

**SPRING BED BOTTOM.**—GABRIEL B. DAVIS and CHAS. B. DAVIS, Freeport, Ill.—The object of this invention is to so construct a spring bed bottom as to have a uniform springing capacity, as well as also to be simple in arrangement of parts, and thus not likely to get out of order.

**COMBINED STOVE-LID LIFTER, PINCERS, PAN, POT, SADRON, ETC., LIFTER, AND HAMMER, AND TACK PULLER.**—J. C. LONGSHORE, Mansfield, Ohio.—This invention consists in the combination in one implement of several articles in constant use about a kitchen, to wit, a lifter for stove covers, etc., and a tack-puller.

**APPARATUS FOR DISCHARGING GRAIN FROM VESSELS.**—C. M. MERRY, Dunleith, Ill.—This invention has for its object to facilitate the unloading of grain and other substances from vessels.

**ORL CAN.**—W. J. PRALL, Pomeroy, Ohio.—This invention is designed to furnish a neat, durable, and convenient can for holding and handling carbon and lard oils.

**FUMIGATOR.**—ISAAC HUTCHINS, Jr., Wellington, Me.—This invention is designed to furnish an instrument for destroying lice and ticks upon sheep and cattle by fumigating them with tobacco smoke.

**CHURN.**—M. BRATT, Maysville, Kentucky.—This invention is designed to furnish a churn, so constructed and arranged that the air may be forced into the churn beneath the dasher, to lessen the time required for the operation of churning, and increase the yield of butter.

**HANGING OF GATES, DOORS, ETC.**—W. T. WELLS, Decatur, Ill.—This invention consists in so hanging a gate, etc., that it can be adjusted either in a vertical or horizontal plane, without necessarily detaching it from its hinges or removing and re-setting them.

**WASHING MACHINE.**—JONATHAN J. GREEN, Grand Rapids, Mich.—This invention consists in the combination of a flexible concave with a fluted cylinder, the peculiarity of the concave being that it consists of a series of ribbed slats, joined together by a flexible belt, whereby it is enabled to rise or fall, so as to adjust itself to the clothes between it and the cylinder.

**APPARATUS FOR DRYING DISHES, PLATES, ETC.**—C. W. SCHROEDER, New York City.—This invention relates to a box or stand which is provided with one or more shelves to receive the dishes, plates, etc., to be dried, and with steampipes or other suitable heaters, in such a manner that dishes, plates, and other similar articles, when placed on said shelves after they have been washed, will dry rapidly by the action of the air, and the use of a towel for wiping such dishes, plates, etc., in order to get them dry, can be dispensed with.

**TACK EXTRACTOR.**—F. M. OSBORNE, Dover Plains, N. Y.—With this implement tacks, etc., can be drawn with the utmost ease, and with but little labor or trouble.

**LOOM FOR WEAVING HATS.**—PHINEAS LEESON SLAYTON and CHARLES I. KANE, New York City.—This invention is an improvement in the loom described in Letters Patent, granted to William Leeson Slayton, February 2, 1864, and November 22, 1864, where the distinct sets of weaving mechanism are employed, whereof one weaves the crown and brim of a hat, and the other the cylindrical side crown, the two sets being so arranged in the same frame that the warp carriers can be transferred from one set to the other at pleasure during the progress of the work for the purpose of weaving the different parts of a hat in due order.

**CORK TONGS.**—J. T. ASHLEY, Brooklyn, N. Y.—With the cork tongs embraced in this invention corks can be freely and easily withdrawn from bottles, whether in their necks or inside.

**CATTLE GAG.**—WILLIAM KEGG, Lassellville, N. Y.—This invention is designed for holding open the mouth of an animal for removing from its throat anything which may be choking the animal.

**PROCESS OF MAKING LEAD FROM DROSS AND SCUMMINGS.**—CHARLES PICKERING, St. Louis, Mo.—This invention consists in treating dross and scummings made from lead by smelting with sulphur, saltpeter, and asafetida in suitable proportions, in such a manner that the metallic lead contained in said dross and scummings is separated from the impurities mixed therewith, and a large quantity of lead is saved which is otherwise thrown away as waste.

**MACHINE FOR CRUSHING GRAIN, ETC.**—CHARLES P. BENOFF, Detroit, Mich.—This invention consists in the employment or use in a machine for crushing grain and other materials, of two rollers, one of which is grooved in a longitudinal, and the other in a transverse direction, in such a manner that the grooves of one roller hold the grain or other material to be crushed in position for the other to act upon, and a machine is obtained by which the operation of crushing grain, etc., can be effected with ease and facility, and with comparatively little expenditure of power.

**PIN FOR FASTENING BUTTONS, SHAWLS, ETC.**—A. LINDSAY and MYRON MOSES, Malone, N. Y.—This invention relates to a new and improved mode of attaching studs, breastpins, etc., to clothing, so that they are less liable than heretofore to become accidentally detached and lost; and also to an improved device for releasing or detaching the same.

**CAR TRUCK.**—JOHN S. HOWARD, Schenectady, N. Y.—This invention relates to a new and improved application of elliptical springs to a car truck, whereby the truck is allowed to rock or vibrate freely, and much wear and tear of the running gear of the car avoided.

**MACHINE FOR CREASING, SLICKING, AND SKIVING LEATHER.**—C. C. BELLOW, New Ipswich, N. H.—This invention relates to a new and improved machine for creasing, slicking, and skiving leather, and it relates to an improved means for supporting the lower adjustable collar, whereby the latter is prevented from springing as the leather is drawn between the two rollers. The invention also consists in a novel application of a skiving knife and also of the lower roller, adjustable collar, and in the application of a saddle-skirt creasing device, whereby a very efficient device is obtained for the manufacture of leather straps for harnesses, and the creasing of saddle skirts, etc.

**PLOW.**—JAMES L. ROBERTS, Brunswick, Ga.—The object of this invention is to obtain a plow of simple and cheap construction which will be strong and durable and have a reversible land side.

**WASHING AND WRINGING MACHINE.**—JOHN LAMB, Jeffersonville, N. Y.—This invention is designed to furnish an improved washing and wringing machine, and it is so constructed and arranged that the clothes may be rubbed more or less as may be necessary, and then wrung by the same operation.

**BROOM HEAD.**—JOHN HARRIS, Marquette, Wis.—This invention is an improvement in the construction of Harris's broom head, patented May 1, 1866.

**PLASTIC ROOFING.**—WILLIAM L. POTTER, Clifton Park, N. Y.—This invention is designed to furnish an improved, cheap, temporary roofing for light structures, such as tents, shanties, car tops, decks, and roofs generally.

**FEED CUTTER.**—WILLIAM F. ALTFATHER, Johnstown, Pa.—This invention is designed to furnish an improved cutter, simple in construction, durable and cheap; and which will do its work readily and at the expense of comparatively little power.

**STITCHING CLAMP.**—WILLIAM W. TAYLOR, Newark, N. J.—This invention consists in combining a toggle, lever and jointed bars with the jaws of the clamp in such a way that the said jaws may be both opened and closed with the feet of the operator, leaving both his hands free to be used in adjusting the work.

**CHURN DASHER.**—N. M. SPENCER, Canandaigua, N. Y.—This invention consists in making the dasher bowl-shaped with horizontal holes through its sides around its lower edge, and with two or more valves in its upper part around the base of the dasher handle.

**GARDEN AND POTATO FORK.**—J. S. PATTERSON, Whitney's Point, N. Y.—This invention consists in the combination of a triangular fulcrum with a fork, for the purpose of furnishing a means by which weeding may be done in a garden and potatoes or other vegetables dug, thoroughly, easily and rapidly.

**PUMP FOR COMPRESSING AIR, ETC.**—J. N. DENNISON, Newark, N. J.—This invention consists in the employment or use, in an air-pump, of two cylinders of unequal diameters fitted with pistons which operate in opposite directions and communicating with each other by means of a pipe provided with valves at both ends, the valve next to the largest cylinder being made to open outward and that next to the smallest cylinder inward, in combination with a suitable supply pipe extending to the large cylinder, and a discharge pipe connecting from the small cylinder, each pipe being provided with a valve, that in the supply pipe opening inward, and that in the discharge pipe opening outward, in such a manner that when the piston in the large cylinder descends, the air contained in the same is compressed in the small cylinder, and in the down stroke of the piston in the small cylinder the compressed air contained therein is forced down into the reservoir containing compressed air, or into the well containing gases under a high pressure, and thereby much power is saved.

**PIPE STEM.**—CONSTANTINE HINGHER, New Brunswick, N. J.—The present invention consists in the arrangement of a curved tube leading from the upper part of the pipe stem down close at the inner surface of the cap, and bent in such a manner that when the pipe is laid down on either side the mouth of each curved pipe is elevated and the water or liquid in the cup is not permitted to run up into the stem.

**TRANSMITTING MOTIVE POWER.**—R. T. SMITH, Nashua, N. H.—This invention relates to a device intended to transmit motive power from a revolving shaft to a revolving cutter or brush, or to any other article which is secured to a handle and arranged in combination with a universal joint in such a manner that said handle together with the brush, cutter or other article can be freely turned in either direction without interfering with the motion of said brush, cutter or other articles, or with any part of the mechanism which serves to transmit the power from the revolving shaft to said brush, cutter or other article.

**COUNTER-SUPPORTER FOR BOOTS AND SHOES.**—JOSEPH REISING, Aurora, Ill.—This invention relates to a counter-supporter which is provided with a bottom flange and with a hole in its top end in such a manner that the same can be firmly screwed between the inner and outer sole and also at its upper end to the counter, and that a supporter is obtained which effectually prevents the counter working on one side, keeping the same straight as long as the boot or shoe will last.

**HAY ELEVATOR AND CONVEYOR.**—A. D. MINMAN, Stepnay Depot, Conn.—This invention relates to a new and improved device for elevating and conveying hay for the purpose of depositing it in barns.

THE MARKETS.

The state of business is somewhat unsatisfactory. Prices, although unusually high and with no prospect of abatement, are considered by sellers unremunerative. Money is plenty at low rates, and accommodation on fair paper is easily obtained. But this does not seem to have much effect on business generally. The cautious purchases of country merchants thus fall have induced our dealers to offer inducements for long credits, a mode of doing business which we hoped had passed by. Our exports of flour and grain for the last month have been daily decreasing, while prices have not only been maintained, but have advanced; yet the incoming crop is a good one. The state of business generally is an anomalous one.

**ASHES.**—Pots are in demand, but the supply is limited. Prices advanced to \$10 00@10 12 1/2 per bbl. Pearls are scarce, at \$14.

**BRICKS.**—Prices advanced. Common Hard, \$13@13 50. Croton, \$18@20. Philadelphia front, \$60.

**COAL.**—Foreign scarce and in demand. Lehigh, at Elizabethport, \$7 50. Cumberland, at Georgetown, D. C., \$5 50. Freight on Cumberland \$2 25. Stove retails at \$7 50@8 50.

**COFFEE.**—Demand for Rio, Laguayra, 23 1/2@19c., gold; 26c., currency. Costa Rica, 20c. Java, 25 1/2c.

**COPPER.**—Detroit, \$1@31 1/2c.; Portage Lake, 31 1/2c.

**COTTON.**—Market fluctuating from reports of the English Market and of frosts at the South. Prices have, however, receded to the level of our last quotations. Ordinary, 32 1/2c.; Middling, 38 1/2@40 1/2c.; Good Middling, 41@44c.

**FLOUR.**—Prices have advanced. The supply hardly keeps pace with the demand. Common brands, \$11 50@12 25; Ohio fancy, \$12 90@12 95; Genesee extra, \$13 25@13 50.

**GRAIN.**—We notice considerable advance in prices. Milwaukee, Spring, \$2 25@2 40; Amber, \$3 05@3 12. Canada White, \$3 25@3 30. Bye, \$1 28@1 39 for old, and \$1 40 for new. Barley, Canada West, \$1 32@1 33, duty paid; Western, \$1 18.

**IRON.**—Scotch Pig scarce. Prices have advanced. Glengarnock, \$52@53. American \$48. Bar, refined, \$105@107 50.

**LATHS.**—Are firm, with sales of Eastern at \$4 25.

**LEAD.**—Market dull. Pig 10 1/2 currency. Bar, 11; and Sheet and Pipe, 11 1/2c.

**LEATHER.**—The market for Hemlock Sole is very firm, with a fair demand. We quote Rio Grande and Buenos Ayres Light Weights, 32 1/2@33c.; Middle do., 34 1/2@36; Heavy do., 37@38; California Light, 32@34 1/2; Middle do., 34@35; Heavy do., 36@37; Orinoco, etc., Light, 30@31 1/2; Middle do., 32@33; Heavy do., 31 1/2@33; Slaughter Upper in Rough, 33@36.

**LIME.**—The market for Rockland is steady at \$1 70 for common, and \$2 10 for Lump, cash. Rosendale Cement, \$1 75, cash.

**LUMBER.**—The market for Eastern Spruce and Pine is moderately active, with sales at \$22 50@24, usual terms.

**MOLASSES.**—Centrifugal and Clayed Cuba, part mixed, 45@47; Cuba Muscovado, 48@51 1/2c. Barbadoes, at 58. Porto Rico, 56@75c.

**NAILS.**—Cut may be quoted 7@7 1/2c., the lower rates for lots of 500 kegs and over—3d., 10d., 3d., and 3d. Fine are very scarce—Cinch, 8 1/2 (8d are very scarce); forged horse, 32; pressed do., 22@24; copper, 50; yellow metal, 32; zinc, 20; and wrought ship and boat spikes, 7@8, cash.

**SUGAR.**—Refining Cuba, 10 1/2@11 1/2. Refined, 16 1/2@16 1/2 for hard; 15 1/2@15 1/2, soft white; 14 1/2@14 1/2, yellow. Crushed and granulated 16c.

**WOOL.**—The market is greatly depressed; very little disposition to purchase on the part of jobbers or manufacturers. Unwashed Western, 31 1/2c.; choice washed, 45c@65c.; Picklock, 70c@75c.

**ZINC.**—9 1/2c. less 4 per cent. for gold; 13 1/2c., currency, for L-high.



J. P. W., of N. Y.—*Spiegeleisen* is a term used to denote iron containing manganese. It is from two German words meaning "mirror iron," or "looking-glass iron," and is so called from its brilliant crystals. It comes from a sphatose ore found in Germany, and is a combination of four or five per cent of metallic manganese with ordinary iron. It is used to give hardness to the soft iron made by the Bessemer process, but adds carbon as well as manganese to the melting. Manganese for which *spiegeleisen* is ordinarily used, can be obtained measurably if not entirely free from carbon, by treating its oxide with charcoal, both in lumps. Iron, however, is the best vehicle for manganese, as alone it has too great an affinity for oxygen.

F. M. E., of Mo.—Rubber belts can be kept from slipping by powdered rosin. The heat of a boiler is injurious to either leather or gum belts. It burns one and softens the other.

M. C. J., of N. Y.—Oil for tempering should be animal, as whale or fish oil. Tallow is good for small tools. Any steel worker or dealer will direct you to the best quality of steel for the tools you wish to make and the work you wish to do.

O. W. L., of Ind.—A good hydraulic cement for your aquarium can be made from powdered pipe clay, three parts by weight, to one of oxide of iron, mixed with boiled linseed oil sufficient to form a paste. Aquariums put together with thin strips of rubber in the joints are, however, preferable.

C. D. B., of Md.—Mucilage from gun tragacanth is merely the maceration of the gum in water. If you cover the bottom of a common mucilage bottle with the dry gum, water will swell it in a few minutes, if stirred, to nearly fill the vessel. Starch paste is not applicable to all the uses of mucilage. It will not take the place of the gluten used on postage stamps and envelopes. As amucilage for ordinary and frequent use it is excellent. All these preparations may be prevented from souring by adding a little alcohol to the water, and may be perfumed by the use of *eau de Cologne* or essences.

A. L., of N. Y.—You ask: "Is it possible to hear a shot or shell fired from a gun pointing toward you, the distance between you and the gun being two or three miles?" Certainly it is. Sound travels, in a temperature of 60 deg., over 1,100 feet per second, and the force is a constant one, losing nothing by distance; whereas the initial velocity of a cannon ball varies from 1,100 to 1,400 feet per second, perhaps some times exceeding the latter number. This is, however, a constantly and rapidly decreasing quantity. In shooting four miles under any circumstances the sound of the explosion would precede the arrival of the shot.

J. D. F., of Washington, D. C.—We do not know and cannot ascertain anything of the oil company you refer to. The best lubricating oil is unquestionably sperm. Olive and lubricating petroleum rank in our estimation next.

W. and S. H., of N. C.—Your question, "how long would it take a train of powder six inches deep and a mile long to burn," does not furnish sufficient data for a direct answer; moreover, such an answer would require experiment, which would be inconvenient for us to perform. The rapidity of burning of trains of powder depends upon a variety of circumstances in addition to the quality of the powder. A train of powder contained in a paper tube may be made to burn explosively and at the rate of over a hundred feet in a second. The burning of a train a mile long would be notably affected by the pressure of the atmosphere.

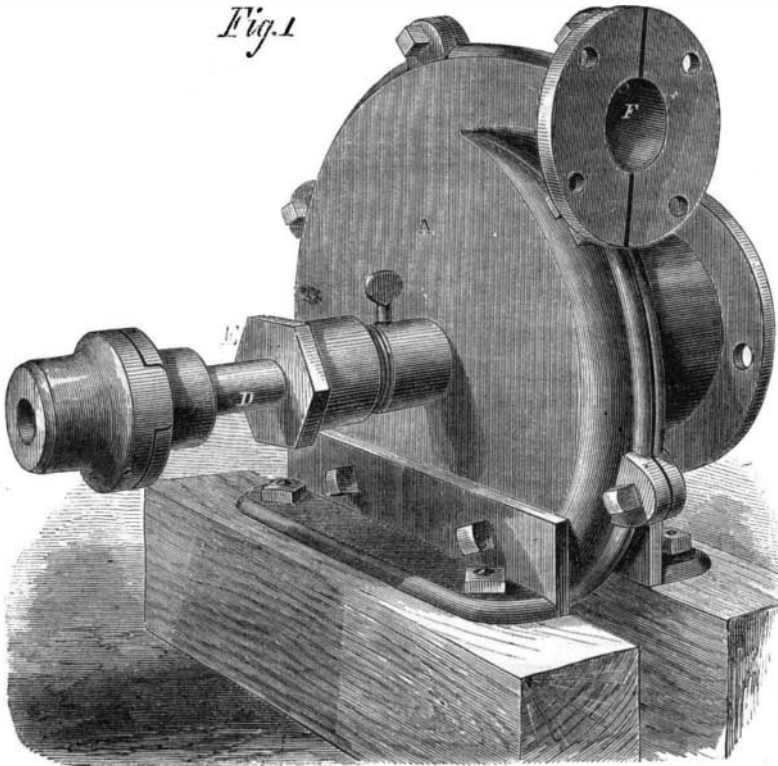
A. L., of Vt.—Liquid glue is made by dissolving glue in acetic acid No. 8, or by adding to ordinary dissolved or melted glue, a small quantity of nitric acid (1 oz. acid to 1 lb. of dry glue) and boiling. A good cement for glass and china ware is made by mixing the white of an egg with quick lime. Another favorite cement is shellac, applied melted, or dissolved in alcohol.

"O. G." thinks the deck houses or cabins of vessels as well as the galleys should be only temporarily secured to the deck, so that in case of danger they could be detached and serve as rafts. The idea is not new, but has never been considered practically useful.

**Improved Patent Rotary Pump.**

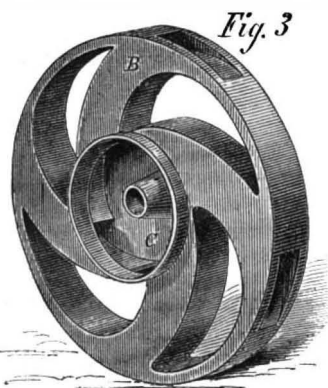
Few implements or machines have been devised which have been subjected to so many modifications as the pump. There was a time when rotary pumps, on whatever plan constructed, were unpopular. The prejudice is, however, fast disappearing before the unanswerable logic of facts. Rotary pumps are made which cannot be surpassed for efficiency and durability by any reciprocating pump. The machine under consideration is of that class of pumps known as centrifugal pumps, receiving the

Fig. 1



water at the center, forcing it to the circumference, and raising it to the point desired by centrifugal action.

The scroll or shell, A, is of cast iron, made in halves, and bolted together in the usual manner. Inside is a piston, B, Fig. 3, consisting of a wheel with curved radial arms, the curve being opposed to the direction of rotation. These arms are cored, or cast hollow, opening on the periphery, and communicating with a central chamber, C. This piston



is mounted on a shaft, D, with suitable bearings, and, on the upright form of the pump, having a gland, or stuffing box, E. It will be noticed that the walls of the chamber, C, project. This projection fits in a corresponding recess on that side of the shell where the water enters, so that none of the water can get between the piston and the outside of the case; it must follow the passages through the arms and be discharged at F. The rim of the piston, B, serves the same purpose, as it fits the interior circumference of the case and prevents the escape of the water from the piston to the inside of the case. This insures a freedom from undue friction and prevents the churning of the water. The combination of these two devices, it is claimed, gives this pump a great superiority over others of similar principle. This pump is equally effective, worked either vertically or horizontally.

It was patented July 25, 1865, by Geo. W. Heald

and L. D. Sisco. For additional particulars address Heald, Sisco & Co., manufacturers, Baldwinsville, N. Y.

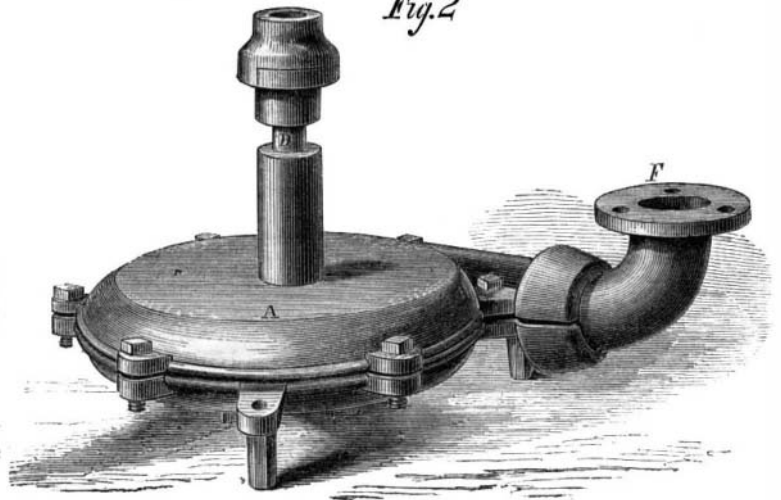
**ENGLISH AND AMERICAN GUNS.**

The Shoeburyness experiments, with the nine-inch Woolwich rifle and the Palliser chilled bolt, seem to have operated as a soothing salve to the wounded pride of our English cousins, when, by a personal examination of the *Miantonomoh* and her armament, they were forced to give a reluctant assent to our

while the fifteen-inch shot (American) is spherical, and, therefore, in traversing a given distance the velocity of the American projectile, and consequently its efficiency, will be greatly reduced, as compared with those of the rifled bolt, because the sphere offers most surface to the resistance of the air. It may be assumed with safety, that the velocity of the spherical shot will be reduced one-tenth in traversing the first 500 yards after leaving the gun, while that of the rifled projectile will not be appreciably diminished in accomplishing the same distance."

The conditions of the test, then—which the *Engineer* seems determined to make it—are very unequal in these respects. But there are other important considerations to be noted before a comparative test can be deduced from the two experiments. In the case of the Fortress Monroe trial, the object sought was to ascertain the power of granite walls to resist heavy shot, and the desirability of protecting them with iron plating. The Shoeburyness experiments were to ascertain the resisting force of the plated

Fig. 2

**HEALD & SISCO'S ROTARY PUMP.**

superiority in the manufacture of naval guns and ships. This assent was given, not in so many words of acknowledgment, but by a general demand on their Government for monitors and large guns.

It cannot be successfully disputed, as we stated in our issue of the 20th Oct., that the results of the Shoeburyness experiments were remarkable. That a bolt of chilled iron, fired from a nine-inch rifle, should penetrate a target of eight inches of solid rolled iron, backed by eighteen inches of teak and a thin inner skin of plate, when the projectile weighed but 254 pounds and was impelled by only 43 pounds of powder, is a reason for gratulation. But it affords no adequate reason for belittling the performances of the fifteen-inch smooth-bore, or the twelve-inch rifle of the American pattern.

That this is the *animus* of an article in the *Engineer* of Oct. 12th, is apparent. We have no disposition to follow the editor of that journal in his four-column attempt to prove the inferiority of American ordnance, but simply to draw attention to some of his admissions. While doubting the actual existence of 20-inch guns, and repudiating the idea that they can bear a charge of 140 pounds of powder, the editor intimates the expediency of constructing 15 and 20-inch rifled wrought-iron guns. This sounds queerly with the following from the same article:—

"We believe that, at this moment, the nine-inch English rifle is the most powerful weapon in the world; but it would be folly to attempt to maintain that it will retain this supremacy for any lengthened period; and it is much better that we should try our 'prentice hands at making fifteen-inch guns in time of peace, rather than have their construction forced upon us in time of war."

According to a carefully-prepared table in the same article, the *Engineer* demonstrates, to its own satisfaction, that the American fifteen-inch smooth-bore cast-iron gun is inferior to the English rifled wrought-iron piece, yet the comparative results of the Fortress Monroe and Shoeburyness experiments, on which the article is based, appear to be insufficient to allay well-grounded apprehensions.

The *Engineer* further says: "It must not be forgotten that the nine-inch (English) shot is rifled,

broad-sides of ships. In the first case the distance fired was 350 yards; in the latter only 200 yards, and a rifled gun was used for the latter, while the parallel is sought to be drawn between that and the smooth-bore used in the former.

The composition as well as the form of the shot is another important element. In the Fortress Monroe tests the shot was of ordinary cast iron; in the Shoeburyness trial of hardened steel and the Palliser chilled iron, which, so far, seems to be the best material for penetrating qualities as yet used. This last fact, as we intimated in the *SCIENTIFIC AMERICAN* of the 27th Oct., is the evident cause of the success of those experiments, rather than the description of gun from which the shot were fired.

The most significant comment, however, on the criticism of the *Engineer* in addition to its own commendation to copy our example in constructing fifteen and twenty-inch guns, is the following from *Ryland's Iron Trade Report* of Oct. 6th:—

"Government has ordered one of the fifteen-inch Rodman guns, with improved carriage, shot, and powder, from the United States. This is a great step in the right direction. It would be obviously premature and even dangerous to come to an absolute decision on the question of guns and projectiles while we are still so completely in the dark as to the merits of the American system. The gun is likely to arrive in this country in six or seven weeks. It is strange the late Government never thought of so practical a mode of settling the question between British and American ordnance."

**Photo-Medallions.**

This is a new way of producing portraits in relief or medallion style, in plaster, resembling marble sculpture. A photographic print is first made upon wax, clay, or other suitable material, and then, by mechanical means, an intaglio is sunk, from which plaster casts—forming beautiful, accurate likenesses in relief—are produced at a comparatively small expense. Mr. G. G. Rockwood, of 839 Broadway, New York, one of our most enterprising photographic artists, has shown us some fine examples of the "Photo-Medallion."