Labor and Wealth in the United States.

Henry Ward Beecher says: One of the greatest causes of thanksgiving is that labor whistles and sings in our territories. Elsewhere it is mourning its own death. The prodigious facilities for acquiring wealth in America are just beginning to be perceived. The wealth is here, easy to be developed, concentrated, and administered. The being "worth a million" won't make a man eligible to the class of rich men much longer. Some think wealth dangerous. Wealth is power, and that is always dangerous, but no nation ever rose from a barbarous state without it. Missionary preaching is of no use if it does not show the heathen how to make money. No poor man can be much in a poor community, although among nabobs his intellect may compensate for lack of worldly goods. But riches must be somewhere. The dangers of wealth here are less than we fear. Organized wealth oppresses the community, but will yet prove itself a benefactor. It tends to despotism because of its nascent state. It is not necessary that the wealth which owns the market should also own civility, or should control courts and legislatures. But we must consider the hygienic qualities of wealth. It is the almoner of employment, of comfort, of enjoyment. Money is vivifying industry to the very bottom of the community. Riches are the poor man's providence, and on the whole, are in subordination to intelligence and domestic virtue. How to use money is an art. Many can make money, who haven't the slightest idea of spending it correctly, while many more can spend that don't know how to make; but, as a general thing, money earned wisely is expended discreetly. Men live here in better constructed houses—which require more ingenuity to keep constructed—than anywhere else. The money-producing force of America is more than double the average money-producing force of any other nation. There are 25,000 land-owners in Great Britain. Here land is so cheap that scarcely an inhabitant but owns his plot, whether little or big. I know farmers I should hate to meet in argument unless I were on their side, while many hammer away at the anvil all day and read scientific and historical works all the evening. Men who deride money are almost invariably minus the article themselves, and, if they will only consider, will find that the universal diffusion of wealth is one of America's greatest blessings. Get rich! Pay anything for it but yourself, your honor, love, sympathy, faith in man, and faith in God. Wealth here is public spirit. Architecture is its adopted child. Cornell, Vassar, Cooper, and hundreds of others, are significant American names, and the time approaches when wealth shall be symbolic of every public improvement. Wealth has its evils and temptations, but to-day is something for which we, as a nation, may thank God, and pray that the time may not be far removed when the streets of gold spoken of in Scripture may be here on earth.

Progress in Japan.

"Great Japan, ruled by our wise Emperors, is superior to all other countries in the world." So says the Japanese patriot and philosopher, Kato Lukeichi; and certainly the most recent accounts we have of the proceedings of these orientals, places them in strong contrast with the "Western barbarians." In Japan, bridges are being built; in France, they are being blown up. In Japanese waters, numerous fixed and floating lights and buoys are being provided for the guidance of the navigation; in the Baltic, they are being removed and taken up. In the one quarter of the world the desire is that the safety of the ships may be secured; in the other, that they may be destroyed. The municipal council of Osaka is carrying out an efficient system of paving and drainage; is macadamizing their suburban roads, and adorning the city by planting 500 or 600 trees. On the other hand, the drainage of the Western continent is blocked and corrupted by the corpses of men and the carcasses of horses, and Paris, the fairest city of the West, is being made a great pest and charnel house, and the vernal beauties of the environs have been stamped out, and they have been changed into a hideous wilderness. The princes of Japan are fitting up improved machinery at their coal mines, and building cotton mills; the princes of Prussia are "assisting" in the destruction of grand and venerable cathedrals, splendid libraries, and the most beautiful works of nature and art, and are making "requisitions" for bread and wine to a ruined and starving population. The disastrous doings of the Westerns in prosecuting the art of war we know of but too well, from the harrowing details with which our daily papers are filled; of the more humane and creditable performances of the orientals, in prosecuting the arts of peace, we are informed by her Majesty's consuls at the Japanese ports open to foreign commerce. These reports have been published quite recently. The foreign trade done at these ports—Karrawaga, Hiogo, and Osaka, Nagasaki, Haokdati, and Niigata—may, according to Sir Henry Parkes, be taken at ten millions sterling, of which above half is in British hands. It gave employment, in 1869, to 1,043,405 tuns of foreign shipping, 398,264 tuns of which were British. The returns of shipping are exclusive of native junks and river boats. At some of the ports, the large proportion of the trade conducted by British ships is very remarkable, the proportion being greater than that done by the foreign vessels of all other nations together. The foreign commerce of Japan, considering area and population, is growing, it appears, more rapidly and satisfactorily than even that of China. The total imports, in 1869, were of the value of 17,356,932 dols., and the exports 11,475,645 dols.

The Hartford Steam Boiler Inspection and Insurance Company.

The Hartford Steam Boiler Inspection and Insurance Company makes the following report of its inspections for October, 1870:

During the month 522 visits of inspection were made and 920 boilers examined—702 externally and 234 internally, while 136 were tested by hydraulic pressure. Number of defects in all discovered, 418—number of dangerous defects, 44, which in detail are as follows:

Furnaces out of shape, 12—1 dangerous; fractures in all, 13—5 dangerous; burned plates, 22—2 dangerous; blistered plates, 51—8 dangerous; cases of sediment and deposit, 72—5 dangerous; cases of incrustation and scale, 50—4 dangerous; cases of external corrosion, 22—4 dangerous; cases of internal corrosion, 15—1 dangerous; cases of internal grooving, 5; water gages out of order, 4—2 dangerous; safety valves overloaded 20—2 dangerous; pressure gages out of order, 74, varying from −10 to +20; boilers without gages, 2—1 dangerous; cases of deficiency of water, 8—2 dangerous; broken braces and stays, 12; boilers condemned, 6—6 dangerous. Two cases have been found where there were stopcocks between the safety valve and boiler. They were both removed before the boilers could be accepted by this Company. Several mud drums have been found in bad condition. These drums are usually bricked in, and cannot be thoroughly examined unless the brick work is removed. They corrode rapidly, and should be examined at least once a year.

As will be seen there have been 11 explosions during the month, by which 9 persons were killed, and many wounded. Several of these explosions were of new boilers. Many people think that when they have put new boilers in their works, they are perfectly safe. Such, however, seems not to be the fact. One of the most terrific explosions which has occurred within the year, was of a new boiler. From subsequent examination, a fracture was discovered in one of the flues, which was regarded as the cause of the accident. From unequal expansion and contraction, resulting from urging the fires injudiciously, the fracture came, and so far as could be ascertained, the flue collapsed, and an explosion followed. The six boilers condemned have been replaced by new ones.

PERPETUAL MOTION.

NUMBER III.

The two self-movers, which it has been claimed were really such, were the inventions of the Marquis of Worcester, author of the "Century of Inventions," and Jean Ernest Elie-Bessler Orffyre, or Orphyrreus, who is usually named Orffyreus in English and German works. The latter was born in 1680, near Zittau, in the department of Alsace, France, and early studied theology and medicine, but his erratic genius was only to be satisfied by engaging himself in the pursuit of a variety of the mechanical arts and painting. He asserts that it was during his search for whatever might prove curious and valuable that he discovered perpetual motion, and between the years 1712 and 1719, made two machines on his system; one he desired to exhibit publicly, but broke it up rather than submit to the payment of the license or tax required by the Government of Cassel; the other he destroyed after its having been unfavorably reported on by M.'S Gravesande. He published, in German and Latin, a book or pamphlet entitled "*Le Mouvement Perpétuel Triomphant*," quarto, dated Cassel, 1719. Other accounts differ respecting the breaking of the second machine; and, on insufficient authority, Mr. Partington styles him a "German mechanic." Dr. William Kenrick, among his miscellaneous works, wrote "An Account of the Automaton, or Perpetual Motion of Orffyreus, with additional remarks," in editions dated 1770 and 1771. Orffyreus died in November, 1745.

The following is a description of the Marquis of Worcester's wheel, described in the 56th article of the "Century of Inventions," as "An Advantageous Change of Centers."

"To prouide and make that all y^e^ weights of y^e^ defcending syde of a wheele shal be perpetually further from y^e^ center, then thofe of y^e^ mounting syde, and yett equal in number and heft of ye one syde as y^e^ other. A most incredible thing if not seene, butt tryed before y^e^ late King of happy and glorious memorye in y^e^ Tower by my directions, two Extraordinary Embaffadors accompanying his Ma^tie^ and y^e^ D. of Richmond, D. Hamilton, and most part of y^e^ Court attending him. The wheele was 14 foote ouer, and 40 weights of 50 p^d^ apiece; S Wm. Belford, then Lieu^t^ of y^e^ Tower, and yet liuing can justify it with seuer ll others; they all saw that noe sooner these great weights passed y^e^ Diameter Line of y^e^ vpper syde but they hung a foote further from y^e^ center, nor no sooner passed the Diameter line of the lower syde, butt they hung a foote nearer; bee pleased to judge y^e^ consequence."

Of the inventions of these two men Dircks says:

"The only appeal that can be made in apology for the pursuit of perpetual motion, is derivable from the results represented to have been obtained by the Marquis of Worcester in one instance, and by Orffyreus in another. All the circumstances relating to their singular inventions excite our curiosity, raise our skepticism, and induce us to pause in our decision. Let us first consider the inventors personally; and, secondly, their inventions and the circumstances attending their exhibition. The two men were of very different character and position in life. The first noble by birth, of ancient lineage, loyal to the extent of sacrificing his property in support of the cause of Charles I., and evidencing by his prayers, his truly religious sentiments. About or before 1648 (as the King died 1649), he exhibited his wheel, or perpetual motion, in the Tower, before his Majesty, two extraordinary Ambassadors, the Duke of Richmond, Duke Hamilton, most part of the Court, and Sir William Belford, Lord Lieutenant of the Tower. We have to consider the upright character of the Marquis, his having invented the steam engine, his worthiness in all respects, and the circumstances here detailed, and then ask ourselves: Little as Science favors any belief in such an invention, can we see any reasonable grounds for error in this great experiment, or believe that a person so distinguished, and so much to be admired in all other respects, could thus boldly and recklessly deceive himself, his noble company, and the public taking ten years or upwards to elaborate and record a gross falsehood? It seems incredible, and true respect for the Marquis' memory will go far to maintain doubts respecting the infallibility of all mathematical demonstrations adverse to the possibility of a self-motive power. Secondly:

"Orffyreus was of humble origin, had versatile talents, and fickle, discontented, unsettled, irregular, and eccentric. He was ambitious, boasting, and the very man to raise up enemies. Between 1712 and 1718 he made and destroyed in succession four wheels or machines. He had learnt the art of clock-making, and several mechanical arts, and is supposed to have constructed or put these wheels together himself. He had a princely patron, who wished to obtain practical results from the invention for manufacturing and other operations. A misunderstanding ensues; and from that time to his death, in 1745—at least twenty-eight years—the subject lies dormant, and the invention dies with him. This last fact, coupled with the wheel having raised so great a weight as 70 lbs., makes a doubtful case still more doubtful; and particularly when, about the same time, Geiser imposed on the German public with a mere piece of clockwork, as a true perpetual motion.

"The Marquis of Worcester's wheel was fourteen feet in diameter; it was rotated by the action of forty 50-lb. weights —2,000 lbs.—an enormous weight, requiring some very laborious operations of the carpenter to erect a sufficiently strong framework. Its completion must have taken some time, and led to frequent visits from the noble inventor, as well as experiments to test its correct working, before offering a practical demonstration before majesty.

"Orffyreus' fourth or last wheel, at Hesse Cassel, was twelve feet in diameter, fourteen inches broad, made of light oak framing, and covered with oil cloth. It would revolve either way, and this alone casts a shade of doubt on there being any deception in practice with it. But, strange to say, it had power enough to raise 70 lbs. to a considerable hight. Its operations were seen and attested by so many, that these broad facts rest not alone on the inventor's authority. It was so ingeniously made, that M. Gravesande wrote to Sir Isaac Newton on the subject; and his letter and mathematical reasonings, in reference to the matter, appear in his works, edited by Professor Lalande, 1774."

The following is the letter written by Professor 'S. Gravesande to Sir Isaac Newton, in regard to the wheel of Orffyreus.

SIR,—Doctor Desaguliers has doubtless shown you the letter that Baron Fischer wrote to him some time ago, about the wheel of Orfyreus, which the inventor affirms to be a perpetual motion. The landgrave, who is a lover of the sciences and fine arts, and neglects no opportunity to encourage the several discoveries and improvements that are presented him, was desirous of having this machine made known to the world, for the sake of public utility. To this end he engaged me to examine it; wishing that, if it should be found to answer the pretensions of the inventor, it might be made known to persons of greater abilities, who might deduce from it those services which are naturally to be expected from so singular an invention. You will not be displeased, I presume, with a circumstantial account of this examination; I transmit you, therefore, a detail of the most particular circumstances observable on an exterior view of a machine, concerning which the sentiments of most people are greatly divided, while almost all the mathematicians are against it. The majority maintain the impossibility of a perpetual motion, and hence it is that so little attention hath been paid to Orfyreus and his invention.

For my part, however, though I confess my abilities inferior to those of many who have given their demonstrations of this impossibility; yet I will communicate to you the real sentiments with which I entered on the examination of this machine. It is now more than seven years since I conceived I discovered the paralogism of those demonstrations, in that, though true in themselves, they were not applicable to all possible machines, and have ever since remained perfectly persuaded, it might be demonstrated that a perpetual motion involved no contradiction; it appearing to me that Leibnitz was wrong in laying down the impossibility of the perpetual motion as an axiom. Notwithstanding this persuasion, however, I was far from believing Orfyreus capable of making such a discovery, looking upon it as an invention not to be made (if ever) till after many other previous discoveries. But since I have examined the machine, it is impossible for me to express my surprise.

The inventor has a turn for mechanics, but is far from being a profound mathematician, and yet his machine hath something in it prodigiously astonishing, even though it should be an imposition. The following is a description of the external parts of the machine, the inside of which the inventor will not permit to be seen, lest any one should rob him of his secret. It is a hollow wheel, or kind of drum, about fourteen inches thick and twelve feet diameter; being very light, as it consists of several cross pieces of wood framed together; the whole of which is covered over with canvas to prevent the inside from being seen. Through the center of this wheel or drum runs an axis of about six inches diameter, terminated at both ends by iron axes of about three quarters of an inch diameter upon which the machine turns. I have examined these axes, and am firmly persuaded that nothing from without the wheel in the least contributes to its motion. When I turned it but gently, it always stood still as soon as I took away my hand; but when I gave it any tolerable degree of velocity, I was always obliged to stop it again by force; for when I let it go, it acquired in two or three turns its greatest velocity, after which it revolved for twenty-five or twenty-six times in a minute. This motion it preserved some time ago for two months, in an apartment of the castle, the doors and windows of which were locked and sealed, so that there was no possibility of fraud. At the expiration of that term indeed his serene highness ordered the apartment to be opened, and the machine to be stopped, lest, as it was only a model, the parts might suffer by so much agitation. The landgrave being himself present on my examination of this machine, I took the liberty to ask him, as he had seen the inside of it, whether, after being in motion for a certain time, no alteration was made in the component parts; or whether none of those parts might be suspected of concealing some fraud; on which his serene highness assured me to the contrary, and that the machine was very simple.

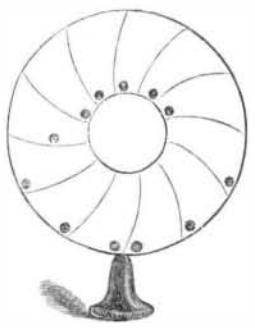
You see, Sir, I have not had any absolute demonstration,

that the principle of motion which is certainly within the wheel, is really a principle of perpetual motion; but at the same time it cannot be denied that I have received very good reasons to think so, which is a strong presumption in favor of the inventor. The landgrave hath made Orfyreus a very handsome present, to be let into the secret of the machine, under an engagement, nevertheless, not to discover, or to make any use of it, before the inventor may procure a sufficient reward for making his discovery public.

I am very sensible, Sir, that it is in England only the arts and sciences are so generally cultivated as to afford any prospect of the inventor's acquiring a reward adequate to this discovery. He requires nothing more than the assurance of having it paid him in case his machine is found to be really a perpetual motion; and as he desires nothing more than this assurance till the construction of the machine be displayed and fairly examined, it cannot be expected he should submit to such examination before such assurance be given him. Now, Sir, as it would conduce to public utility, as well as to the advancement of science, to discover the reality or the fraud of this invention, I conceive the relation of the above circumstances could not fail of being acceptable.

Partington, in his "Manual of Natural Philosophy," endeavors to interpret the somewhat enigmatical specification of the Marquis of Worcester by the following diagram, which it is self-evident almost at a glance can have no movement except that derived from external forces.

Fig. 5.



Making a long jump from the remote to the near, we shall next present an illustration of a perpetual motion machine, invented by Horace Wickham, Jr., of Chicago, Ill., and on which a patent was obtained July 26, 1870. Mr. Wickham will thank us for placing him in such honorable company as the Marquis of Worcester, and our readers will perhaps be glad to see the form and essence of a machine, which Western journals have greatly lauded as most wonderfully ingenious, etc., though if they can see how it generates any motive power, their mental vision will be superior to ours.

A is the bed or table upon which the standards for supporting different parts of the machine are secured. B B are the standards for supporting rocking beam, C. This rocking beam is pivoted at the center to the standards by the ring, D, and set screws. These centers have points like lathe centers. The other parts of the machine consist of a governor, fly wheel, etc.

C is the rocking beam, constructed in two parts and secured together by the bands, E. The rocking beam consists of two tubes; the upper one is made straight, and the lower one in the form of a W. These tubes are connected together at their ends in such a manner as to allow the ball used to pass from the lower tube to the upper one, by means of hinged inclined run-ways, F, and valve, G, and from the upper one to the lower, inside of the band, E", by the opening therein. The inclined run-way, C, is hinged at one end to the upper tube, F', at the bottom of its opening or exit, inside of the band, E', while the other end rests on the valve, C'.

This valve has attached on its under side, a pin which projects down through a hole in the band, E, a sufficient distance, so that, when the pin strikes the standard, H, secured to the bed or table, as the rocking beam oscillates it will raise the valve a short distance above the upper tube. The valve is made to incline toward the opening in the upper tube, so that the ball, when raised on the valve, will roll into the same, by means of the hinged inclined run-way, F. I is a ball, which runs in the upper and lower tubes; this ball is charged with a necessary amount of quicksilver, for giving more weight to the same, and also for giving a much quicker momentum to the ball. This ball is to be used in the rocking beam for the purpose of unbalancing, and also to exert the pressure of its specific gravity on the same at whatever point or position it may be in, and in so doing it assists in oscillating it.

The pitman, J, connects the crank shaft with the oscillating beam. The rocking beam is provided, on the opposite end to which the pitman is attached, with a rod, on which is placed an adjustable weight, which is secured at any desired point by means of a set screw. This weight is for the purpose of counterbalancing the adjustable band provided with a rod to which the pitman is attached, and also the pitman.

The governor is for the purpose of regulating the motion of the machine, and is operated through the medium of a gear wheel on the crank shaft, and other suitable gearing. The governor is constructed in the usual manner, excepting in using the cut-off valve, as in steam engines, which is dispensed with, and an automatic break is used and operated by means of the rise and fall of the governor balls. The automatic break consists of an elastic band, one end of which passes up through a hole in the guide rod projecting from the standard that supports the governor, and is connected to an arm projecting toward and partly around the upright shaft of the governor.

The tension of the band is regulated by nuts and screw-thread on the end of the band. The other end of the band passes under a wheel on the shaft, K, and is secured to a projecting arm on the standard that supports the governor. The crank shaft is counterbalanced.

I do not wish to confine myself to the precise construction of the rocking beam, as shown and described, as I intend using, in lieu thereof, wires, or rods, arranged in the form and shape of the rocking beam described, with mounted weights arranged to roll on them, which, in connection with the other parts of the machine, will accomplish the same result.

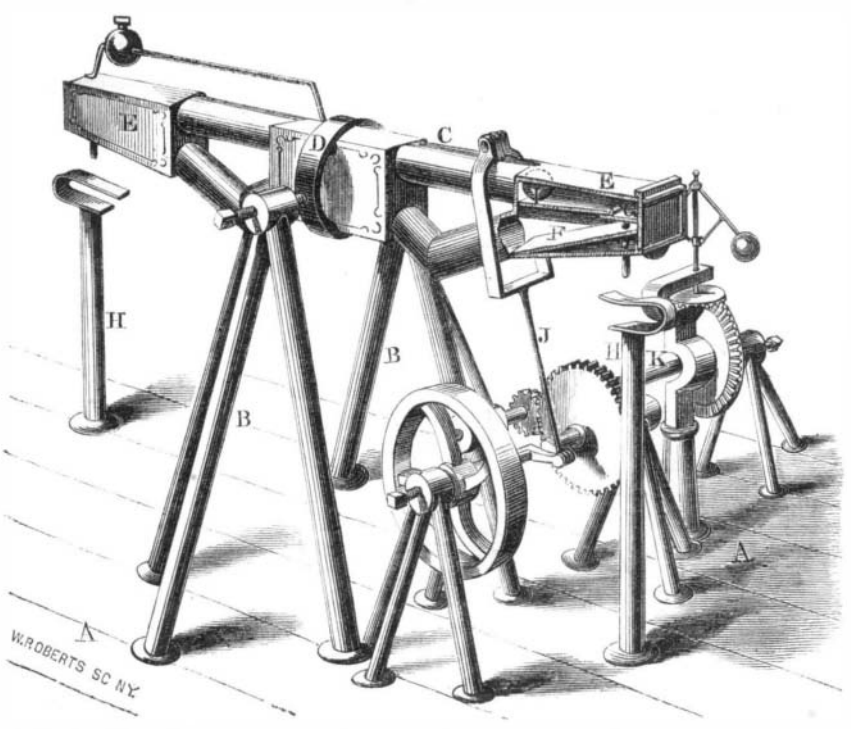
The lower tube can be made semicircular in form and shape instead of the form and shape of a W. Any number of rocking beams may be used, and more than one ball can be used in the rocking beam, by having inclined run-ways and valves on each end of said beam; the rocking beam so arranged that the balls drop from one tube to the other at the center of the of the beam, and rolling alternately from the center to the ends of the beam.

The rocking beam is oscillated by any power operating alternately on each end of the same, and which transmits motion to the other parts of the machine through the medium of the pitman and crank shaft, and for applying power to any other machine a pitman is secured on the opposite side of the rocking beam to which the pitman, J, is attached, or, instead thereof, pulleys, and endless belts on the shaft, K, or the crank shaft.

The spokes of the fly wheel are charged with quicksilver, for the purpose of giving weight to the same at any desired point, as it passes from the center to the circumference of the wheel.

It is claimed that this machine has run seven months without stopping, independent of any external force, which we do not believe, and we think our readers, after reading the above description of it, abstracted from the specification on file in the Patent Office, will concur with us in our belief.

Fig. 6.

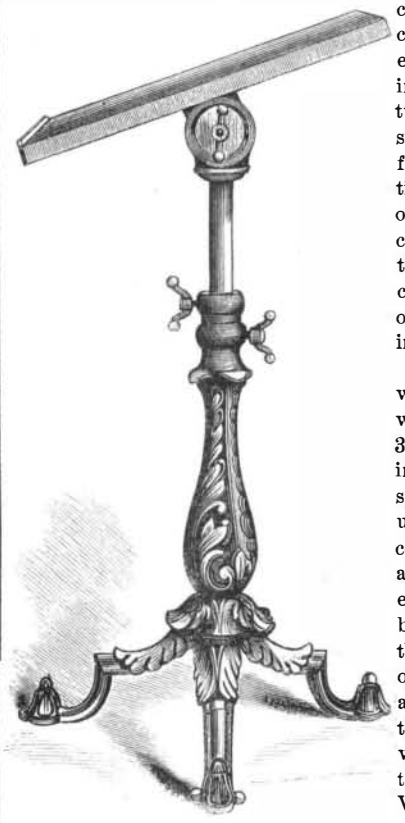


Wire Rope Bridges.

At a recent meeting of the Institution of Mechanical Engineers, held at Birmingham, a paper was read entitled "Description of a Wire-Rope Bridge, at Landore Steel Works, for conveying Materials across a Navigable Stream," by Mr. William Hackney, of Swansea, England. This bridge has been erected as an inexpensive means of removing the spoil from excavations made in carrying out an extension of the Landore Siemens Steel Works, near Swansea, and depositing it on the low marshy ground at the other side of a navigable stream, which runs by the side of the works; and it was a necessary condition that any structure thrown across the stream should be arranged so as not to interfere with the passage of vessels. The bridge is constructed of a pair of steel wire ropes, stretched alongside each other across the stream, and sloping downwards from the higher bank on which the works are situated, to the lower ground on the opposite side, where the spoil is deposited. On each rope travels a runner, or small carriage mounted on a pair of grooved wheels, from which the trucks are suspended by chains; and the two runners are connected together by an endless wire cord passing round a pulley on each bank, so that the loaded truck running down from the higher bank on one of the ropes draws up an empty truck from the lower bank on the other rope, the inclination of the ropes being sufficient for this purpose; the speed is regulated, if necessary, by a brake upon the cord pulley. The ropes are strained over abutments on either bank, and attached by chains to anchorages in the ground; and in order to admit of the passage of vessels in the stream, the abutment on the upper bank is constructed of a timber framing mounted on wheels, which can be run forwards through a sufficient distance to allow of the wire ropes being lowered to the bottom of the bed of the stream, so that the whole bridge is then completely out of the way of passing vessels. For raising the bridge again, the movable abutment is drawn backwards by a hand-winch, until the ropes are hauled up nearly tight; the hauling chains are then hooked to the anchorages by screw couplings, by which the ropes are finally tightened up, and the hand-winch is thus relieved from all strain during the working of the bridge. In this way the bridge is raised into its working position in the course of a few minutes by a couple of men at the upper end. Owing to the curve in which the wire ropes hang, their inclination is steepest close to the upper bank, thus retarding the speed of both trucks as they approach the landings on either bank, and serving generally to stop them without the use of the brake. This bridge has now been in constant use for several months, and has proved very satisfactory for the special purpose for which it was designed.

Adjustable Stand for Draftsmen.

We herewith illustrate a stand which meets a want long felt by draftsmen and artisans. It consists of a table which can be readily and conveniently adjusted to any hight and inclination, easily turned to bring either side of the work in front, and, at the same time, be substantial, ornamental, and cheap: It is made entirely of iron, except the top, which is of wood, 20 by 22 inches.



The stand complete weighs 55 lbs., and will support a board 3 by 4 feet without inconvenience. The spindle which slides up and down in the column can be raised and lowered with ease, and held firmly by the set-screw on the right. The screw on the left immediately above passes through the collar which turns on the top of the column. When this screw is set up, and the others turned back, the top of the stand can be easily turned as the convenience of the workman requires. By means of the hand nut immediately under the board, the work is set at any inclination. It is but a minute's work to adjust it for standing or sitting, which is very desirable for the comfort of artists. It is mounted on casters, and its tasteful appearance makes it equally desirable in the office, counting-room, library, or sitting room.

Manufactured only at the Washburn Machine Shop connected with the Free Institute of Industrial Science, Worcester, Mass. Address, for further information, M. P. Higgins, superintendent.

Repairing the French Atlantic Cable.

The steamship *Robert Lowe*, belonging to the Anglo-American and French-Atlantic Telegraph Companies, returned to the Thames a short time since, after repairing the American section of the French-Atlantic cable. This work was not done by Captain Blacklock without experiencing several difficulties. The exact position of the cable was not accurately marked on the chart, because the faulty portion had been laid in a thick fog. After dragging for it for some time, it was however hooked, and found to be in good electrical condition to St. Pierre; the fault was shown by the electrical tests to be twenty-five miles off, in the direction of Duxbury Beach. The St. Pierre end was buoyed, and then Captain Blacklock proceeded to wind in the cable with the picking-up machinery. After about twenty miles had been brought on board, a ship's anchor came up attached to the cable, and to free it from the anchor the cable had to be cut.

The picking-up was then proceeded with, and at last the fault was reached. At the faulty part the cable had been wilfully damaged and hacked, probably by some captain who had hooked it with his anchor, and had damaged it in freeing his ship. At the time the fault was reached, the barometer fell, and it was plain that a storm was at hand. The end of the cable was therefore buoyed, and soon the storm was felt in all its force. One of the boats was swept away, and the men on the deck were frequently up to their waists in water. It was some days before the weather moderated sufficiently to permit the cable repairing operations to be resumed. The buoy could not be seen, but the cable was grappled once more, the splice made, the cable on board paid out, and the St. Pierre section reached. Then another splice was made, and the loop of the repaired cable dropped overboard.

Capt. Rowett, at the late meeting of the British Association, read a paper on Ocean Telegraph Cables, the object of which was to show the superiority of hemp over metallic cables. He contended that hemp cables were much lighter, and extremely enduring when submerged, and iron cables were quickly corroded by the action of the sea water. Various specimens of submerged cable were exhibited by the author, in support of his views.