100,553.—PURIFYING ACETIC ACID.—T. L. Olden, Brooklyn, N. Y.
100,554.—WOOD PAVEMENT.—A. Warner Platt, New York city.
100,555.—GRAIN DRILL.—Hiram Pulse, Waldron, Ind.
100,556.—LOCK.—Daniel B. Read and J. H. Clapp, Providence, R. I., assignors, by mesne assignments, to C. C. Dickerman, Boston, Mass.
100,557.—STOVE-PIPE DRUM.—Edmund D. Roberts, Hartford, Conn.
100,558.—WINDOW-SHADE HOLDER.—E. J. Robinson, Syracuse, N. Y.
100,559.—GASOMETER.—Thomas F. Rowland. Green Point, N. Y.
100,560.—SLED BRAKE.—G. W. Sanborn (assignor to J. W. Sanborn), Gilmanton, N. H.
100,561.—SELF-CLOSING FAUCET.—Carl Schultz and Thomas Warker, New York city. Antedated February 21, 1870.
100,562.—CALKERS' MALLET.—Samuel C. Searles, Wilmington, Del.
100,563.—FELTED FABRIC.—S. P. Siver, Danbury, Conn.
100,564.—TOY MONEY BOX.—F. W. Smith, Jr., Bridgeport, Conn.
100,565.—RIDING SADDLE.—Eugene Spedden, Astoria, Oregon.
100,566.—FURNACE FOR SMELTING, AND FOR OTHER PURPOSES.—John Thomas (assignor to himself, William Bacon, Harrison Groves, and Hugh Chaytor), Middlesbrough, Eng. Patented in England, July 18, 1868.
100,567.—BALANCED WATER ELEVATOR.—W. L. Thomas, Wadsworth, Ohio.
100,568.—SEAL LOCK.—Gustave Ulman (assignors to C. R. Goodwin), Ivry-sur-Seine, near Paris, France.
100,569.—BED BOTTOM.—W. W. Wait, Richmond, Ind.
100,570.—MACHINE FOR MAKING HORSE SHOES.—Edwin Wassell, Wood's Run, Pa.
100,571.—STOVE SHELF AND DRYER.—J. J. Watson (assignor to himself and Hiram Watson), Coatsville, Pa. Antedated March 1, 1870.
100,572.—VAPOR BURNER.—Henry Wellington (assignor to himself and T. P. Doane), Chicago, Ill.
100,573.—FERTILIZER SOWER.—T. J. West (assignor to himself, J. L. Russell, and A. C. Frisby), Alfred Center, and Joel Morekess, Andover, N. Y.
100,574.—MACHINE FOR MAKING HORSE SHOES.—Chas. W. Wettengel, Pittsburgh, Pa.
100,575.—LOOM CAM.—George O. Wickers, Lawrence, and Thomas J. McClary, North Andover, Mass.
100,576.—STEAM PUMP DEVICE.—Martin Wilcox, Sacramento, Cal. Antedated December 30, 1869.
100,577.—SASH HOLDER.—James Wilkinson, Albany, N. Y.
100,578.—LANTERN.—Arnold Withmar, St. Louis, Mo.
100,579.—METHOD OF LAYING OFF PATTERNS FOR STITCHING ON LEATHER.—William P. Wolfington, Louisville, Ky.
101,580.—INLAYING METALLIC SURFACES.—E. G. Wright, Boston, Mass.
100,581.—BOLT MACHINE.—John R. Abbe, Providence, R. I. Antedated March, 1, 1870.
100,582.—UMBRELLA.—Edward Adams, Boston, Mass.
100,583.—VEGETABLE AND FRUIT PEELER.—E. D. Averell and Joseph Malan, Brooklyn, N. Y.
100,584.—CARRIAGE WHEEL.—James R. Baird, Vincennes, Ind.
100,585.—EXPANSIBLE CORES FOR CASTING IRON, GLASS, ETC.—Anson Balding, Wheeling, West Va.
100,586.—MUSTACHE GUARD FOR DRINKING VESSELS.—E. W. H. Bass, Quincy, Mass.
100,587.—COMPOUND TO BE USED AS AN ARTICLE OF DIET.—C. G. Baylor, Quincy, assignor to E. S. Tobey, Richard Soule, and Chas. Soule, Boston, and Louisa D. Baylor, Quincy, Mass.
100,588.—PAINT COMPOUND.—Ezra Blakeley (assignor for one half to Peter Pierson), Neponset, Ill.
100,589.—RAILROAD CAR VENTILATOR.—Isaac Bonnell, Jr. (assignor to himself and H. G. Lumbard), Chicago, Ill.
100,590.—BRICK MACHINE.—G. C. Bovey, Cincinnati, Ohio.
100,591.—WATER-PROOF FABRIC.—Thomas Bracher, Rahway, N. J. Antedated February 26, 1870.
100,592.—REDUCING GEAR FOR STEAM ENGINE INDICATORS.—H. L. Brevort, Brooklyn, N. Y.
100,593.—BLIND.—W. E. Brock, New York city.
100,594.—ADJUSTABLE WINDLASS.—John S. Brown, Schenectady, N. Y.
100,595.—PUMP.—James Byran, New York city.
100,596.—LET-OFF AND TENSION DEVICE FOR SPOOLS OF BRAIDING MACHINES.—James D. Butler, Lancaster, Mass. Antedated February 26, 1870.
100,597.—DITCHING MACHINE.—James Calliham (assignor to David M. Calliham), Baton Rouge, La.
100,598.—PRINTING PRESS.—Adam Campbell, Brooklyn, N. Y.
100,599.—ANIMAL TRAP.—Henry C. Case, Pekin, Ill.
100,600.—SCHOOL DESK AND SEAT.—Wesley Chase, Buffalo, N. Y.
100,601.—LAUNDRY INDICATOR.—Robert Clarke, Macon, Ga.
100,602.—WRENCH.—A. G. Coes, Worcester, Mass.
100,603.—HAND RUBBER FOR WASHING CLOTHES.—G. F. J. Colburn, Newark, N. J.
100,604.—MACHINE FOR PICKING CURLED HAIR.—N. L. Cole, (assignor to himself and A. N. Upham), Norwich, Conn.
100,605.—BRAD SETTER.—M. D. Converse, London, Ohio.
100,606.—FLOATING SHIP.—G. W. Corey and T. Losie, New York city. Antedated Feb. 28, 1870.
100,607.—PRESS.—Dexter Curtis, Madison, Wis. Antedated Feb. 26, 1870.
100,608.—COMPOSITION FOR PRESERVING TIMBER AND WOOD.—Edward J. De Smedt (assignor to N.Y. Improved Anthracite Coal Co.) New York city.
100,609.—WELL BORER.—S. H. Dickerson, Hudson, Mich.
100,610.—MACHINE FOR MAKING SASH.—S. C. Ellis, Jersey City, N. J.
100,611.—COMBINED HAY KNIFE AND PRUNING HOOK.—D. Fasig, Rowsbury, Ohio.
100,612.—BALANCE SLIDE VALVE.—James Fitzgerald, Brooklyn, N. Y.
100,613.—POLE ASCENDING APPARATUS.—George Fleming, New York city.
100,614.—CORD HOLDER FOR WINDOWS, ETC.—G. S. Gladding, Cuester, Conn.
100,615.—HARVESTER RAKE.—William F. Goulding, Providence, R. I.
100,616.—DOOR RETAINER.—Charles T. Gravatt, Philadelphia, Pa.
100,617.—MACHINE FOR REFITTING CONICAL VALVES.—C. F. Hall, Brooklyn, N. Y.
100,618.—ELASTIC PROTECTOR FOR HORSES' FEET.—W. H. Hall, Boston, assignor to himself and Joseph W. Haskins, Charlestown, Mass.
100,619.—VARIABLE CUT-OFF VALVE GEAR.—Wm. Harsen, Green Point, N. Y.
100,620.—FARM GATE.—Calvin Hart, Farmington, Ill.
100,621.—PAPER-BOX MACHINE.—C. B. Hatfield, Philadelphia, Pa., assignor to himself, Horace B. Heilman, Joseph Willcox, and H. B. Willcox.
100,622.—SELF-WAITING TABLE.—W. W. Hawley, Mount Morris, N. Y.
100,623.—WATER GATE.—Marshal Hays, Fostoria, Ohio.
100,624.—PLOW.—Daniel Heiges, Cashtown, Pa.
100,625.—SLIDE VALVE.—Abraham Hemingway, New York city.
100,626.—CARRIAGE SPRING.—Benj. T. Henry, New Haven, Conn.
100,627.—BOBBIN FOR SEWING MACHINES.—J. B. Herreshoff, Bristol, assignor to G. A. Williamson and Samuel T. Shattuck, Providence, R. I.
100,628.—ASPIRATOR FOR PREVENTING OVERHEATING OF GRAIN, ETC.—T. A. Hoffman, Beardstown, Ill.
100,629.—TREATING BLOOD FOR THE PREPARATION OF FERTILIZERS, AND FOR OTHER PURPOSES.—H. A. Hogel, New York city, assignor to himself and C. G. Bruce.
100,630.—MACHINE FOR PUNCHING THE LEAVES OF ELLIPTIC SPRINGS.—George Hopson, Bridgeport, Conn.
100,631.—HOLLOW GRATE FOR STEAM BOILER.—C. E. Hutson, Commerce, Mo.
100,632.—HEAT-RESISTING MATERIALS FOR SAFES, BANK VAULTS, ETC.—Theo. Hyatt, New York city.
100,633.—DEVICE FOR PACKING AND TRANSPORTING EGGS.—Benj. Illingworth, Freeport, Ill.
100,634.—CHECK FOR GAS BURNERS.—J. H. Jennings, New Bedford, Mass.
100,635.—SPRING BED BOTTOM.—T. W. Johnston, Richmond, Me.
100,636.—FURNACE FOR DRYING SAND.—I. D. Johnson and A. V. Hartwell, Chicago, Ill.
100,637.—LAMP CHIMNEY.—Edward Jones, South Boston, Mass.
100,638.—TABLET, TOKEN, OR CHECK, TO BE USED IN LIFE INSURANCE.—H. A. Jones, Brooklyn, N. Y.
100,639.—PEANUT CLEANING AND POLISHING MACHINE.—J. M. Keating, Norfolk, Va.
100,640.—MUCILAGE HOLDER.—James M. Keep, New York city.
100,641.—STOVEPIPE DAMPER.—William J. Keep, Troy, N. Y.
100,642.—CLAMP.—G. D. Lambert, New Haven, Conn.
100,643.—MOTIVE POWER FOR CARRIAGES.—S. L. Langdon, New Orleans, La.
100,644.—PADLOCK.—T. Lanston, Washington, D. C.
100,645.—FLUTING MACHINE.—T. Leavitt and E. L. Howard, Malden, Mass.
100,646.—CARRIAGE AXLE.—W. A. Lewis, Joliet, Ill.
100,647.—TREATING LIQUOR CONTAINING GELATIN OR GLUE.—Orazio Lugo, Baltimore, Md.
100,648.—WATER WHEEL.—Samuel Martin, York, assignor himself and B. F. Manifold, Lower Chanceford, Pa.
100,649.—FLATIRON POLISHER AND HOLDER.—W. B. Mason, Boston, Mass.
100,650.—HORSE HAY FORK.—J. M. McDonald, McCoysville, Pa.
100,651.—SAFETY MECHANISM FOR HOISTING APPARATUS.—W. H. Merrick, Philadelphia, Pa.
100,652.—COMPOUND FOR STUFFING LEATHER.—J. Merrill, Boston, Mass.
100,653.—LAMP BURNER.—Rufus Spaulding Merrill, Cambridge, assignor to himself, William B. Merrill, and Joshua Merrill, Boston, Mass.
100,654.—MACHINE FOR TURNING BALLS OR MANDRELS.—William Newsham (assignor to Morris, Tasker & Co.), Philadelphia, Pa.
100,655.—CULTIVATOR.—Walter Notman, Deerfield, Ohio.
100,656.—CARD RACK.—Leverett H. Olmsted, Brooklyn, N. Y.
100,657.—DISH WASHER.—Merrill S. Orton and P. B. Stiles, Galesburg, Ill.
100,658.—PAPER BOX.—Bennett Osborn, New York city.
100,659.—EMERY WHEEL.—J. L. Otis, Leeds, Mass.
100,660.—SAWING MACHINE.—Andrew G. Park, Leon, N. Y.
100,661.—COMBINED LATCH AND LOCK.—Frank P. Pfleghar (assignor to himself and McLagon & Stevens) New Haven, Conn.
100,662.—CLOTHES DRYER.—Russell Phillips, Boston, Mass.
100,663.—MODE OF SUSPENDING MIRRORS TO FURNITURE.—Levi Pierce, Charlestown, Mass.
100,664.—DITCHING MACHINE.—Willard Pierce, Truxton, N. Y.
100,665.—UNION COUPLING FOR PIPES.—R. M. Potter, Jersey City, N. J.
100,666.—TELEGRAPH POLE.—E. Freeman Prentiss, Philadelphia, Pa.
100,667.—POTATO DIGGER.—Wm. R. Prince, Parkersburg, West Va.
100,668.—MANUFACTURE OF ILLUMINATING GAS.—A. C. Rand (assignor to William J. Nichols, Alden B. Rand, and Richard H. Brown), New York city.
100,669.—REVERSIBLE SHIRT.—Charles O. Richter, New York city.
100,670.—DYE VAT.—T. E. Rogers, Dexter, Me.
100,671.—LUBRICATING THE TRAVERSING GUIDE IN MACHINES FOR FEEDING CARDING ENGINES.—Bozil S. Roy, Olneyville, R. I.
100,672.—MORTISING MACHINE.—Anton Schmackers, Cincinnati, Ohio, assignor to Lane & Bodley.
100,673.—WATER-CURRENT MOTOR.—J. Q. A. Schoonover (assignor for one half to J. S. Totten), Lebanon, Ohio.
100,674.—STUMP EXTRACTOR.—Henry Schwartz, Fayetteville, Ohio.
100,675.—STOP MOTION FOR SPOOLING MACHINES.—Samuel Semple, Jr., Mount Holly, N. J.
100,676.—FRUIT TRANSPORTATION BOX.—Walter Shaw (assignor to himself, Jonathan Vincent, and Seldon R. Redman), Newfane, N. Y.
100,677.—HEEL OF RUBBER BOOTS AND SHOES.—F. M. Shepard, New York city.
100,678.—SOLE OF RUBBER BOOTS AND SHOES.—F. M. Shepard, New York city.
100,679.—WOOD-SPLITTING MACHINE.—R. D. Silverwood (assignor to Wm. Silverwood), Baltimore, Md.
100,680.—SPOON HOLDER AND BELL.—Samuel Simpson Wallingford, Conn.
100,681.—APPARATUS FOR REFRIGERATING AND PRESERVING.—D. E. Somes, Washington, D. C.
100,682.—COOLING AND PRESERVING TANK.—D. E. Somes, Washington, D. C.
100,683.—APPARATUS FOR COOLING AND PRESERVING.—D. E. Somes, Washington, D. C.
100,684.—GAS MACHINE.—Theodor G. Springer, St. Louis, Mo.
100,685.—MACHINE FOR BENDING FELLIES.—D. A. Sprinkle, Leoti, Ind.
100,686.—TOOL FOR LACING BELTS.—J. M. Stamp (assignor to himself and Peter Johnston), Grass Valley, Cal.
100,687.—HAY AND COTTON PRESS.—George W. Swift, Memphis, Tenn., assignor to himself and E. G. Graham, De Soto county, Miss.
100,688.—ROOFING COMPOUND.—F. C. Tegeithoff, Cleveland, Ohio.
100,689.—MANUFACTURE OF ICE AND COOLING AIR, LIQUIDS, ETC.—Charles Tellier, Paris, France, assignor to Leopold Bouvier, New York city.
100,690.—GROOVING CHISEL.—H. G. Terwilliger, Scranton, Pa. Antedated February 28, 1870.
100,691.—SUN DIAL.—L. I. Trueg, St. Vincents, Pa.
100,692.—DAMPER.—J. P. Tuttle, Warren, Ohio.
100,693.—RAILWAY RAIL SPLICE.—Jacob Valentine, Bound Brook, Francis Harris, Jr., Elizabethtown, N. J., and C. Barnes, New York city, assignors to D. R. Pratt, New York city.
100,694.—SASH HOLDER.—A. Van Patten and J. F. Kelsey, Weyauwega, Wis.
100,695.—PLANING MACHINE.—Loudus B. Walker, Chicago, Ill.
100,696.—PLOW.—L. T. Webster, Northfield, Mass.
100,697.—SELF-CLOSING AUGER STOP COCKS.—Alfred Weed, Boston, Mass. Antedated Feb. 25, 1870.
100,698.—SPRING BED BOTTOM.—William Wells, Salem, Mass.
100,699.—CONSTRUCTION OF STOVE PLATES.—August Wernet and John Kershaw, Canton, Ohio.
100,700.—FLOOR CLAMP.—George Wood, Philadelphia, Pa.
100,701.—COLLAR AND HAMES.—J. L. Wooden, Greensburg, Ind.
100,702.—PUMP.—Wm. Wright, New York city.
100,703.—MUFF AND COLLAR BOX.—Henry Fowler, Detroit, Mich., assignor to Jason Crane, Bloomfield, N. Y.
100,704.—DOVETAILING MACHINE.—Henry H. Bashore, Philadelphia, Pa.
100,705.—CONSTRUCTION OF CHIMNEYS AND FLUES.—Joseph Kleckner, Mottville, Mich.
100,706.—CEMENT TO BE USED IN SEWERS AND DRAINS, AND FOR CONSTRUCTING FLUES AND OTHER PARTS OF BUILDINGS.—J. Kleckner, Mottville, Mich.
100,707.—RAILWAY SWITCH.—Joseph J. Shaeffer and Curtis C. Steinmetz, Middletown, Pa.

REISSUES.

3,869.—WATCHMAN'S TIME DETECTOR.—Jacob E. Buerk, Boston, Mass., assignee of John Burk.—Patent No. 31,052, dated January 1, 1861; patented in France, Oct. 29, 1856; reissue 2,054, dated August 22, 1865.
3,870.—TUMBLER WASHER.—G. D. Dows and Calvin Dows, Boston, and G. S. Cushing, Lowell, Mass, assignees, by mense assignments, of Albert Hallowell.—Patent No. 52,565, dated February 13, 1866.
3,871.—PACKING CASE FOR TOBACCO.—S. F. Hess, Rochester, N. Y.—Patent No. 99,188, dated January 25, 1870.
3,872.—APPARATUS FOR THE MANUFACTURE OF GAS.—W. J. Nichols and A. C. Rand (assignees, by mesne assignments, of L. D. Gale, assignors to W. J. Nichols, A. B. Rand and R. H. Brown), New York city.—Patent No. 26,028, dated November 8, 1859.
3,873.—MANUFACTURE OF GAS.—W. S. Nichols and Alonzo C. Rand (assignees, by mesne assignments, of L. D. Gale, assignors to W. J. Nichols, A. B. Rand, and R. H. Brown), New York city.—Patent No. 26,030, dated November 8, 1859.
3,874.—CORN STALK CUTTER.—G. W. Cole, Farmington, Ill.—Patent No. 39,214, dated July 14, 1863.
3,875.—WATER WHEEL.—William Foos, John W. Bookwalter, Mary A. Leffe), Springfield, Ohio, and Lamar Foos, New Haven, Conn., assignees, by mesne assignments, of D. K. Kraatz.—Patent No. 20,921, dated July 13, 1858.
3,876.—HORSE HAY FORK.—J. K. O'Neil, Kingston, N. Y.—Patent No. 55,528, dated June 12, 1866.
3,877.—LIME KILN.—C. D. Page, Rochester, N. Y.—Patent No. 22,239, dated December 7, 1858.

DESIGNS.

3,881 and 3,882.—"BEDOUIN" OR "ARAB."—Thomas Dolan, Philadelphia, Pa. Two Patents.
3,883 and 3,884.—TACK HEAD.—George A. Field (assignor to the Albert Field Tack Company), Taunton, Mass. Two Patents.
3,885.—TOP PLATE, BARREL BRIDGE, AND COCK FOR WATCHES.—Fayette S. Giles (assignor to Giles, Wales & Co.), New York city.
3,886.—BARRED BRIDGE, RATCHET-CAP BASE, AND ARBOR CUP OF WATCHES.—F. S. Giles (assignor to Giles, Wales & Company), New York city.
3,887.—TRADE MARK.—O. C. Maxwell, T. L. Neal, and C. L. Long, Dayton, Ohio.
3,888.—CLOCK FRONT.—Nicholas Muller, New York city.
3,889.—TRADE MARK.—George C. Thilenius, Cape Girardeau, Mo.
3,890.—TEA SET.—H. Vasseur (assignor to Simpson, Hall, Miller & Co.), Wallingford, Conn.
3,891.—ICE PITCHER.—H. Vasseur (assignor to Simpson, Hall, Miller & Co.). Wallingford, Conn.
3,892.—CARPET PATTERN.—Hugh Christie, Morrisania, N. Y.
3,893.—SPICE MILL.—Wm. Haslam (assignor to Henry Troemner), Philadelphia, Pa.
3,894.—COLLAR BOX.—John R. Jerauld and Henry L. Holmes, Providence, R. I.

EXTENSIONS.

ORE WASHER.—W. L. Carter, of Marietta, Pa.—Letters Patent No. 14,388, dated March 11, 1856.

[Communicated].

ROTATING AND FIXED TURRETS.

To the Editor of the New York Times:

Please publish the following communication, which has been declined by the editors of the *Army and Navy Journal*, to whom it is addressed.

JAMES B. EADS.

ST. LOUIS, January 29, 1870.

Editor of the Army and Navy Journal:

SIR:—Your editorial contributor of the article published in your journal on the 1st of January, and entitled "Rotating and Fixed Turrets," seems to know that the defects of the monitors are becoming so well understood that their claim to be considered *invulnerable* cannot be supported either by their record or by the intrinsic merits of their design. He evidently thinks but one way is left to save the system from public disfavor and that is by clamoring about the ignorance of those who have the temerity to doubt its superiority over every other.

Your contributor makes no denial of the justice of my criticisms when applied to the monitors provided with *base rings*, supported as they were by proofs from official reports; but admits that "the original small craft which served us so effectually during the war, possessed defects, which in later structures have been nearly overcome, and which in future structures may be wholly removed." He says, "these cardinal objections urged on Mr. Eads' system of naval defense, are wholly groundless as regards the *Dictator*. It was not this vessel, it appears, but the original batch of small monitors, which Mr. Eads criticised," and tells us "that these objections have been removed in the *Dictator* and *Puritan* classes, and consequently in the *Kalamazoo* class of turrets." He says: "The *base ring* which was attached to the small monitors because the thin turret plating was found inadequate, a matter to which Mr. Eads devotes much space, we deem it waste of time to discuss. All that need be said is that the *Dictator* and *Kalamazoo* class of turrets *were built* (these *italics* are mine) on a plan requiring no ring at the base."

From these extracts it is evident he abandons the attempt to defend the vessels provided with *base rings*. These constitute the *Monadnock*, *Canonicus*, *Passaic*, and *Yazoo* classes, nearly forty monitors, all of which he leaves *hors du combat*, and concentrates his entire energies in defending the monitor system with the turrets of the *Dictator* class, the *Puritan* class and the *Kalamazoo* class. I therefore leave "the original batch" to survey the field occupied by these invincibles. How many remain, then, of these undemolished and acknowledged representatives of the monitor system? Will your readers, after all this ado about how our *Kalamazoo* class of turrets "*were built*," and all the bombast about the *Puritan* class, and the *Dictator* class, credit the fact that excepting the *Dictator*, there is not at this time, and never has been, a turreted vessel of either class in existence?

I once read of an urchin at school (not "one of our young friends at West Point and the Naval Academy"), who, having his coat closely buttoned up, was asked, "Where is your shirt?" "Mother is washing it." "Have you but one shirt?" continued the astonished interrogator. To which the indignant lad replied, "Would you expect a body to have *a thousand* shirts?" When your contributor is asked, "Have you but one of these wonderful vessels?" I can imagine his indignation as he replies, "Would you expect a body to have *a thousand Kalamazoos?*"

I shall not quarrel, however, with him because of the paucity of his *Kalamazoos*, but will briefly proceed to examine the merits of his last remaining hope—the *Dictator*. I will first state, however, that the turrets of the *Puritan* and the *Kalamazoo* classes, which he takes so much pains to tell us, "*are composed* (my italics again) of two distinct cylinders of plate iron," have never been constructed at all.

The Department is even now maturing plans for completing as casemated ships the vessels constituting these classes which were commenced several years ago, and before the defects of the *Dictator* were fully manifested. I am informed that it has already decided to do this with the *Kalamazoo* The fact that their turrets were once contracted for, and that the Department compounded with the contractors and canceled the agreements while the work was in progress, together with its subsequent course in the premises, would seem to prove its want of faith in the system; but this will, doubtless, be all explained by your contributor. The motive which prompted him, however, to endeavor to lead the public to believe these turrets "were built" and "are composed," etc., when they are not yet built, together with certain questions of ethics, to which the use of these deceptive phrases give rise, I leave for him to settle with your readers, while I proceed to examine the merits of the *Dictator*. The impregnability of the joint between the base of the pilot house and the turret roof of the *Dictator* is thus set forth by your contributor: "We stated in our article that shot could not strike the base of the pilot house [of the *Dictator* because the turret wall of that vessel (we might have added the turrets of the *Kalamazoo* class) is carried to such a hight that shot cannot thus strike." The top of her turret wall is 26½ feet in diameter. The pilot house placed in the center of it is not over ten feet. This leaves about 8 feet all round from pilot house to turret wall. The turret wall of the *Dictator* is projected only six inches above the turret roof, consequently a roll of the ship of four degrees would bring the top of the turret wall below the level of the base of the pilot house.

This protection would then cease to exist against shot moving in that horizontal plane, and this plane would be no higher than the guns of several English iron-clads already afloat. To make this boasted protection available against them at short range, it would be necessary that the contest be fought on a perfectly smooth sea. Even in such a sea, this six-inch belt would be too low to protect this joint against their guns if they were only a few hundred yards distant, for the elevation of three or four degrees re

quired by the distance would so increase the curvature of the trajectory of the shot as to insure its passing over the turret wall, it being only high enough, when perfectly level, to intercept projectiles intersecting the line of fire at an angle of less than four degrees. In attacking forts it must be manifest that this joint would be exposed to the direct fire of any gun four degrees above it.

Even in a calm sea, a gun on a level with it or even below it, would command this joint, if it were sufficiently distant to require a few degrees of elevation to maintain the trajectory above the line of fire to the requisite distance. It is therefore ridiculous; to claim that this joint is impregnable against fortifications. To make it a tall available against an enemy afloat involves the necessity of a smooth sea, and of the *Dictator* selecting and maintaining her own position in the fight. As she is known to be a complete failure in point of speed, making only seven knots per hour, of course this would be impossible with almost any English iron-clad afloat, none of which have a speed of less than nine knots, while several go at thirteen or fourteen. It is therefore evident that this six-inch belt projected above the turret roof is too insignificant a defense of the joint to merit serious consideration. My apology for devoting so much space to it is that it is claimed to be so important. If it must continue to form a characteristic feature in the monitor system it is essential for the advocates of the system to insist that the rules of the prize ring be adopted in naval engagements, and that it be expressly understood that hits on the pilot house below the belt shall be unlawful, and will entitle the monitor to claim the stakes.

Your contributor maintains that it is impossible for any heavy projectile to disturb the inertia of the *Dictator's* pilot house, weighing eighty thousand pounds, and held in place by a fourteen-inch spindle. He asserts, therefore, that it would not be bent over, and thereby endanger the rotation of the turret beneath it, nor be liable to be lost overboard by the fracture of the spindle. In support of my assertion to the contrary, made in my report to the Secretary of the Navy, and ridiculed in your contributor's article on the *Moyni Zaffer*, I quoted the report of Captain Drayton, of the *Passaic* (page 61, "Armored Vessels"), and proved by it that a half-spent riocheting rifle shot (after breaking all of the eleven one-inch plates of the upper part of her turret) had sufficient force left to "mash in the pilot house" and "bend it over."

To avoid the inevitable conclusion that a direct blow from a heavy projectile can *bend over* and disable the forty-ton pilot house on the *Dictator*, if the shot described by Captain Drayton could bend over the twenty-four-ton pilot house of the *Passaic*, similarly secured, this able physicist gravely tells your readers that "The Commander of the *Passaic* had no idea of saying that the *pilot house*, as Mr. Eads appears to suppose, had bent over; the top of the wall had simply bent over by the effect of a glancing shot," and thinks "this singular error of Mr. Eads has probably been noticed by our young friends at West Point and the Naval Academy." Captain Drayton said: "The blow was so severe as to considerably mash in the pilot house, bend it over, open the plates," etc. These young gentlemen will probably think that, as Captain Drayton had already said, the pilot house was considerably "mashed in," it was surplusage to state in the same sentence that "the top of its wall had been bent over" also. Yet this is what your contributor would make them believe he meant to say. It is probable there are not twenty students at the Naval Academy who could not have told this conscientious writer (what he was evidently ignorant of), viz., that the report of the Commission appointed by Mr. Welles to examine and report upon the injuries to the *Passaic*, and published on page 33 of "Armored Vessels," would cover him with confusion for this attempt to distort the plain meaning of a gallant but deceased sailor. For the *words* of Captain Drayton are fully corroborated in that report. This Commission (composed of Captain J. C. Rowan, U. S. N., Charles W. Copeland, George W. Quintard, M. F. Merritt and Jos. J. Comstock) states that the shot in question "raised the pilot house half an inch and *started it over on one side*, breaking two bolts in the pilot house." The italics are my own, the words are those of the report.

Your contributor merits all the glory he has gained by this attempt to destroy the effect of the gallant Drayton's words, in this effort to sustain the ridiculous proposition that the inertia of forty tuns of iron cannot be disturbed by a cannon shot of such weight and velocity as was known to be practicable at the date of the *Dictator's* construction. Arguments, based upon such absurdities, must require unusual expedients to sustain them. If he still doubts that this comparatively light shot did really overcome the inertia of a twenty-four ton pilot house, after being told by one witness that it *bent it over*, and by five others that it *raised it half an inch and started it over on one side*, I can give him other official proof of the power of shot to move monitor pilothouses.

Being engaged from the inception to the close of the rebellion in designing and constructing armored vessels, I was kept promptly and confidentially advised by the Department of "the most important facts" connected with the performance of the monitors and other ironclads; and although charged by your contributor with being ignorant of the subject, may be able to refer him to some other reports that will also be new to him.

Your contributor lays a great stress upon the fact that the gun slides of the *Dictator* do not touch the turret wall, and consequently the disabling of the guns cannot occur from shot striking opposite their ends.

The Commission before referred to, speaking of an accident of this very kind, by which one of the *Passaic's* guns was rendered useless, and certain damages done to the joint at the base of the turret, says: "We would take the liberty of suggesting that this form of injury may hereafter be guarded by fastening a very heavy ring or band around the base of the turret to prevent distortion, and leaving sufficient freedom between the rails of the carriage and the turret, so that any slight distortion of the turret will not effect the gun carriages."

It appears that the suggestion of this intelligent Commission was not deemed large enough for the entire monitor navy, for we find only one half of it used on "the original batch," and the other in the Dictators, Puritans, and Kalamazoos that "were built" on a plan not requiring a base ring. The originals had the ring with the long gun slides, and the last three classes the short gun slides without the rings.

It seems not to have been noticed that one of the chief objects of this practical Commission, in recommending the use of a heavy band around the base of the turret, was to prevent the *distortion*, which those gentlemen foresaw was likely to occur to it if robbed of the eight important points of support in its circumference furnished by the four gun slides, which are placed about four feet apart in the base of the turret, and transversely over the main turret beam through which the vertical spindle passes.

When these should no longer touch the turret wall, it would have nothing except the ends of the main beam, bolted to its base at two opposite points in its circumference, to preserve its circular shape at the deck. These gentlemen doubtless thought that the turret would then be likely to lose the cylindrical, and assume the "partially oval form," if struck by even as small shot as that which mashed in the *Passaic's* pilot house. But they were merely "superficial observers," and had not been taught by your contributor that "a partially oval turret would work upon a broad flat ring as well as one that is cylindrical." They probably thought that a heavy shot at the base might bend the bottom of the wall in without moving the top of it in also, and thus cause an ugly leak, even if it did not stop the turret's rotation, and that its "distortion" might, to some extent, be guarded against by a heavy base ring.

The turret of the *Dictator's* is 24 feet in its internal diameter. Its wall is 15 inches thick, and it is not enlarged or in any way strengthened at the base.

The turret walls of "the original batch" were eleven inches thick. The bands placed around their bases were five inches thick by twelve or fifteen inches in hight. Including this band, those turrets are consequently one inch thicker at the base than the *Dictator's*.

The *Dictator* has a series of similar five-inch bands, one above the other, incorporated into the construction of her turret, the lower one of them being six inches thick (one of the ten thin plates being cut short to allow for its extra inch of thickness). In my letter I proved from official reports that the base ring about the monitors failed to give adequate protection. The heaviest shot thrown against them were from ten-inch columbiads. These shot weighed only 128 pounds. Yet they were found sufficient to disable a turret sixteen inches at its base, including the base ring. Now is it not a most egregious absurdity to claim that the *Dictator's* turret, not as thick at the base by one inch, is invulnerable against fifteen-inch shot weighing three and one half times as much.

And is it not equally absurd to claim that this wall, resting on a flat, level surface, and in no way secured from being knocked into a "partly oval shape," except at only two points in its entire circumference of 83 feet, should have sufficient stiffness and inertia to prevent its being distorted more than two inches? For two inches is the entire distance existing between the turret wall of the *Dictator* and the ends of her gun-slides. This enormous space of two inches is the basis upon which their claim to impregnability is resting. The feeling of security which possesses your contributor on the gunslide question can only be equaled by the ostrich, who having thrust his head under cover a few inches, thinks everything is then absolutely safe.

Your contributor says: "Critics all point to the disastrous consequences of shot striking at that junction [the base of the turret]; but they do not appear to comprehend the practical merits of the expedient of rotating the turret on a flat ring, level and parallel with the deck." Of course they do not, without a great deal of study, because it is such a very intricate and difficult problem. It might be worked out, though, by the imaginary calculus, if it failed to be solved by the differential or integral. Equally incomprehensible is the proposition, to ordinary minds, that the base of the *Dictator's* turret is safer without a heavy ring to prevent its distortion than with it; and that a fixed turret, joined firmly to the deck "will, owing to the rigid nature of the connection, inevitably produce fracture and leak," from the impact of a heavy projectile, while the same shot would be harmless against the base of the same turret if it was not joined to the deck, but only stood "on a *flat ring*, level with the deck," that would allow the turret to assume the oval or cylindrical form, just as the force of the shot moved it. Neither leak nor harm to the gun slides, two inches distant within it, could possibly occur. "Casual observers" fail to see "the practical merits of the expedient," however, and the records of the "original batch" do not quite support these propositions.

One of the great merits claimed for the *Dictator* is her remarkable steadiness in a seaway. "The sea breaks over their low, flat decks powerless for harm," exclaims their enraptured advocate. He might have added, "and their guns are equally powerless," for the *Dictator's* ports, being but two feet ten inches above her low, flat deck, they must, of course, be kept closed at such times. In consequence of the small exposure of hull above water, a small quantity of armor will clad her sides, and for the same reason a small amount of leakage will send her to the bottom. If we cannot gain immunity from the enemy, who is rarely with us, without increasing the danger of foundering, which is always present, had we not better take our chances behind thinner armor? Perhaps, as suggestive a lesson in the science of naval defense as can be drawn from our late conflict, would be a comparative statement showing the actual loss of life on our armor casemated vessels, caused both by the fire of the enemy and the foundering of the vessels, and the loss of life from the same two causes in the monitors. I am confident that whether this comparison be made according to tunnage, weight of metal thrown in action, cost of the ships, or number of men engaged in them, the loss of life will be found to have been greater on the monitors than on the others; while there is not a sailor afloat or ashore but would deem death in battle far more preferable to the fate of those who went down on the ill-fated *Weehawken*.

The overhang of the *Dictator* is another one of the defects of this vessel, though it has been claimed as one of her greatest perfections.

The amount of impenetrability given by these three or four feet of timber backing projecting out from her sides, is obtained by a sacrifice of speed which makes her terrible ramming projection at the bow a most ridiculous appendage; for the possibility of using it, the vessel never having been able to make over seven knots per hour, is so funny as to "amuse our young friends at West Point and the Naval Academy." This ram, so curiously wrought, and of length sufficient to pierce the most powerful enemy through and through, is only dangerous to the friendly ship that tows her along, as she goes cruising on the high seas, and chasing the enemies of the Republic. A Mormon elder, about to mount a dilapidated steed, was asked what he intended to do with it? On replying that he intended to follow the Lord on him, his interrogator rejoined, "You will have to push that horse right smartly before you overtake him." The *Dictator's* chances for overtaking an enemy are nearly as good. Her contract guaranteed a speed of sixteen statute miles per hour for fifteen consecutive hours, but the greatest speed shown by her steam log, in the Bureau at the Department, is only seven knots, and that but for one briefhour. "*Sic transit*," etc. As the engine and boiler power of this ship is enormous, and as almost every one of the "original batch" (without exception, I believe), failed to make the *speed* guaranteed by their contracts, I can only account for the fact, in the *Dictator's* case, by the retarding influence of this peculiar appendage, the *overhang*, coupled with the laborious duty of carrying her dangerous ram.

In summing up the wonderful qualities of this perfect specimen of the monitor system, then, we find: First—That her invulnerable turret never has been under fire. Second—That turrets as thick as hers at the base have been injured at the deck joint with projectiles scarcely more than one quarter as heavy as fifteen-inch shot. Third—That her gunslides are only secure against the lighter class of projectiles. Fourth—That similar joints on the turret roof on other vessels have been injured, and the turret stopped by light shot, while hers is only provided with an additional protection that is not available except under the most favorable circumstances, and those circumstances beyond her control. Fifth—That pilot houses similarly secured, and only sixteen tunsless than the weight of hers, have been wrecked by small and half-spent glancing shot. Sixth—That her low speed is such as to make her a helpless hulk against the submerged rams of many war vessels now afloat. Seventh—That her low ports render her unable to return the fire of an enemy, who may chance to overhaul her in a rough sea. Eighth and lastly—That her low position in the water, and the warning fate of three of her predecessors, give assurance that eternal vigilance is the price of her safety against sudden foundering.

To continue thus persistently to mislead our countrymen into the belief that such a vessel is capable of coping with some of the English ironclads now afloat, when we dare not trust her at sea alone for fear of foundering, or that we have one single armored ship (*Kalamazoo* or anything else) that can stand against them, betrays either unpardonable ignorance, or a total want of patriotism.

I have been reluctantly drawn into this discussion to defend myself against the severity of your personal strictures, and have hastily thrown these facts and arguments together with no wish to depreciate the important services rendered by the monitors in our late conflict, nor in any wise to lessen the fame of their distinguished inventor. Their merits and his genius will find in history the high place deservedly won by them in the exigencies of the hour, no matter what system of naval defense be found best suited to the present wants of the age.

I have no leisure to notice the ridicule or criticisms which you or others may choose to apply to *my system*, nor have I the right to ask your space in defense of it, but trust I shall always find time and materials, and have opportunity granted, to repel personal charges of ignorance and misrepresentation, either direct or implied, when made in a journal of respectable standing. Your obedient servant,

JAMES B. EADS.

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