

## Starboard and Port.

Since the 1st of July, of this year, the old words of command for altering the helm, viz., "starboard" or "port," have been given up on board the ships of the North German Lloyds and the Hamburg-American lines, and the order "right" or "left" substituted.

It is difficult to break with old customs, and seamen in especial are conservative; it is, therefore, not a matter of wonder that many old sailors look with great disfavor upon this latest innovation. On board the steamers of the two great lines mentioned above, however, the change has been made obligatory, and, according to a report forwarded to the directors by one of their oldest captains, who was himself opposed to the idea, has been attended with the happiest results.

As soon as the order "right" is given, the telegraph is moved to the right, the wheel is revolved to the right, the ship turns to the right, the rudder indicator points right, the rudder itself moves right, and the steering mark on the compass as well; and so *vice versa* when the order "left" is given. Nothing can be simpler, and no possibility of mistake can arise.

The objection has been raised that the new words of command are not international, and are therefore illegal. This statement, however, will not hold good, as both English and American pilots, in whom every one has confidence, have made no difficulties in using the new words of command when piloting ships of the two before mentioned companies.—*Nautical Magazine*.

## THE "ADAMSON" GUN.

The illustrations represent a sectional elevation, end view, and plan respectively of a gun invented by the late Mr. Daniel Adamson. The principal feature of this type of gun consists in abolishing the trunnions and substituting therefor a ball joint, A, or spherical enlargement, which works in a suitable socket on the gun carriage. The advantage claimed for this arrangement is that the gun—a model of which is now exhibited—can be readily trained to cover a much greater range without moving the carriage. The gun was made at Bofors, in Sweden, and, according to *Industries*, has been tested by Swedish artillerymen with the following results:

The gun was fired five times in twenty seconds. An elevation of 25 degrees was found to carry the projectile 26,250 feet, or nearly five miles. Eighty-five rounds were fired. It is stated that the gun, with even more than sufficient strength, combines great durability with respect to its weight, and that the mechanism is simple and easy to manage, and does not require experts for its handling. The leading particulars of this gun are: Caliber, 3.36 inches, length, 98.43 inches; weight, 1,200 pounds; rifling, number of grooves, 24; depth of grooves, 0.039 inch; width, 0.295 inch; width of lands, 0.138 inch; twist muzzle, 33 caliber; weight of shell, 14.77 pounds; weight of charge (black powder), 5.51 pounds; volume of chamber in case, 161.72 cubic inches; volume of bore, 796.40; muzzle velocity, 1,920 feet with black powder, and 1,970 feet with smokeless powder.

## The Tocci Twins.

The *Southern Practitioner*, an influential monthly devoted to medicine and surgery, published at Nashville, Tenn., has produced in the January number the engraving of the Tocci twins, with the description, which appeared in this paper in issue of December 12, last year. In referring to this interesting specimen of tocology, the editor states the source from which his article is derived as follows:

"The description is taken from that standard and most reliable publication, which we regard as the best journal in America or the world, the *SCIENTIFIC AMERICAN*. Having had a personal and private interview with Mlle. Christine Millie in 1860; having seen and had a personal interview with Messrs. Chang and Eng, the great Siamese twins; and in a somewhat arduous work in medicine since 1854, it has been my opportunity to see more or less of monstrosities and abnormal formations, yet I do not hesitate to class the Tocci twins as something more than remarkable. It is to be hoped that if they ever marry they will have 'two souls with but a single thought, two hearts that beat as one.'"

## Anti-Friction Bearings.

The metal of the well known patent Magnolia anti-friction bearings has been found by analysis to have the following composition:

|               |        |
|---------------|--------|
| Lead.....     | 80 lb. |
| Antimony..... | 15 "   |
| Tin.....      | 5 "    |
| Bismuth.....  | 4 oz.  |
| Graphite..... | 8 "    |
| Aluminum..... | 4 "    |

## Letters Patent for Inventions.

The origin of letters patent for inventions dates as far back as the Statute of Monopolies in the reign of James I., by which statute exclusive rights were given to the first and true inventor of a new manufacture for a term of fourteen years, provided it was not contrary to law or mischievous to the State. A patent for a useful invention is not under our law, nor, indeed, under the law of England nor any foreign country at the present day, the grant of a monopoly in the sense of the old common law. It is the grant by the government to the originator, discoverer, or inventor of a new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereon, of the exclusive right, for a term of years, of practicing that invention. The consideration for which this grant is made by the Crown is the benefit to society resulting from the invention, which benefit is conferred upon the public by the inventor: first, by the immediate practice of the invention under the patent; and, secondly, by the practice of the invention or the opportunity to practice it, which becomes public property on the expiration of the patent.

The history of patents in Canada begins in 1824, when the first patent was issued on the 8th of June to one Noah Cushing, of the city of Quebec, for a washing and fulling machine. From that date up to the year of the confederation of the Provinces, there were only 1,866 patents issued, and these comprised the patents issued by each of the provinces or colonies, which before that period had a separate patent act of its own.

Since confederation, however, a great increase has been made in the number of patents taken out in Canada, nearly 40,000 patents having been issued since then. Our valuable manufacturing, lumbering, and mining industries, fostered and protected by the national policy, have in a large measure stimulated the progress of invention in this country, and it may safely be said that the sons of this fair dominion have produced inventions the importance of which is in no de-

ers of tyrants, and the like. And if any one rightly compare them, he will find the judgment of antiquity to be correct; for the benefits derived from inventions may extend to mankind in general, but civil benefits to particular lands alone. The latter, moreover, last but for a time, the former forever. Civil reformation is seldom carried on without violence and confusion, while inventions are a blessing and a benefit without injuring or afflicting any."—*The Canadian Manufacturer*.

## The Carbonization of Wool.

The successful extracting of cotton from union cloths without injury to the reclaimed wool has led to the extension of the process to raw wool for the purpose of ridding it of burrs and other particles of vegetable matter. These burrs are very difficult to remove, and often leave a large amount of waste during the process of extraction, while, if allowed to remain, they would do incalculable mischief to the yarn. There are two methods of dealing with them in general use—one is to pass the wool through a burring machine, which beats the burrs from the wool; and the other is to destroy the burrs by carbonization. The former method is most suitable when the wool contains large burrs; but carbonization is more economical for wool containing small burrs, straw, chaff, and other small particles of matter. One drawback in using the burring machine is that many of the smaller burrs adhere to the wool after being passed through the machine, and carbonization is afterward resorted to, in order to reclaim the wool attached to them. For this and other reasons the chemical process is likely to totally supplant the burring machine in course of time. The process generally adopted is similar to the one followed in making extract wool. The burry wool is first saturated with a dilute solution of sulphuric acid, whizzed in a hydro-extractor, and afterward opened out and spread in a heated room. Here chemical action is quietly at work, the burrs are deprived of their hydrogen, and crumble to carbon, while the wool is liberated and washed.

Another method which finds favor is to saturate the wool with a solution of chloride of aluminum ( $Al_2Cl_3$ ). After being whizzed and dried, it is taken to a room heated to about 200° F., where it remains for a little less than an hour. Washing in fuller's earth and water follows, by which the chloride is removed and the residue of carbonized matter washed away. The prejudice which formerly existed against these methods of extracting burrs is rapidly disappearing, as experience has proved that if the wool be properly clean previous to carbonization, and the acid the required strength, no injury to the fiber is caused, neither is the felting of the wool in any way destroyed.

## Convention of the National Association of Inventors.

On January 19 of the present year, the National Association of Inventors held their first annual meeting. This body is the outcome of the Patent Centennial which met at Washington last winter. The list of officers includes distinguished names. The President, Dr. Gatling, of Hartford, Conn., known as the inventor of the Gatling gun, occupied the chair, and was the writer of the presidential address, which was read by the Commissioner of Patents, Hon. George E. Simonds. Other officers of the association are as follows: Vice-Presidents, Hon. Gardner D. Hubbard, president of the American Geographical Society; Wm. A. Anthony, president of the American Institution of Electrical Engineers; Thomas Shaw, of Philadelphia, inventor; and Hon. Benjamin Butterworth, secretary of the World's Fair; Secretary, Prof. J. E. Watkins; Treasurer, Mr. Martin E. Stone.

The president's address touched upon the propriety of liberal treatment of inventors, the necessity for increasing the number of Patent Office examiners, and the necessity of a special patent court. The World's Fair and the exhibition of the results of American invention were also spoken of. Informal discussions of the work of the two main committees on legislation and manufactures occupied much of the time of the meeting, and finally an adjournment was taken for one year, to meet again in Washington.

A WELL known business man, referring to the success of his firm, said: "We attend to our own business and nothing else. You never hear of any of us being on the road nor out driving. We do not go to the theater. We have no outside business—no ventures or speculations in oils, wild lands, patents or stocks. What money we have we have put into our house. We take care of our business and our business takes care of us. We keep abreast of the time."

gree inferior to those of our neighbors south of us. Such is the enterprise of Canadians that patents for important inventions are now being taken out by them not only in Canada, the United States, and England, but in the various colonies of the empire, and in many foreign countries.

Patents are granted in Canada for a term of fifteen years. The first government fee is \$20, which fee protects the invention for five years, two further fees of \$20 for each succeeding five years being requisite in order to protect the invention for the full term. It is, therefore, necessary to pay the first fee in order to obtain the patent, and the subsequent fees in order to keep it alive the full term. Two other requisites are necessary in order to keep the patent alive, namely, the article covered by the invention must be manufactured within two years from grant, and it must not be imported for more than a year. Specifications, drawings, and models are required to be sent to the Canadian Patent Office before a patent will be granted, and such is the importance of having inventions thoroughly covered, in order to protect the inventor from infringement, that special experts are employed by inventors, so that their applications may be prosecuted to a successful issue before the Patent Office. It is essential that men having a legal as well as a mechanical experience should be employed.

Many people are in the habit of not only thinking of, but speaking of, inventors as cranks. But when one considers the advantages reaped from the indomitable energy and perseverance of such so-called cranks, it must be confessed that to that class of the community we are more indebted than to any other.

Lord Bacon corroborates this statement in the following:

"The introduction of great inventions appears one of the most distinguished of human actions, and the ancients so considered it; for they assigned divine honors to the authors of inventions, but only heroic honors to those who displayed civil merit, such as the founders of cities and empires, legislators, the deliverers of their country from lasting misfortunes, the quell-