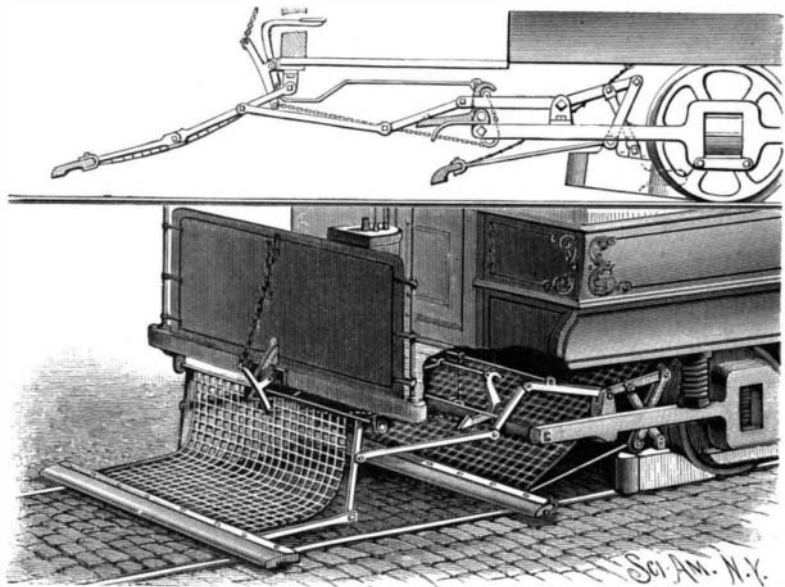


**AN IMPROVED CAR FENDER AND BRAKE.**

The illustration represents a fender with auxiliary brake mechanism so connected that both are released and moved into operative position at the same time, either by the motorman pressing his foot upon a lever or by an obstruction in the path of the car. The improvement has been patented by Mr. Paul M. A.

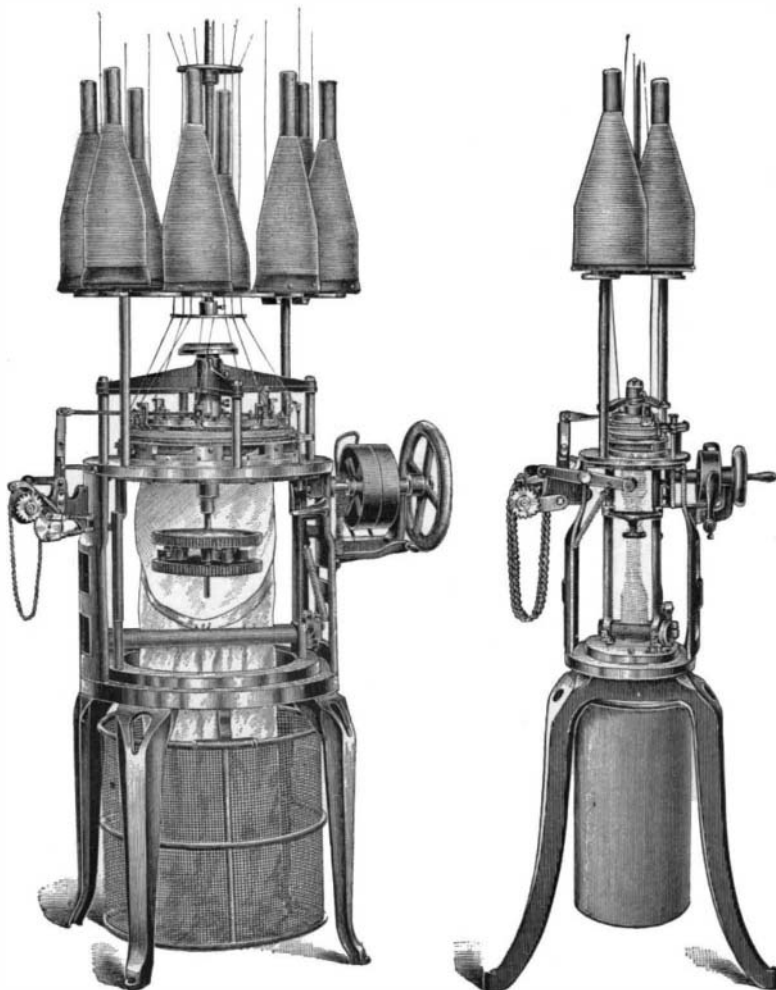


STEMMLER'S CAR FENDER AND BRAKE.

Stemmler, of Walden, N. Y. The principal view shows the fender down in position to pick up an obstruction in the path of the car, while the other view represents the fender and brake in inoperative position. The fender has side arms pivoted on brackets on the under side of the platform, the lower ends of the arms being pivotally connected with other arms by a cross bar carrying a strip of flexible material adapted to ride on the rails. A netting is attached to the side arms, and they are also pivotally connected by links with a brake shoe adapted to engage the tread of the rail. The brake shoes are also pivotally connected with the side arms of a second fender in the rear of the first one and directly in front of the car wheels. On each side of the car are levers pivotally connected with the brake shoe, and also connected by a link with a foot lever on the car platform, by pressing upon which the motorman or gripman may bring the brake shoes down to engage the rails and the tread of the wheels, at the same time swinging the fender down. When the operator does not see the obstruction, and it strikes the cross strip and bar of the front fender, the levers are also automatically released to move the fenders and the brake shoes into their lowermost position, the fender to pick up an obstruction and the brake mechanism to stop the car.

**IMPROVED KNITTING MACHINERY.**

The illustration represents a new circular ribbed knitting machine for making ribbed underwear, plain or fancy, royal ribbed Cardigan jackets, sweaters,



THE STAFFORD RIBBED UNDERWEAR MACHINE AND SHIRT SLEEVER.

skirts, caps, and jerseys. It is manufactured by Messrs. W. Stafford & Company, Little Falls, N. Y., and has an entirely new automatic take-up. It is of the spring type, worked by an eccentric driven by an increased gear cut on the bed plate of the machine, making a neat, direct-acting arrangement, very sensitive in adjustment and positive in action. The machines are also made with a weight take-up that is very simple and durable, being actuated by a worm gear and wheel which insures smooth and even motion.

Stationary bobbins are employed, making it possible to use the most perfect of stop motions, and the single chain and lever operates the dial cams. The cam rings and plates are made with the cams for each feed on separate segments, so that they can be readily removed without disturbing the needles, while being perfectly rigid when in place. The dial cams can be set in any combination for fancy stitches, and the cylinder draw cams are made to be easily drawn up or out, if desired. The dogs are adjustable from the outside without interfering with the cloth, and have a rolling contact which does not leave a mark. Great care is taken in the design and construction of these machines and all parts are interchangeable, so that duplicate pieces can be obtained at any time to replace parts which may be worn or broken.

In the ribbed shirt sleever the cylinders and dials, as in the larger machines, are of solid hard steel forgings. The cam ring is sectional, and the cams are of cast steel, ground after tempering, the cam system including the latest improvements. By a recent modification the lengths and changes are obtained without the use of chains, by a very easy adjustment, and the machine knits the arm, cuff and welt with or without slack course and widening attachment for arm, the operation being entirely automatic.

This company has facilities for designing and building knitting machines of all kinds, and fixtures to be used in connection therewith, as well as machines for making cut hosiery, mittens, etc. The knitting machines are fitted, if desired, with an electric stop motion, which has proved very convenient and reliable.

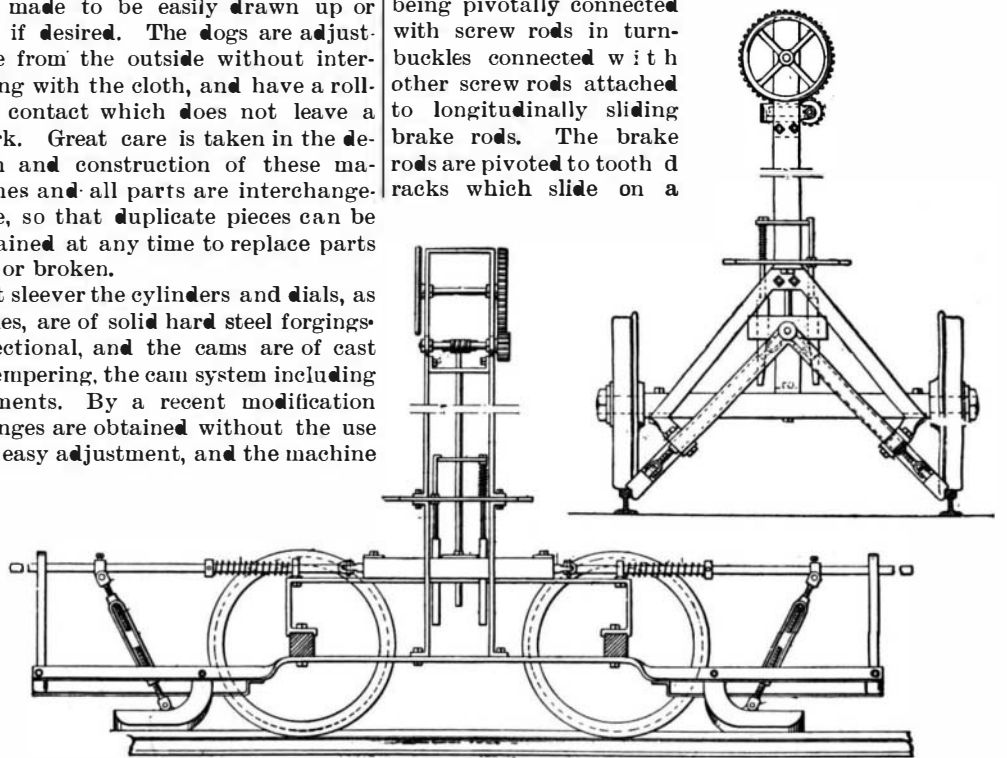
**Cultivating Sponges.**

Sponge farming has been found to be a very profitable industry, and at present there are hundreds of acres in the Gulf of Mexico, along the Florida coast, devoted to this novel purpose. The attempt to grow sponges was first made when it was discovered that the sponge fisheries of the Bahamas and the gulf coast of Florida showed signs of becoming exhausted. It has since been found that under proper cultivation sponges may be raised which are superior in quality and command higher prices than those found at sea. The site for a sponge farm is usually some arm of the sea where the salt water flows in freely. The only preparation necessary is to drop in rocks, stones, and other substances for the sponges to fasten themselves to and to dam up the lagoon so that the sponge seeds cannot be blown out to sea. The farms at first obtained their supplies of sponge seeds from the Fish Commissioners, but latterly they obtain them directly from the sponge fisheries. In the autumn of the year the various varieties of sponges are purchased by the sponge farmer, care being taken to secure both the male and female cells. The sponge seeds are generally kept in small "pounds" during the winter months, and here the masses of protoplasm develop and grow. The spores are liberated early in the spring. They swim about, the eggs grow rapidly and soon attach themselves to the rocks or coral at the bottom of the water. The sponge farm requires little attention after it is once started. The sponges grow slowly, and, as a rule, none are pulled

up till the end of the third year. The largest sponges are then gathered and the smaller ones are left to produce new seeds and grow to a larger size. The sponges may be readily gathered on sponge farms, since the water is usually shallow and smooth, and the dangers of ordinary deep sea sponge fishing are not encountered. The finest sponges raised in this way are said to sell for from \$1.50 to \$3 per pound. If no diseases or enemies get into the sponge beds, the sponges yield large crops year after year. The yearly income from the sponge farm is said to range from \$1,000 to \$10,000, according to its size, location, and age.

**AN IMPROVED CAR BRAKE.**

The illustration represents, in side and end views, a simple but very powerful brake recently patented by Mr. Frederick L. Desmoineaux, of Lawson, Col., in which the brake shoes are applied to the rails instead of to the wheels. Extending longitudinally of the truck is a frame between whose flat side pieces are pivoted swinging shoes, adapted to swing downwardly and outwardly to engage the track rails, the shoes being pivotally connected with screw rods in turn-buckles connected with other screw rods attached to longitudinally sliding brake rods. The brake rods are pivoted to tooth d racks which slide on a



DESMOINEAUX'S RAIL BRAKE.

plate fastened centrally to a truss, and the rods are spring-pressed to hold the shoes out of engagement with the rails, but by pressing upon a foot piece the shoes are swung firmly against the rails. By turning a hand wheel, also, the brake shaft may be turned with great power to firmly set the brakes.

**Height of Ocean Waves.**

Dr. G. Schott, as the result of studying the form and height of the waves of the sea, claims that under a moderate breeze their velocity was 24.6 feet per second, or 16.8 miles an hour, which is about the speed of a modern sailing vessel. As the wind rises, the size and speed of the waves increase. In a strong breeze their length rises to 260 feet and their speed reaches 360 or 364 feet per second. Waves the period of which is 9 seconds, the length 400 or 425 feet, and the speed 28 nautical miles per hour, are produced only in storms. During a southeast storm in the southern Atlantic Dr. Schott measured waves 690 feet long, and this was not a maximum; for in latitude 28° south and longitude 39° east he observed waves of fifteen seconds' period, which were 1,150 feet long, with a velocity of 78.7 feet per second, or 46½ nautical miles an hour. Dr. Schott does not think that the maximum height of the waves is very great. Some observers have estimated it at 30 or 40 feet in a wind of the force represented by 11 on the Beaufort scale (the highest number of which is 12); and Dr. Schott's maximum is just 32 feet. He believes that in great tempests waves of more than 60 feet are rare, and that even those of 50 feet are exceptional. In the ordinary trade winds the height is 5 or 6 feet. The ratio of height to length is about 1:33 in a moderate wind, 1:18 in a strong wind, and 1:17 in a storm; from which it follows that the inclination of the waves is respectively about 6°, 10°, and 11°. The ratio of the height of the waves to the force of the wind varies greatly.

**A Fast Torpedo Catcher.**

The Bruiser is the latest addition of the torpedo destroyer class to the British navy. She is 201 feet 6 inches long, 19 feet wide, 13 feet deep, 7 feet 4 inches draught, 220 tons displacement, 4,156 I. H. P. Polished propellers having three blades. On her recent trial in boisterous weather the mean speed of six mile runs was 28.14 knots per hour. The speed for three hours was 27.97 knots.

**Hadfield's Projectiles.**

In some recent trials, projectiles manufactured by Hadfield's Steel Foundry Company, Limited, have been very successfully tested by the government officers at Shoeburyness. Out of 290 projectiles forwarded two were selected for trial at plates of Cammell's make, 9 inches thick and 4 feet square. The first shot was fired at 155 yards range, the striking velocity being 1,873 feet and the striking energy 2,468 foot tons. In the second case striking velocity was 1,897 feet and the striking energy 2,532 foot tons. In each case 48 pounds of powder was used. The first shot penetrated the plate and was recovered whole, the impact being 0.036 inch. The projectile was uninjured. The second shot behaved in a similar manner; but the point was broken off. On these trials the whole consignment was approved as satisfactory, and accepted as according to specification. Another similar consignment has also been accepted by a foreign government. The difficult nature of the trial may be gathered from the fact that the face of the plate against which the experiments were conducted contained 1 per cent carbon. Occasionally the facing ran as high as 1½ per cent. Some little time ago the company supplied the government with an order, and one of their ordinary 6 inch projectiles, taken out of stock at Aldershot, was fired through a 9 inch plate and was recovered uninjured. The projectile was put a second time into the gun, and again went through a 9 inch plate. A third time the shot, after being ground up, was put into the gun, and fired against a hardened plate, and was only then broken up. Some time ago one of Hadfield's shot, with specially shaped head, was fired against a 6 inch Harveyed plate of the latest type. The ordinary projectile of chilled iron would have been entirely broken up; but Hadfield's special design penetrated the 6 inch plates, thus showing that the Harveyed armor is not so invulnerable as it is supposed to be.

**Manufacture of Smokeless Powder.**

The wood fiber, which is the basis of Schultze powder, is purchased in a form resembling coarse blotting paper. It is cleaned and torn up into shreds until as light and fluffy as cotton wool, and dried. A certain quantity of this fiber is weighed off and passed into the nitrating house. Into each tank is placed a mixture of strong nitric acid and sulphuric acid. While the former of these chemicals enters into the composition of the explosive, the latter is only there for the subsidiary purpose of absorbing the water that is formed in the main chemical process, which begins the moment that the wood fiber is introduced. After a thorough immersion, the wood fiber and the nitric acid have formed that important alliance which is responsible for the explosive properties of Schultze powder.

The next series of processes are for the purpose of removing every trace of free acid from the nitrated fiber, or nitrolignin as it is termed. The latter substance in its pure state is stable and reliable. It may be stored, heated within reasonable limits of temperature, and in many ways treated with a good deal of familiarity; but should there remain the slightest trace of uncombined acid, many uncertainties arise, and the resulting powder will not satisfy the severe requirements of our Home Office. The wet mass taken from the nitrating tank is put in a centrifugal machine, where a large proportion of superfluous acid is removed, and then it is tipped into cold water. After this it has no peace for about four weeks—it is boiled, it is torn up and disintegrated by "devils," and rolled under five ton edge runners.

The nitrated fiber is now ready, granting of course that it is passed by the chemist in charge, for the second portion of its treatment, viz., its formation into grains. In the first place it is filled into small sacks, and placed under a hydraulic press, from which it emerges comparatively dry and in the form of a hard cake. After this it receives a further course of edge runners, and the opportunity occurs for adding to the nitrated fiber the other ingredients, of which oxidizing salts and paraffin are chiefly notable. The next process is the simple one of shaking it up on sieves with a very fine mesh. This causes the detached pieces of fiber to become granular as a result of the bumping they get against one another; and when grains small enough to pass the mesh are formed, they fall through and are collected beneath. A repetition of this process in a sieve with a smaller mesh serves to improve the form and regularity of the grains.

The manufacture of Schultze powder is now approaching completion, for these grains have only to be dried, and then they will resemble this powder as it was prior to the beginning of last year; but now the hardening process is added. We need not linger over the drying, beyond stating that the powder is spread on canvas trays and a current of warm air is passed through it until the drying is complete.

The grains are hardened by being placed in revolving barrels, kept at a fairly high temperature by hot water jackets, and having poured into them a colloid mixture. The effect of being shaken up in close contact with this mixture under favorable conditions

of temperature is for the colloid to penetrate to the interior of the somewhat loosely built up grain and form a glaze in and around it, the outer surface being left somewhat harder than the interior. For reasons of economy the spirits are volatilized and condensed to the amount of 90 per cent of the original quantity into their prior form, so as to be used over again. That this hardening process has improved the powder is evidenced by the greatly increased sales registered during the past year.

After a careful sifting of the grains, the powder is passed into one of the magazines.—Arms and Explosives.

**THE NAFEW-LOVELL CHECK PROTECTOR.**

The illustration represents a recently introduced check protector. A new feature in the construction of this check perforator is a flexible die and a yielding anvil, which are so combined and arranged as to entirely obviate the need of the punches being kept sharp, thus insuring satisfactory work indefinitely.

By removing the cover, which is readily done by taking out the three screws in the base, the whole of the mechanism is within easy reach and touch, and simplicity of action combined with durability is at once seen. The action of the entire device is clean and accurate, and the moving parts instantly respond to the operating lever.

As will be seen, it is utterly impossible to raise checks in which the sums called for have been punched out, as shown, with the dollar mark punched after the last figure of the amount of each check. All banks are pleased to see such improvements adopted by their customers, as this one is an absolute preventive against one kind of forgery.

In operation, an adjustable guide piece, at one side, is placed as required to cause the punched figures to come in the right place, when the check is slipped in



A NEW AND SIMPLE CHECK PUNCH.

the punch with one end against the guide. The disk on which are the figures is then moved in either direction to bring the first figure to be punched under the punch lever, the disk being correspondingly moved for each succeeding figure, and the check being automatically moved along by the feed device in front, the latter being raised by its finger piece to release the check punch after punching. The picture also represents the figures as punched.

The machine is manufactured by the Samuel Nafew Company, No. 26 Cortlandt Street, New York City, U. S. A.

**African Mahogany.**

The Southern Lumberman says that mahogany logs from the west coast of Africa have got as far as Louisville, Kentucky, and adds that it is much cheaper than the mahogany from Central America and Cuba. From these mahogany forests in Africa it is said that twelve million feet of lumber have already been cut and exported, and they promise to yield an immense revenue to the British and French colonists who have seized upon the territory. The wood has a tinge of pink in contrast with the somewhat reddish color of the American variety, and some of the squared logs which have been imported are two by three and a half feet in size. We may add that some of this African mahogany is the wood of *Khaya senegalensis*, a tree which belongs to the same family as the true mahogany, and is closely related to it. It is not so desirable a cabinet wood as the Mexican or Cuban mahogany, but is more like the Central American wood. Occasionally there are logs richly figured, and these have been manufactured here into very attractive veneering.

The chime whistle has been adopted as standard for passenger locomotives on the Pennsylvania Railroad. Many of the engines are already equipped with these whistles.

**Photography and Law.**

BY WM. GEO. OPPENHEIM, PH.D., L.B.

Is it or is it not a vicious doctrine to deny all right of privacy even to concededly public persons?

Should the rights of the public be recognized only in public side or public relations of a public man—not in his whole personality?

Presiding Judge Van Brunt (General Term, first department, New York) held (64 Hun., 594) as follows:

"It is undoubtedly true that by occupying a public position or by making an appeal to the public, a person surrenders such part of his personality or privacy as pertains to and affects the position he fills, or seeks to occupy; but no further."

Is it not true, then, that the law of privacy ought to permit a statesman, or inventor, or artist, or philanthropist, no matter how famous he becomes, to enjoin the publication of his picture or the erection of a statue, if such form of publicity is distasteful to him or her?

In the case of *Marion Manola v. Stephens*, the New York Supreme Court, at special term, granted an injunction under the following circumstances, which appears to be a precedent for restraining—at the suit of a living person—the circulation of her pictures, even though she be a public character.

"The plaintiff Manola alleged that while playing in a New York Broadway theater, in a role which required her appearance in tights, she was, by means of a flashlight, photographed surreptitiously and without her consent from one of the boxes of the theater."

The court issued an injunction to restrain any use being made of the pictures so taken.

An actress would seem to be a public character, and, moreover, the picture in question was taken of her while actually officiating in her public capacity.

This would seem to argue that even a living public character has a right to enjoin the publication of a distasteful picture.

The question is, however, more difficult of solution with regard to deceased persons, and the general nature and limitations of such rights are not rendered clear by the various opinions delivered in the celebrated case of *Schuyler v. Curtis*, now on appeal to the New York Court of Appeals.

In the latter case, the action was brought by relatives of the deceased, Mrs. Schuyler, to restrain the erection of a proposed statue to her in the World's Fair at Chicago, as "The Typical Philanthropist."

The views expressed in the *Manola* and *Schuyler* cases seem to be at variance with the *Corliss* case in the Federal Circuit Court, in which the decision containing the following language was rendered by Mr. Justice Colt:

"But while the right of a private individual to prohibit the reproduction of his picture or photograph should be recognized and enforced, this right may be rendered or dedicated to the public by the act of the individual, just the same as a private manuscript book or painting becomes (when not protected by copyright) public property by act of publication.

"The distinction in the case of a picture or photograph lies, it seems to me, between public and private characters.

"A private individual should be protected against the publication of any portraiture of himself; but where an individual becomes a public character the case is different.

"A statesman, author or artist, or inventor, who asks for and desires public recognition, may be said to have surrendered this right to the public. When any one obtains a picture or photograph of such a person, and there is no breach of contract or violation of confidence in the method by which it was obtained, he has the right to reproduce it, whether in a newspaper, magazine, or book. It would be extending this right of protection too far to say that the general public can be prohibited from knowing the personal appearance of great public characters. Such characters may be said, of their volition, to have dedicated to the public the right of any fair portraiture of themselves."

This action, it will be noted, was brought by Mr. Corliss' widow and children.—American Amateur Photographer.

**Naval Carrier Pigeons.**

Prof. Marion, instructor of modern languages at the United States Naval Academy, who has charge of the pigeon loft there, says that Secretary Herbert is entirely in favor of the system of the use of carrier pigeons in the navy, and that it is the hope of those interested to have carrier pigeon cotes at all our naval stations.

Last summer birds were taken aboard the *Monongahela* and the *Bancroft* on the summer cruise of the cadets, and during the whole period only nine birds failed to appear, or less than ten per cent of the entire number. Prof. Marion states that the flights of his birds have in several instances been as long as 200 miles over the ocean, with a speed somewhere near thirty miles an hour.