned in such a way as to cause the variously colored cements to run into each other. The vase is held by means of a paper tube or a stick inserted in its open end.

Ornamentation may be applied by cutting leaves, stems, petals, etc., from pieces of thick paper, dipping them in melted cement of appropriate color, allowing them to cool, afterward arranging them upon the vase; finally softening the cement of the vase and the ornament by holding a flame or a hot iron over them until the cement softens, and the ornaments are attached. Care is required at this point to avoid the complete fusing of the cement, as this would spoil the job. Care is also required to avoid igniting the cement or wax, as it is nearly impossible to extinguish it.

How to Prevent Scarlet Fever.

At a recent meeting of the American Pediatric Society in New York, Dr. J. Lewis Smith, the president of the society, read a paper on a part of the general discussion on "How to Prevent Diphtheria and Scarlet Fever." The micro-organism of scarlet fever had not been positively ascertained, but its effects were known from clinical observation. The contagiousness probably did not cease until after desquamation had passed, and it had been said the discharges from the otitis due to it were contagious. Quarantine in a small room attached to one of the wards at the Foundling Asylum in this city had been sufficient for scarlet fever, but not for measles. The contagious element was more fixed and less diffusible in the former. It remained in clothes a long time. Most prophylactic measures consisted in isolation of the patient, disinfection of the person and air which surrounded him, and of objects and persons in close relation with him. He called particular attention to the danger in books handled by the sick with scarlet fever, for in them the contagious element remained a long time. At his first visit he wrote a prescription for carbolic acid and oil of eucalyptus, of each one ounce; spirit of turpentine, six to eight ounces; mix, add two tablespoonfuls to a quart of water, put in a broad basin and maintain a state of constant simmering over an oil stove. He also ordered an inunction of the entire surface of the patient every three hours with carbolic acid and oil of eucalyptus, each one drachm; sweet oil, seven ounces. A solution of corrosive sublimate might with advantage be applied on a probe and cotton to the tonsils and pharynx, and ten drops of a solution of two grains to the pint syringed into the nostril every two hours in the young infant. Then there should be constant ventilation during the active period of the fever, no article should be sent from the room unless properly disinfected, new families not allowed to move into the apartments before proper disinfection, the physician should disinfect his hair and entire person, and not wear the same outer clothing when going to see midwife cases.

The Plate Glass Industry in the United States.

The growth of the plate glass industry in this country has been such that one is forced to regard its manufacture as one of the most prosperous industries in the United States. It is a question, however, one which time alone can answer, whether it will continue to be such a prosperous industry, rise being given to the question by reason of the large increase of capacity projected. There are already eight great works in operation, viz.: Crystal City, Duquesne, Creighton, Tarentum, Ford City, New Albany, Kokomo, and Butler, capable of making from 9,000,000 to 10,000,000 square feet of glass per annum, according to recent estimates, or almost as much as the present requirements of the country call for. What, then, is to become of the heavy additional production promised is not known, without lower prices for the article can greatly augment consumption. But work on new plants and additions to old ones is going on just the same, nevertheless. At Charleroi, the newest industrial city of Pennsylvania, a huge plate glass establishment is being erected, and will be equipped with glass machinery, at a contract cost of $308,000. The Diamond Plate Glass Company, of Kokomo, Ind., through a branch $2,000,000 incorporation, is putting up a works at Elwood, Ind., to make 20,000 feet of finished glass a day and to give employment to about 2,500 men. The Pittsburg Plate Glass Company propose doubling their present plant at Ford City, at any outlay of $1,750,000, so as to surpass all competitors in the matter of output, at home or abroad. Other companies still are enlarging, and entirely new enterprises of the kind are being either actually organized or talked of in various parts of the country.—*Wheeling Manufacturer.*

The First Locomotive Manufactured in South Australia.

The town of Gawler was all alive on Friday, April 11, when the first locomotive made by the enterprising firm of James Martin & Co., limited, was formally handed over to the railway commissioners. A special train left the city at 9:30, conveying a large number of the commercial world, including the premier, members of Parliament, and his Excellency Earl Kintore. On arrival visitors found the town gayly decorated. Several arches of bunting and evergreens, with a great number of flags and other decorations, gave a most pleasing appearance.

After several hours spent in looking over the works, which were in full swing, a banquet on a very liberal scale was provided. The speeches on this occasion were all well received, especially those of his Excellency, the premier's and the venerable James Martin's. Afterward, when the engine was formally handed over, a model of the regulator handle in silver and an illuminated address were presented to Mr. James Martin, and his reply evidenced how well he appreciated the thoughtfulness of his many old and new servants in making the presentation.

Before returning to the city the governor drove the engine and a number of carriages containing the Sunday school children and many residents several times up and down Murray Street, and this will be to many one of the events of their lives. Indeed, to be driven by a real live earl is the happy lot of few.

Although Messrs. James Martin & Co., limited, of Gawler, have been long and favorably known in connection with their extensive mining and agriculture manufactures; the recent substantial additions to their buildings and plant and the increase in the number of their employes is due to their having accepted the contract to supply locomotive engines to the South Australian government. The contract was signed on May 1, 1888, and provides for the supply of fifty-two locomotives, to be delivered by installments covering a period of seven years from the date of contract.—*Pictorial Australian.*

Look Out for Your Ashes.

It would appear that the cause of the accident on board the City of Paris was the breaking of the propeller shaft, which caused a sudden increase in the velocity of the engines, leading to a general smash-up. The breaking of the shaft was due to its having ground away the lignum vitæ, and ultimately the steel in the strut supporting it. It then was out of a straight line, and in consequence of this broke by the strains brought about by its own revolution. The cause of the accident is, therefore, to be traced to the grinding away of the lignum vitæ of the bearing. One theory is that the liner on the propeller shaft being too tightly shrunk on, split, thus leaving a sharp edge to grind away the lignum vitæ. Another is that the ashes which are discharged below water on the same side as the broken shaft were continuously carried to the propeller bearings as the ship was going through the water, and that they were the original cause of the mischief. —*Nautical Magazine.*