THE LAUNCH OF THE ST. LOUIS OF THE AMERICAN LINE.

In a recent issue of the SCIENTIFIC AMERICAN (August 11, 1894), we described and illustrated the steamship St. Louis, of the American Line, under process of construction by the Cramp Company, of Philadelphia. Embodying American ideas, and built under the strongest incentives afforded by international rivalry, there is little doubt that the St. Louis and its sister ship will surpass anything of their size afloat.

We reproduce in this issue the scene at the launching, which took place on November 12, when the great ship, in the presence of a vast throng, amid cheers and the booming of cannon, slid down the ways into the Delaware River, christened by Mrs. Cleveland, who broke over its bows a bottle of American champagne. It is estimated that from forty thousand to fifty thousand people were present.

The ship as it stood on the ways was red below the water line and black above it, and was decorated with flags in great variety. Nearly 500 workmen drove the wedges; the upper ways were sawed through, and at about 1 P. M. the ship took the water. The pitch of the ways was $\frac{11}{16}$ inch to the foot, and the hull as launched weighed over 6,000 tons. There was a collation served after the launch to nearly two thousand guests, including the President and many others of note in the political and naval worlds.

Early in the seventies four transatlantic steamers of the State Line were launched at Cramps' yard. Now, after some twenty years interval another one is put into the water, and in the spring the St. Paul, the sister ship, will be launched.

Construction was begun on the St. Louis July 27, 1893. She is to accommodate over 1,300 passengers and a crew of nearly 400 officers, sailors, engineers, firemen, etc. She must show over twenty knots sea speed, according to the post office contract with her owners. One of her details alone is enough to indicate what a complex affair the modern steamship has become, for besides her main engine there are forty-nine auxiliary engines for every conceivable purpose. The bulkheads are so distributed that it is believed that the ship is practically unsinkable.

In size and engine power the new ships will come between the Campania or Lucania and the Teutonic or Majestic. It is hoped that the St. Louis will be in service next June. Expectancy regarding her performance will run very high.

Our view shows in the foreground the war ship Minneapolis. Thus there are brought together the last accession to the navy and the St. Louis, the beginning, it is to be hoped, of America's new mercantile marine. Each is a worthy representative of the best of their respective types.

DR. OSLER, of Johns Hopkins, says that pneumonia can neither be aborted nor cut short. It is a self-limited disease and runs its course uninfluenced by any medicine we might administer.

Tobacco Cultivation in Cuba.

Pinar del Rio, the western province of Cuba, is given up almost entirely to the cultivation of tobacco. The plantations are scattered about in all directions, generally a mile or two apart. They consist of a number of small fields ("vegas") of about ten acres each, selected wherever the land is richest. The most of the land is entirely uncultivated. The tobacco seed is sown in nurseries, about ten pounds being used per acre. In October and November the young plants, when about three inches high, are bedded out in the tobacco fields, in furrows two feet apart. During the three months the plants take to reach their full size the greatest care is taken of them. Each plant is constantly examined, the green tobacco caterpillars killed, and the furrows kept perfectly clean with the plow. When the plant has grown its big leaves, generally about ten in number, all the small leaves are picked off the stalk, and on reaching its full height the head of the plant is also picked off. This allows the leaves to expand and spread out in the sun. The female plant gives the best leaves for capas (the outside wrapper of a cigar), as the leaves are larger and stronger. The color of the leaf is bright green until ready for picking, when it begins to turn yellow and spotty. They are then gathered by cutting the stalk in such manner that two leaves remain on each piece of stalk. The leaves are then strung over thin poles in the drying houses, one leaf each side of the pole, and left to dry about five weeks. The drying houses are large, airy barns, thatched with palm leaves, the inside being arranged with rows of poles one above another. On being taken down the leaves are put together in bundles of about 100 leaves, which are made into bales of usually eighty bundles and wrapped up in palm leaves. The bales are then ready for sale, and are taken in this state to the storing rooms of the cigar manufactories in Havana.—Consular Report.

Electric Conduit Roads.

At a recent meeting of the New York Electrical Society, Mr. Sachs gave a very intelligent description of what has been done in the past and what might be expected in the future. His paper received a full and exhaustive discussion of the problems involved, in which many of the very best authorities in this country took part.

The general consensus of opinion among those present was that there was no difficulty in constructing a conduit road that would work. Our own belief and contention, says Electricity, is that there is scarcely an electrician in the country but will deny that there are any mechanical or electrical difficulties that are insuperable. The mechanical difficulties are greater in the conduit than in the overhead system, but they can be overcome, if enough money is spent in the solution. The electrical difficulties are greater in the conduit than overhead, but if the conduit be made large enough, and the voltage be made low enough (which means, of course, more copper), these difficulties also may be overcome; so the question resolves itself in all directions into one of money. There is probably scarcely a practicing electrical engineer in the country who if asked if it were possible to construct an operative electric road upon the conduit plan, that would not answer unhesitatingly, "Yes." Why then has not this method become more popular? Simply because it is in competition with a better method. There is but one single feature of the conduit that recommends it above the overhead trolley, and that is one that appeals to the æsthetic side of our natures alone. In all other particulars the overhead system stands facile princeps. It is cheaper to construct; it is simpler, both mechanically and electrically; it gives better service and, more important for its survival than anything else, it is a better dividend payer. What incentive, therefore, is there to capital to an investment of half a dozen or more times the money for something which in its ideal perfection can only hope to equal that which we have already? Very little or none.

The Tallow Tree.

This tree is variously known as "tallow wood" (owing to its greasy nature when freshly cut), "turpentine tree," and "peppermint"—the foliage being remarkably rich in volatile oil. Another local name applied to it is "red shingy bark," owing to its red fibrous bark. Its botanical name is Eucalyptus microcorys. The term microcorys is made of two Greek words signifying "a little helmet," in allusion to the comparatively small cup of the flower.

An Udupussellawa planter writing to the Tropical Agriculturist bears testimony to the fact that "of all Australian trees introduced into Ceylon, the tree which has grown beyond all compare is E. microcorys. A specimen eight years old," he says, "was 5 feet 4 inches in girth, and tall in proportion."

The leaves of E. microcorys yield an essential oil, which it is thought may be useful in varnish making.

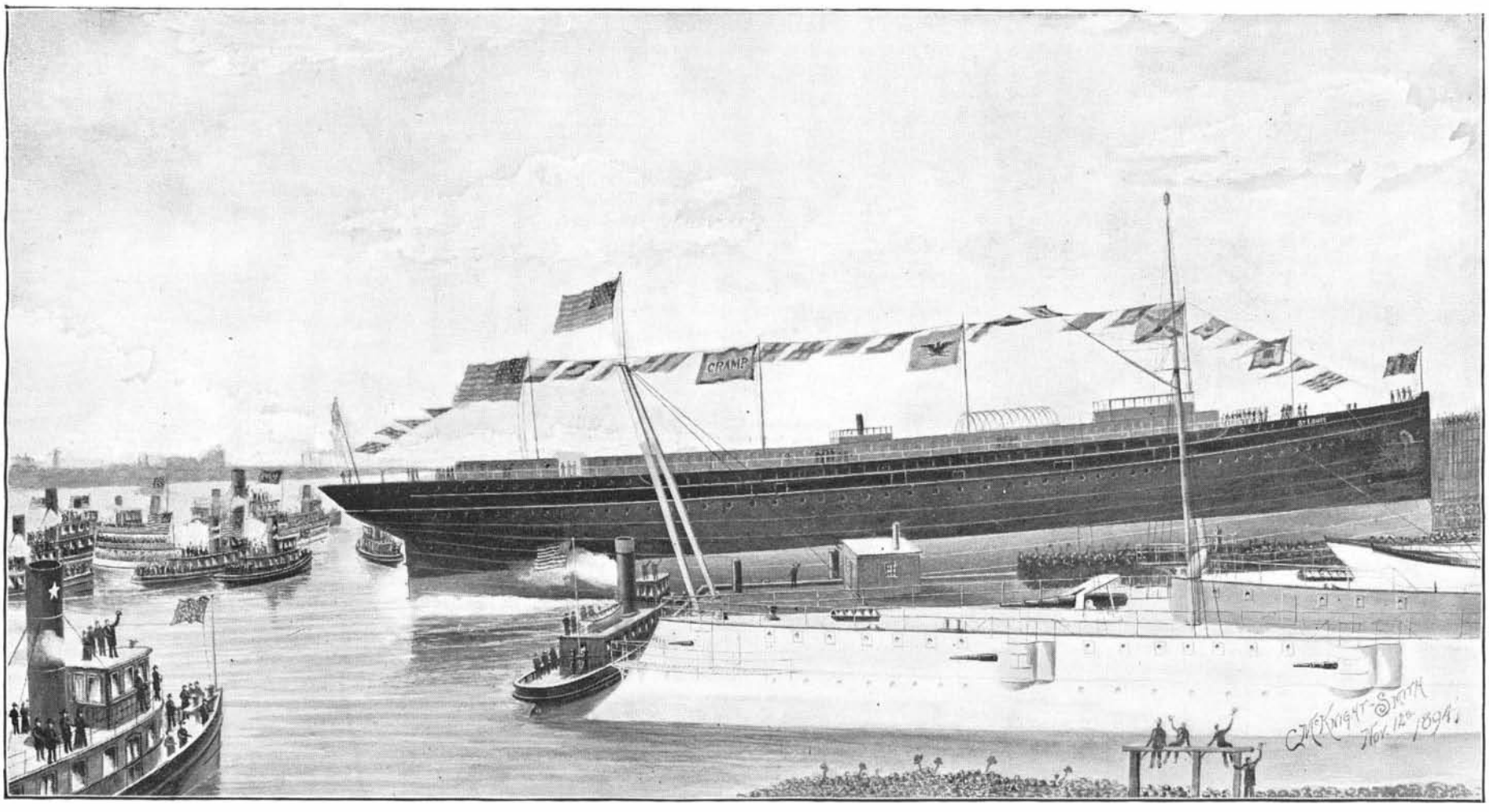
The gum is in many respects similar to the "kino" of Pterocarpus marsupium.

The timber, says Mr. Maiden, the Consulting Botanist to the N. S. Wales government, is one of the most valuable the colony produces; it is strong and durable under and above ground.

He mentions that it would be impossible to enumerate the various uses to which the timber can be put—among others being for naves, felloes, spokes, cop, flooring of buildings, decking bridge work in general, pickets, turned pillars, for mouldings and architraves; in fact, for all building purposes requiring durability.

An ink has been made by steeping chips of tallow wood in water for a day or two (presumably in contact with iron).

Against this timber it may be said that it is liable to attack by white ants, and that it does not hold nails well. On the other hand, the charcoal from tallow wood is thought by some to be one of the best for the smiths, and no timber suffers less by exposure after being cut down.



THE LAUNCH OF THE ST. LOUIS OF THE AMERICAN LINE.

Quick Method for Chilling Test Pieces.

Writing on the use of liquid carbon dioxide for chilling test pieces, especially stone, iron, and steel, at low temperatures, M. Haller says that a cheap and simple form of apparatus in which the test specimens could be cooled would consist of a wooden box with double walls, top and bottom, the spaces between being filled with some non-conducting substance. The liquid gas could be led into such a box from the iron or steel flasks in which it is furnished, and would be deposited in great part in the form of frost at a temperature of about —78 degrees Centigrade. The test specimens could be readily put into and taken from such a box, and would quickly get to a low temperature. One of the Russian railroad companies is on the point of having such an apparatus constructed for testing rails and wheel tires at low temperatures. The possibility of accomplishing the desired object with such an outfit, viz., the rapid freezing of specimens, was demonstrated by putting a number of iron test pieces into a bag of several thicknesses of coarse cloth and then introducing the liquid gas. This at once became solid, and filled all the spaces between the specimens, which thus lay packed in snow. Each specimen was provided with a depression into which mercury could be poured, and on doing this, after a short exposure in the freezing bag, it was found that the mercury immediately soldified, showing, in the absence of a suitable thermometer, that the temperature of the specimens was certainly below —39 degrees Centigrade, if not lower. At the St. Petersburg Laboratory of Experimental Medicine a cold room of quite large proportions has been fitted up in which also liquid carbonic acid is the cooling agent.—Industrie Zeitung.

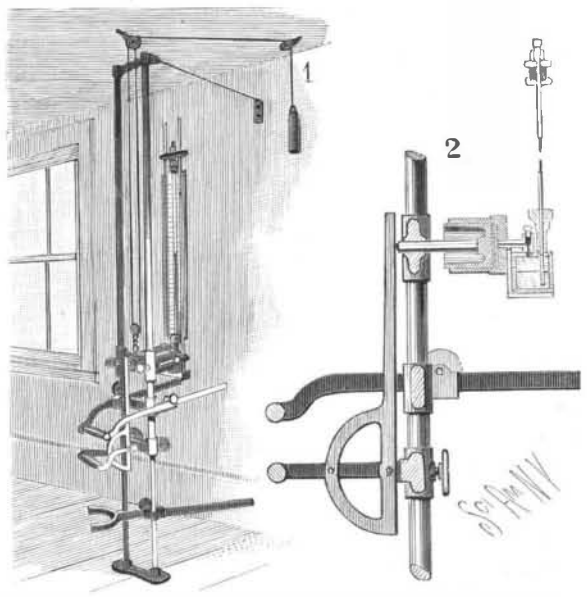
Alumina from Clay.

Suppose a clay of a known strength in alumina. For each mol. of alumina we incorporate with the clay 3 mols. ammonium sulphate and an almost equal weight of neutral potassium sulphate; 1 mol. of potassium sulphate is theoretically sufficient. The whole is well worked up and made into hollow bricks. These bricks are baked at 270°—280°. The ammonium sulphate is then decomposed into acid ammonium sulphate and ammoniacal gas, which may be collected in a condenser. The acid of the acid ammonium sulphate is first thrown upon the neutral potassium sulphate, which becomes acid sulphate. The latter at this temperature, in presence of alumina and clay, is neutralized by the alumina, forming double aluminum and potassium sulphate, i. e., alum. The bricks are then extracted by methodic lixiviation. The silica may be used for cement. The alum is freed from iron by recrystallization, and the solution may be treated for the precipitation of the alumina by means of the ammonia which has been distilled off. To obtain the alumina in a granulated state it is spread out upon stages in a tower traversed from bottom to top by the hot moist ammonia obtained on baking the bricks. The alum is thus transformed into a mixture of ammonium and potassium sulphates and of granular alumina.—Joseph Heibling.

NEW DYNAMOMETER FOR USE IN ANTHROPOMETRY.

The modern method of making progress in any branch of science or mechanics consists in governing future practice by what has been learned by past experience, making every step looking toward advancement only after analysis of what has already been accomplished.

Dr. J. H. Kellogg, of Battle Creek, Mich., has applied this principle to the human body by means of



KELLOGG'S ANTHROPOMETRICAL DYNAMOMETER.

a very simple yet thoroughly practical machine, which he calls the universal dynamometer.

What the indicator and brake are to the steam engine, what the electrical dynamometer and other meters are to the dynamo, Dr. Kellogg's device is to the human body.

It is used for testing the strength of individual groups of muscles; in fact, it can be applied to every important group of muscles in the body, these groups numbering twenty-five for each side. It not only furnishes a basis for the scientific study of muscular dynamics, but it also furnishes a means of testing to secure accurate data on which to base prescriptions for exercise, so as to insure the scientific application of gymnastics to the correction of deviations from the normal standard of symmetry.

This apparatus, as will be seen by reference to the engraving, is simple. It does not show the amount of labor involved in bringing it to perfection. The frame consists of parallel standards secured to base and top pieces and braced. On these standards is placed a rest for the foot or leg, and above this a lever having an arm extending upwardly and bearing on a piston rod projecting from a piston, which acts through the medium of a body of oil and a layer of water on a column of mercury, serving the double purpose of an indicator and a resistance. The mercury column is inclosed by a glass tube and moves in front of a scale. The hydraulic cylinder is adjustable on the parallel rods and is counterbalanced by a weight attached to a cord running over pulleys. An adjustable rest is supported by the rods between the cylinder and the lever.

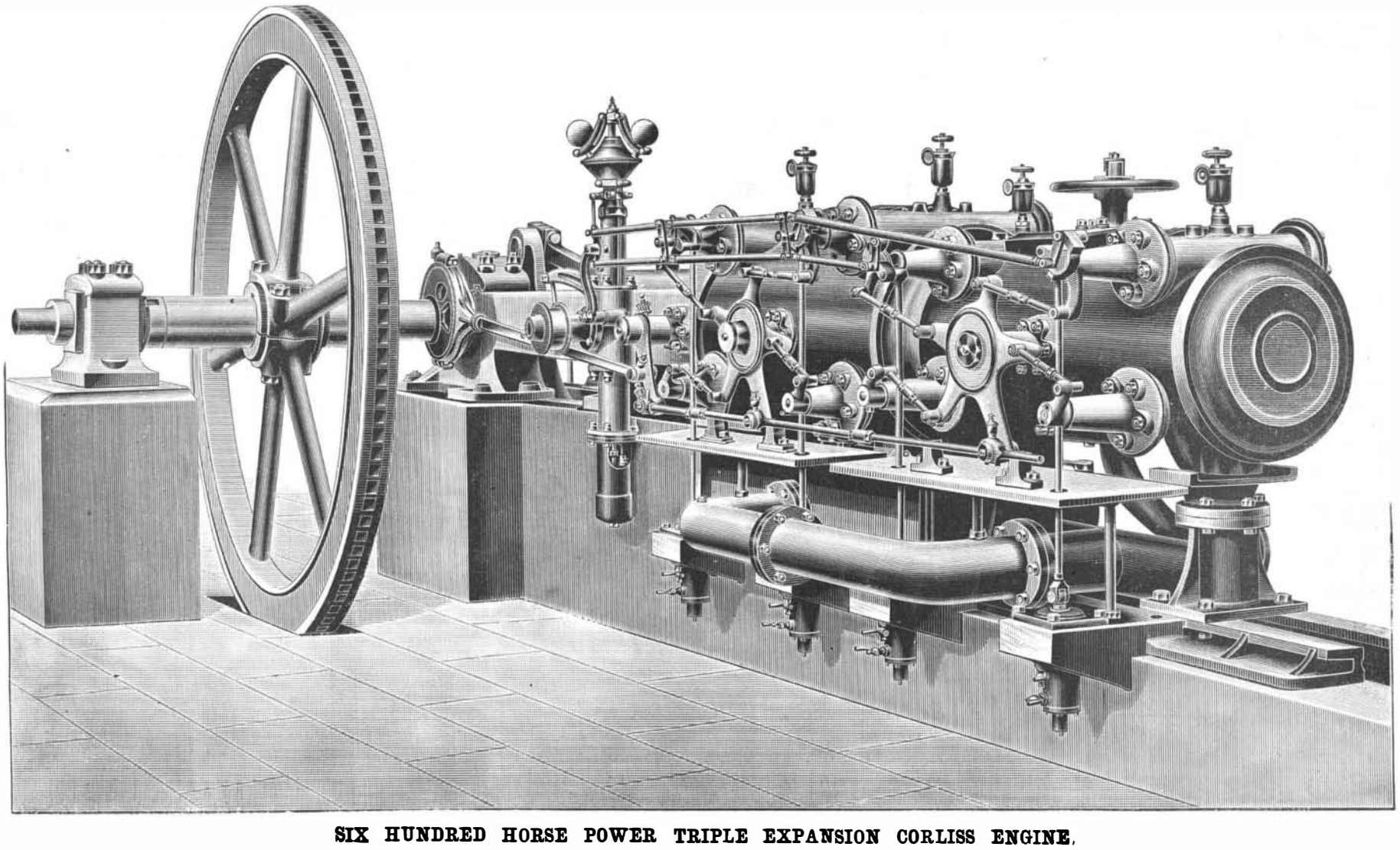
In connection with the dynamometer, Dr. Kellogg's "Percental Charts" are used for making a record of a given case. These charts are based upon the examination of hundreds of healthy men and women of different ages.

This dynamometer has been adopted by the government for testing cadets at West Point, and is in use at Yale University, Wisconsin State University, and in other places where special attention is given to physical culture.

TRIPLE EXPANSION ENGINE—FRIKART'S SYSTEM.

We illustrate herewith, from the Engineer, a triple expansion engine, which has lately been exhibited by Messrs. John Cockerill & Company, at the Antwerp Exhibition. In no country has the rotary valve, which is the main feature of the Corliss system, found more favor than in Belgium. All the large horizontal engines exhibited at Antwerp have valves of the Corliss type, though each manufacturer has a different method for regulating the admision and cut-off, which he considers superior to that adopted by rival makers. In Messrs. Cockerill's engines the system used is called the Frikart. They have for some time made single cylinder engines on this principle, and exhibit one of 100 indicated horse power, with cylinder 1 foot 7¾ inches diameter and 3 feet 5¼ inches stroke. This machine is used to drive a dynamo, and works very steadily under a varying load. The application of the Frikart valve to triple expansion engines is quite new, and the one exhibited at Antwerp is the first that has been made. It works at a pressure of 150 pounds, and its principal dimensions are: Diameter of high pressure cylinder, 1 foot 3¾ inches; intermediate, 1 foot 11⅝ inches; and low pressure, 3 feet 1⅜ inches. The length of stroke is 3 feet 11¼ inches, and the number of revolutions is 80.

The chief characteristic of the Frikart valve is that by it any degree of cut-off from 0 to 75 per cent, or even more if necessary, can be obtained with a single eccentric, as the governor completely controls the admission. It is of the highest importance to be able to prolong the admission, as by this means the power of the machine to deal with extreme cases is greatly augmented. For instance, it may be required to exert increased power; or the pressure in the boiler may fall, either accidentally or because the fires are allowed to burn down before stopping the works. If, as in many machines when the admission of steam extends over more than four-tenths of the stroke, the cut-off only takes place toward the end, this sudden increase



SIX HUNDRED HORSE POWER TRIPLE EXPANSION CORLISS ENGINE.