

TO THOSE AMERICAN CITIZENS WHO DESIRE TO BECOME EXHIBITORS AT THE WORLD'S FAIR, LONDON, IN 1862.

The U. S. Commissioners have nearly completed their arrangements, and the "Special Instruction to American Exhibitors," including extracts from the decisions of her Majesty's Commissioners, will be published in a few days. Meantime, we announce below, the names of those agents or Assistant Commissioners already appointed by the Executive Committee, whose duty it will be to examine and report to the Executive Committee on articles submitted and intended to be exhibited. On their approval, the "Permit of Exhibition," required under the English rules, will be issued at once. Applications to any one of these Assistant Commissioners, named below, must specify,

1. The name, in full, of applicant, and name of firm.
2. Nature of the business carried on by him or them.
3. Address—street, number, town, county. State.
4. Article or contribution offered, name and description (for catalogue), how worked and date of invention.
5. Number of class and section in which to be exhibited.
6. Space required for its exhibition, in square feet, and whether wall, floor or counter space.

Blanks for this purpose are in the hands of those Assistant Commissioners.

American Exhibitors, who choose, can send their contributions by any agent of their own, or any private or other means of conveyance, taking care to be provided with the "Permit of Exhibition," and to mark the packages and invoice them, and consign them, as required by the English rules, quoted in the special circular to be printed in a few days. Those who prefer, may send their contributions to the vessel, free, to be provided by the government for that purpose, which will sail on the 12th of January. Goods intended to go by this vessel must be in New York by the 10th day of that month. None will be received afterward to be sent by the government vessel.

Contributions will be received at the building, in London, up to the 31st day of March, 1862, and with a view to facilitate and to afford the largest opportunity to American citizens for their contributions, the Commissioners here will issue permits of exhibition till the 1st of March, 1862, and none later. No articles, therefore, can be admitted which are not ready on time, so as to allow the report of the agent or Assistant Commissioner to be made and forwarded to Washington by or before that date.

All packages must be directed and labeled as follows (labels in the hands of agents below): "To the Commissioners for the Exhibition of 1862, building in South Kensington, London. Contributions from the United States; forwarded under the sanction of the American Commissioners, by (name of special forwarder), agent at (point of shipment), from (exhibitor's name), of (residence), contents (state name and nature of article within), for class (number of class in which to be exhibited), value (\$), weight of package (lbs.), consigned to (name of agent of exhibitor, or general agent of commission), London."

All other information and circulars can be had by applying to the Executive Committee, at the office of the Commissioners, No. 10 Patent Office Building, Washington, to which address all letters and communications should be sent, or to either of the following-named commissions, assistants or agents, to examine and report on contributions. Articles now ready, examined, approved and permitted, may be sent to the care of Mr. Joseph E. Holmes, No. 61 Canal street, New York, agent here, and will be stored by him free of expense till the United States vessel sails.

The list of Commissioners and Assistant Commissioners appointed to examine, with their places of residence, are as follows:—

- Marshall P. Wilder, Esq., Boston, Mass.
- P. B. Tyler, Esq., Springfield, Mass.
- Frederick Smyth, Esq., Manchester, N. H.
- Charles Whittlesey, Esq., Hartford, Conn.
- T. J. Stead, Esq., (P. M. G.), Providence, R. I.
- Eli Whitney, Esq., Commissioner, New Haven, Conn.
- Joseph E. Holmes, Esq., No. 61 Canal street, N. Y.
- B. P. Johnson, Esq., Commissioner, Albany.

- A. L. Elwyn, M. D., Philadelphia.
- Charles Danforth, Esq., Patterson, N. J.
- Edward Atterbury, Esq., Trenton, N. J.
- James R. Partridge, Esq., Commissioner, Baltimore, Md.
- George H. Knight, Esq., Cincinnati, Ohio.
- J. H. Klippart, Esq., Commissioner, Columbus, Ohio.
- James F. Harney, Esq., Ladoga, Ind.
- J. W. Hoyt, Esq., Madison, Wis.
- Leland Stanford, Esq., Sacramento, Cal.
- W. Duane Wilson, Esq., Des Moines, Iowa.
- H. F. Q. d'Aligny, Esq., Copper Harbor, (L. S.) Mich.

THE ATLANTIC MONTHLY.

It is a common remark that the *Atlantic Monthly* is superior to *Blackwood's Magazine*. Long accustomed to read with very respectful admiration the delightful pages of "Maga," we have been slow to believe that it was surpassed by its youthful rival, but we have at last been brought fully to this belief. We had a strong prejudice against some of the writers, especially Mr. Higginson, which has been thoroughly conquered, and we now regard him as one of the most brilliant magazine writers in the world.

While the *Atlantic Monthly* will compare favorably with *Blackwood* in the learning, the variety, the wit, the vivacity, and the general literary ability which characterize its articles, its superiority is mainly due to the spirit which animates it. *Blackwood* is the advocate of the High Church and Tory party of England, while the *Atlantic* is thoroughly imbued with that large sympathy with universal humanity which generally pervades the higher walks of literature throughout the civilized world. Desiring the continued supremacy of a privileged class, the writers for *Blackwood* look with avowed jealousy and aversion upon the spread of education among the masses, while those of the *Atlantic* enter with temperate but hopeful zeal into the great movement which is raising the vast majority of mankind from the degradation of ignorance, intemperance and superstition, and is carrying our race onward and upward in the path of civilization. This difference in the spirit of the two publications gives great advantages to the American magazine over its Scotch prototype. Though the members of a clique or party may be tickled by adroit cuts at the weak points of the adversary, and though the boldest sophistry may be regarded by them as irrefragable logic, neither the wit nor the reasoning has the same charm for the indifferent public outside. The most powerful and cultivated intellect when employed in advocating the narrow interests of a class, finds itself cribbed and confined in, while a mind engaged in proclaiming the broad principles of universal justice, truth and right, is lifted by its theme to flights apparently above its power.

The *Atlantic Monthly* has done more to raise the standard and to enhance the fame of American literature than any other periodical publication, and we are pleased to see that the December number is not inferior to its predecessors. It is published by Ticknor & Fields, Boston.

THE KIND OF GUNBOATS WANTED.

A correspondent of the *New York Times* on board of the frigate *Roanoke*, states that gunboats of very light draft of water, not large frigates, are the kind of vessels now required to make an effective southern blockade. There are a great number of inland seas in the South, separated from the ocean by narrow necks of land, in which there are many shallow gaps, by which vessels of light draft can pass in and out and carry on an illicit traffic. The two gunboats *Resolute* and *Reliance*, drawing only from six to seven feet, are the very kind adapted for this service, and fifteen of such are needed. Each is 93 feet in length 16 feet in breadth, draft of water 6 feet 5 inches, tonnage 100 tons. Their hulls are very strong; they are heavily coppered, and their sterns are protected by thick boiler iron. They are supplied with vertical direct-acting engines; the cylinders are 17 by 17 inches. The diameter of their propellers is 7 feet 8 inches, pitch 14 feet, and 4 blades. The boilers are return tubular 15 feet in length, by 6 feet ten inches in breadth, high 8 feet. Each boat consumes only about one tun of coal in four hours, and the boilers carry steam at a pressure of 100 pounds, and the en-

gine and boiler do not weigh quite twenty tons. They are stanch and very fleet little gunboats—perfect little bull dogs of war, and are a terror to all the smuggling, sailing schooners on the "secesh" coast of Virginia where they have been cruising.

Regimental Hospitals.

A most intelligent writer on this subject advocates regimental hospitals as being far preferable to general hospitals, because his experience has demonstrated the fact that they are not so liable to be overcrowded, and, at the same time, patients are not so liable to be neglected in them as in very large establishments. A temporary general hospital, near a scene of action, or a place undergoing a siege, has occasionally been found of great service. There was such a hospital establishment near Sebastopol, into which the men who were struck down in the trenches were first carried. It consisted of forty huts, arranged with three broad streets, paved with stone between them, and they were separated about twelve feet from one another. Ditches were dug along the sides of these streets, and the huts were dry, perfectly drained and thoroughly ventilated. By the English army regulations 600 cubic feet of air space has been allowed for each invalid and 800 cubic feet for those who are affected with "granular ophthalmia." This is a disease of the eyes which sometimes breaks out in camps and becomes an epidemic of an alarming character. Plenty of fresh air and fresh food, with the application of nitrate of silver, are the best specifics for it. Cleanliness of clothing, of person, and purity of atmosphere, with fresh food, warmth and pure water are the grand agents at the command of careful surgeons and nurses for the sick and wounded in armies.

The Pontoon Brigade.

The engineering brigade of the army of the Potomac is becoming exceedingly skillful and thoroughly disciplined in the construction of flying bridges with pontoons. Recently, and immediately after the great review of 75,000 troops, this brigade, under the supervision of Col. Alexander, in presence of General McClellan, constructed such a bridge three hundred feet in length in the short space of twenty minutes, and a file of soldiers at double quick time marched over it. It was sufficiently strong for bearing wagons and artillery, and the general and other officers present were highly gratified with the result. We have been informed that thirty-four boats are now being constructed for this brigade; each is to be thirty-one feet in length and two feet and a half deep, with the bottom flat. The width of the boat in the middle is six feet and a half, while the rear end is five feet and the front two feet and a half. The trestle-work consists of pine boards, capable of bearing a wagon or piece of artillery, and sufficiently wide to allow the passage of eighteen men abreast. The trestle boards are to be secured together on the boats, which are to be placed at a convenient distance, so that a continuous bridge is formed extending from 600 to 900 feet. On the outside of the boats are iron rings, by which, when being transported on land, they can be secured to the axles of a four-wheel wagon, the boats serving in place of the body of the vehicle to convey the trestles.

HORSE SHOING IN WINTER.—Some blacksmiths seem to forget that horses shod in the winter should have the inner side of the shoe of such configuration as to let go easily of snow balls formed within the hoof. It only requires a gradual increase in size outward, with no dovetailing in figure, and each ball, almost as fast as formed, will readily be parted with. Why could not the horseshoe, for city use, have a slight coating of gutta percha on its upper side, so as to break the momentum of blows on the paving stones? This would materially ameliorate the difficulty so frequent in cities, where one-fifth of the horses have their feet ruined in a few years by continually treading on too solid pavement.

The carrying capacity of the marine fleet trading between Chicago and Eastern seaports is not far, if any, below 45,000,000 bushels of grain, yet the receipts of produce at that port for the present season have been so immense that this fleet has been unable to carry it off as fast as it accumulated, and at the close of navigation will leave at Chicago over 3,000,000 bushels of grain in store.

Internal Commerce of the Country.

[From the American Railroad Journal.]

One result of the rebellion, the object of which was to secure the commercial independence of the South, has been not only to annihilate its commerce, but to show that it constituted so inconsiderable a proportion of that of the whole country that its loss will soon hardly be missed. Nearly all the products of the South entered into the channels of commerce, so that their value can be readily estimated. For the whole, \$275,000,000 is a liberal estimate, of which cotton may be put down at \$200,000,000. This, by itself, is a vast sum, but relatively to the commerce of the whole country, a very small one, as will be seen by a statement of that of the Northern States.

The State of New York is the only one in which freight on its public works is so classified that accurate estimates can be formed of its value. The following is a statement of the number of tons and value of the same moved on the railroads and canals of the State:—

RAILROADS.			
Kind of Freight.	Tons Carried.	Value per Ton.	Total Value.
Products of the forest...	372,424	\$20	\$7,468,480
Products of animals....	895,519	200	179,103,800
Vegetable food.....	1,103,640	50	55,182,000
Other agricult'l products	143,219	15	2,148,285
Manufactures.....	511,916	250	127,979,000
Merchandise.....	783,811	500	391,905,500
Other articles.....	930,240	10	9,302,440
Totals.....	4,741,773	\$163	\$773,096,500
CANALS.			
Products of the forest...	1,509,977	\$7	\$10,654,710
Products of animals....	19,882	253	5,030,067
Vegetable food.....	1,659,158	30	49,710,838
Other agricult'l products	3,714	29	1,100,069
Manufactures.....	268,759	30	8,113,177
Merchandise.....	250,360	337	84,250,428
Other articles.....	938,364	13	11,989,909
Total.....	4,650,214	\$37	\$170,849,198
Add tonnage of railroads 4,741,773.	163		773,096,500
Total.....	9,391,987	\$100	\$943,945,698

The canal is almost exclusively used for the coarser kinds of freight; the railroad for the more valuable kinds. The value of the freight on railroads is made up from estimates of experienced forwarders; that on the canals from the manifests of shippers.

The number of tons carried on the railroads of Massachusetts for 1860 was 4,094,369, having an aggregate value of \$667,382,147, adopting the value per ton estimated for the railroads of New York. The tonnage of the public works of the two States for the year was 13,486,351, having a value of \$1,611,327,845; a sum eight times greater than the cotton crop, and six times greater than the products of all the cotton States. But the commerce of the public works of the two States by no means embraces the whole that is carried on in them. In New York there is a vast commerce on the Hudson river and the lakes, to say nothing of the immense trade carried on in both over ordinary roads.

The length of the railroads of Massachusetts and New York engaged in the transportation of freight, is 1,317 miles in the former, and 2,569 miles in the latter. The tons carried per mile in the former is 3,108, and in the latter 1,867; the average for the two States is 2,276 tons per mile. There are in the loyal States fully 23,000 miles of railroad in operation. If we estimate the tonnage for the whole to be one-half that of the railroads of Massachusetts and New York, the aggregate tons moved on them is 26,174,000. At a valuation of \$163 per ton the aggregate value of their tonnage is \$4,266,362,000. The tonnage of the canals probably exceeds \$12,000,000, having a value of say \$30 per ton, or \$360,000,000. The total tonnage of the public works of the North, consequently, is 38,174,000 tons, having a value of \$4,626,362,000. The amount of the tonnage is unquestionably largely underrated. We are confident its value is not overstated. In bulk, it is forty-five times greater than the whole cotton crop. In value, twenty-three times greater.

Formidable Expedition down the Mississippi.

Vast numbers of troops and munitions of war, gun boats and floating batteries, are assembled at Cairo, for the intended expedition down the Mississippi.

The gunboats, fifteen in number, are most formidable looking instruments of war. The seven that have been built under contract by Captain Eads look as if they could safely venture upon a tilt or a bat, with Hollins' famous steam ram. The bows and bow bulwarks consist of about three feet of oak timber,

bolted together and sheathed with the best quality of wrought iron plate $2\frac{1}{2}$ inches thick. The sides have the same sheathing, with less bulk of timber. Each boat is pierced for thirteen guns, four on each side, three in the stern, and two at the bows. The bow guns are 81-pounder rifled cannon; the others are 8-inch columbiads. The sides of the boats both above and below the knee, incline at an angle of 45° and nothing but a plunging shot from a high bluff could strike the surface at right angles. The boilers and machinery are so situated as to be perfectly protected, and may be considered quite out of danger. The iron plating has been severely tested by shots from rifled cannon at different distances, and has shown itself to be utterly impervious to any shots that have been sent against it, even at a range of 300 yards.

Take them altogether, the boats are about as formidable looking instruments of destruction as ever navigated American waters, and if such a wise combination of oak, iron and saltpeter, will not bring the persimmons, we will call them sour, and let Commodore Hollins pull them down and eat them at his leisure. These fifteen gunboats, with their 200 columbiads and rifled cannon, are but a fraction of the warlike fleet destined to swarm down the Mississippi. There are thirty-eight floating batteries of a 64 columbiad each, and twenty-eight river steamboats.

The military part of the movement, it is supposed, will be under the command of Major-General Halleck, who is now organizing his forces in St. Louis, and he will be joined by General Grant's column at Cairo, and the column of General Smith from Paducah. The expedition will probably be from 80,000 to 100,000 strong, a force that ought to be able, properly followed up, to open the Mississippi to its mouth.

The Sentiments of our Cotemporaries.

To find room for all the flattering notices which this paper receives at the hand of its cotemporaries would occupy too much of the space of these columns, but we desire occasionally to insert a flattering notice, to show how kindly our editorial brethren treat us, and how highly they value our labors. The following is from the *Standard*, published at St. Andrews, New Brunswick:—

The SCIENTIFIC AMERICAN, which we have had occasion to notice at various times, is one of the cheapest, as well as most reliable, sources of information to the mechanic, millwright, and, we add, agriculturist, on this continent; it is conducted with marked ability and tact, its conductors are men of scientific attainments, and have the faculty of conveying information in an attractive form and in a concise and perspicuous manner; in addition to which they give notices of the most important inventions, which are frequently accompanied with engravings. The paper is printed in a convenient form for binding, contains 16 pages each week, with a number of beautifully executed illustrations—making a yearly volume of 832 pages, at the low price of \$2 per annum. Each number contains a complete list of the claims of all the patents issued each week at the U. S. Patent Office, and a column devoted to the metal and lumber markets. We trust our artisans will subscribe for this standard work, one number of which is of more value to them than all the trashy "story papers" published. Ten copies 12 months will be furnished for \$15.

The above being from a British journal the editor refrains from alluding to the war department of our paper lest, we suppose, he might not seem to be in that neutral vein in which all English subjects are so desirous to remain concerning our unhappy war. The *Andover (Mass.) Advertiser*, however, says the following in relation to the war feature of the SCIENTIFIC AMERICAN:—

Every one is naturally desirous of obtaining the earliest and most reliable information respecting the events of the war and the means used by the respective combatants for its prosecution. It is a civil war; both parties were lately one; and the implements of carnage are equally well known in both sections, particularly to the officers who were so lately in the government service. The inventive genius of the people is now stimulated to the highest pitch by the demand of patriotism, as well as the hope of reward. The mechanical talent of the North is constantly developing new implements and fresh improvements, which will naturally assist their cause. With all these improvements we shall need to keep up our acquaintance. For some time past the SCIENTIFIC AMERICAN has given a very clear, reliable and full account of the progress of events. It devotes special attention to new inventions, and furnishes engravings of most of them, with such descriptions as enable one to understand the machine illustrated almost as well as, and in some instance better than, if the machine were before you. This paper is devoted to the interests of mechanical inventions and industrial pursuits generally, and stands at the head of its class.

The salt works now in operation in Michigan, number nine, using six hundred kettles, and yielding a product of five hundred and fifty barrels daily.

RECENT AMERICAN INVENTIONS.

Reaping Machine.—This invention relates, first, to an improved raking device so constructed and arranged as to admit of being adjusted to suit the height or length of the grain and operate perfectly at all times. To insure this result it is necessary that the rake or shoe strike the cut grain about midway the length of the latter, and be properly guided and sustained at all points of its movement, and all retrograde movement avoided; and also that the cut grain be raked from the platform in gavels of uniform size. Second, it relates to a novel arrangement of the gearing or sickle and rake-driving mechanism, and the relation of the same with the draft pole, whereby side draft is principally counteracted, as well as the downward tendency of the sickle during its cutting operation. And third, this invention relates to an improved manner of connecting the reel with its supports, whereby the reel may be adjusted relatively with the sickle or cutting device as desired, and also to an improved arrangement of a divider at the grain end of the platform, whereby the divider is made to perform the double function of a divider and reel support. It was patented by John Tustin, of Petaluma, Cal.

Steam Boiler.—Mr. Silas Stuart, of Sterling Center, Mass., has invented an improved boiler which he claims may be constructed in an economical manner for the purpose of generating steam or heating water with a very moderate consumption of fuel. To this end the boiler and fire chamber are constructed and arranged in such a way that the water will be exposed to a large heating surface, and with a fire chamber of very moderate dimensions, the latter being of annular form in its horizontal section, and interposed between two concentric water chambers, which comprise the boiler, the antechamber being encompassed by a flue from the fire chamber. The invention has also for its object an improvement in the grate of the fire chamber, whereby admission of air into the fire chamber may be graduated with great nicety and the ashes from the fire chamber readily discharged when necessary.

Car Truck.—This invention, patented by M. La Rue Harrison, of Burlington, Iowa, consists in a certain mode of suspending the bolster from the springs by means of swinging stirrups, whereby the weight of the car may be transmitted to the trucks at points near the bottom or below the springs instead of above them, and the car, in case of any lateral movement, is caused to swing like a natural pendulum, instead of rocking like an inverted pendulum. An illustration of this invention appeared in our last number.

Improved Locomotive.—This invention consists in the employment, in a locomotive, of wheels applied to bear against opposite sides of a rail, such wheels on one or both sides being the drivers, in combination with supporting wheels, rolling on the top of the same rail, making a light and cheap engine adapted to a cheaply-constructed permanent way, which makes it specially applicable to the purpose of canal towing. It also consists in the employment of a portion of the weight of the locomotive acting through the intervention of levers or their equivalents, to press such driving wheels toward the side or sides of the rail. The inventor is John L. Whetstone, of Cincinnati, Ohio.

Variable Cam.—This invention relates to cams for producing movements in a direction parallel, or nearly so, with their axes of rotation. It consists in a peculiar construction of such a cam whereby its throw can be varied at pleasure, and it may be made to operate in all conditions, without any percussive action, and consequently without noise. Patented by the inventor, W. H. Andrews, of New Haven, Conn.

Aerial Ship.—This invention consists in the use of oscillating wings of improved construction attached to the sides of a boat-like car, causing it to ascend, maintaining it at a given elevation, or regulating its descent through the air, as may be desired. Also in a certain arrangement, in combination with such wings, of a screw propeller, for giving the car a movement in a horizontal direction, and of spiral-bladed wheels, like screw propellers, for assisting the side wings in producing the ascent, maintaining the elevation or regulating the descent of the car. The inventor of this machine is W. F. Quimby, of Stanton, Delaware.