

# Scientific American.

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## Steam versus Water Power.

Various correspondents have made inquiries respecting the relative value of steam and water power; and one asks:—"Whether an inexhaustible water power or only water sufficient for steam purposes, with an unlimited supply of cheap fuel, are most advantageous to the development of a manufacturing town."

It is not possible to give a satisfactory reply to a general inquiry respecting the comparative advantages of steam and water power, but we have no hesitation in answering the correspondent (in Iowa) from whose letter we have quoted the above extract. An abundance of cheap fuel and steam power, in our opinion, possesses the greatest advantages for manufacturing purposes. Few manufacturing operations can be carried on without fuel, even where there is plenty of water power; therefore where fuel is scarce and dear, manufacturing cannot be carried on but under a heavy expense.

In giving this opinion we do not forget that most of our manufacturing towns and villages are indebted for their rise to water power. They are built on rivers and creeks where there are falls of water for driving machinery, but when they were first established, timber for fuel and building was plentiful and cheap in their neighborhoods. It has now become a serious question with many manufacturers, using water power, that their supply of water is becoming more unstable every year, as the forests are cleared off; and in many places where water power was exclusively used a few years ago, auxiliary steam power is required during certain portions of the year, on account of a deficient supply of water.

Forests and swamps are perennial feeders of creeks and rivers. As these disappear, and the soil is spread out to the direct rays of the sun, rapid evaporation takes place after falls of rain, and thus it has occurred that many streams once flowing with power for the miller are now only water-worn channels. The ruins of grist and saw mills are now to be seen on the banks of dry creeks, where forty years ago the merry clatter of the hopper and hum of the saw mingled from morn till night with the song of the rushing waters. But although this is true respecting a number of places, manufactures have not decreased in our country, thanks to the power of steam.—With a plentiful supply of fuel, steam forms a constant trusty power for driving machinery, and a steam factory can be erected independent of rare natural localities, like water-falls. It has thus great advantages over water power.

It requires 180,000 cubic feet of water per hour on a 13 feet fall, to produce the same effect in driving machinery that can be obtained with 50 cubic feet of water and 300 lbs. of coal, by a steam engine. While the power of water for manufacturing purposes is growing weaker and weaker in our country, that of steam is growing stronger and stronger. We have read a statement that in the year 1800 there were only three steam engines in all the United States; who can count them now? They number tens of thousands. Steam factories can be conducted in or near cities and commercial marts, and thus effect a great saving in transporting raw material and goods. There are various manufactures, however, which need considerable water to carry on, such as calico printing, bleaching, carpet-weaving, woolen cloth making, &c. The scouring, washing, and dyeing require much water, but then with steam such factories can be heated, the goods boiled and dried, and taking the expense of keeping dams and water wheels in repair, we are of opinion that steam power, where fuel is cheap, is to be preferred in nearly every case to water power. At any rate, there can be no doubt but steam factories must increase in or near our coal regions, and ultimately these will become the great seats of American manufactures; just as the coal regions of England have become the centers of

manufactures in that country. And as we have the largest coal fields in the world, and these scarcely touched yet by the tool of the miner, it makes us hold our breath to contemplate the vast manufacturing power—the hundreds of Sheffield, Birmingham, Manchester, Leeds, and Glasgow—that will yet arise in our country and make it (on account of its cheap fuel) the greatest manufacturing nation on the globe.

## To the Public.

There are a number of slothful, inefficient, inexperienced persons, calling themselves patent agents, in different parts of the country, who manage to make a scanty living by circulating falsehoods in respect to us, and our mode of conducting patent business. They tell people that the Scientific American folks do so large a business and are so over-run with clients that they cannot give to each one, that attention or promptness that his case requires.

This is a very plausible and specious story, but we denounce it as untrue, and those who circulate it as falsifiers. Just the reverse is the truth. No Patent Agency in the country possesses better or more abundant facilities for the preparation of patent papers and no other individuals engaged in the business, bestow more professional care or attention upon their clients and cases than ourselves. Each particular subject receives the most careful study and deliberation, and when complete is promptly despatched. In proof of this we point with pride to the extraordinary success which attends our exertions. If we were negligent, inattentive, dishonest, or in any manner slighted the interests committed to our care, we should long since have ceased to possess the confidence of the community, instead of standing, as we now do, at the head of the Patent Agency business in this country.

Envious and deceiving persons may carp and rail at us to their heart's content, but they cannot alter the fact that the Scientific American Patent Agency is, by far, the best, the most prompt, the most successful, and the most moderate in its charges of any in the country.

## The Woodworth Patent.

This odious monopoly expires by its own limitation, on the 27th of December next. Congress meets December 1st. The monopolists, we understand, are secretly but actively at work, endeavoring to organize a new combination to press a bill through Congress for another extension of the patent. They hope to have the bill passed between the 1st and 27th of December, for after that date their game will be up. We shall oppose the schemers, as heretofore, and expect to be able to head them off. But we request that all who are opposed to the monopoly will second our efforts, by calling upon Members of Congress, now that they are at home, explain the case, and put them upon their guard.

## Recent American Patents.

We omit our usual reports under this head, and give place to extended notices of the varieties at the great Exhibition of the American Institute at the Crystal Palace.

## Great Exhibition of the American Institute at the Crystal Palace, New York. FOURTH WEEK.

We have to report still further additions to the stock of contributions on exhibition, consisting of new machinery, engines, &c. The number of visitors has greatly increased. The evening attendance, especially during the three last days of the week was very great. On these occasions the spacious building was, at times, so crowded as to be uncomfortable.

## Steam Fire Engines.

Lee and Larnard's engine, of this city, has been placed on exhibition since our last. We are informed that a trial between this machine and that of Silsbie, Mynderse & Co., noticed last week, will shortly take place.

## Boiler Incrustation Preventer.

E. W. Sargent, 17 Broadway, N. Y., Stewart Kerr, Agent, exhibits Weissenborn's Patent Boiler Incrustation Preventer. This consists of an apparatus of cylindric shape, somewhat like a stove, through which the water passes previous to entering the boiler. While passing through the apparatus the water is

subjected to mechanical filtration, and also to chemical action, heat, agitation, and friction being combined, whereby a perfect separation of the incrusting salts and foreign particles is effected, and the liquid perfectly purified. This invention is in use in several parts of the country, and is said to work with entire success. It prevents incrustation in boilers, no matter how highly impregnated the water is with lime or other substances. The salts are deposited in the purifying vessel, and the boiler kept completely clean. Many specimens of the salts and other impurities deposited in the apparatus are shown at the Palace. For engraving and full description see SCIENTIFIC AMERICAN, Vol. XI, No. 15.

## Post Boring Machine.

Mr. James Bell, of Birmingham, Pa., exhibits one of I. W. Ward's patent machines for boring slots in fence posts, to receive the ends of the fence rails. Two augers are employed, which are rotated by a crank. The construction of the machine is such that slots of varying lengths may be bored, at pleasure, while the work is done with nicety and expedition. This machine is chiefly intended for use in putting up common farm post and rail fences. It is simple, easily managed, weighs but little, and is strong and durable. Price \$16 and up. The exhibitor furnishes visitors with a handbill containing a poetic description of the machine, which is quite amusing. For engraving and description see SCIENTIFIC AMERICAN, Vol. XI, page 280.

## Rope Machines.

Mr. Thomas G. Boone, of Brooklyn, N. Y., exhibits in operation his new machine, for which he obtained Letters Patent July 15th, 1856. It operates admirably. The construction is quite different from other rope machines. Neither the spools that contain the strands, the capstands, or circler revolve in the direction of the twist. A good and even fore-haul is put in with the lay. The machine does about twice as much work as usual, occupies only about one half the ordinary space, requires only half as much power, is simple, more easily managed, etc. Price \$400 and up, according to size.

Mr. Wm. R. Dutcher, of Troy, N. Y., exhibits one of his newly patented rope machines in operation. The improvements are of such a nature as to increase the rapidity with which the rope is made, improve its quality, lessen the number of attendants, power required, &c.

## Drop Press.

Milo Peck, of New Haven, Conn., exhibits in operation one of his patent Drop Presses, for stamping sheet metal. It is a strong and effective machine. The main shaft has a constant rotary motion, and lifts the weight.—There is a spring at the top, which holds the weight when it comes up, and prevents it from falling, although the shaft continues to rotate. The weight is discharged by a cord or pedal, which the attendant touches for that purpose. The machine on exhibition works well, and appears to be under perfect control of the operator. For an engraving and full description see SCIENTIFIC AMERICAN, Vol. XI, No. 18.

## Parallel Vise.

Mr. Wm. H. Schofield, Agent, of Yellow Springs, Green Co., O., exhibits Davis' patent Parallel Vise, which appears to be a first rate implement. The long screw is dispensed with, the jaws always move on a parallel line, it is opened and closed in a much briefer space of time than the common vise, is cheap, simple, and durable. For engraving and full description see SCIENTIFIC AMERICAN, Vol. XI, No. 16.

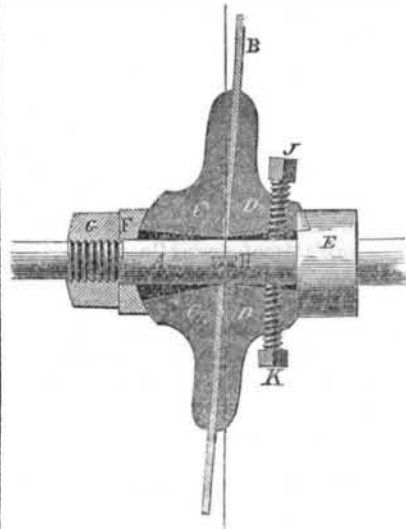
## Lathe Chuck.

Messrs. E. Horton & Son, of Windsor Locks, Conn., exhibit samples of their lathe chucks for centering. The jaws are moved in and out from the center by screws, and the latter are furnished with pinions, which gear with a cogged ring, so that when one screw is turned by hand, all the jaws will move. The chuck box or shell is composed of two parts, and when required may be taken apart, and the cogged ring removed. Each jaw may then be moved independently. Price \$20 for chucks of 6 inches diameter, and upwards, according to size.

## Portable Saw Mills and Sawing Machines.

Pinney Youngs & Co., Milwaukee, Wis., exhibit, in operation, one of their portable saw mills. It attracts great attention. The saw employed is a circular one, and the arrangement is such that it cuts both forward and back. The setting of the log, after each cut, is done by mechanism, so that the machine is self-acting in nearly all respects. We are told that logs can be placed upon the carriage, and rapidly cut up into boards without labor on the part of the attendant, except to carry away the lumber. It is said that these machines will cut from 2000 to 2,300 feet of siding per hour. This is great speed. The machine is simple, easily taken apart and set up, occupies little space. Price \$1000 and upwards, according to size.

Channeling Saw.—Mr. George Hutton, of Morrisania, Westchester Co., N. Y., exhibits in operation a circular saw arranged for cutting grooves of varying widths and depths, and for other purposes. The novelty consists in a peculiar arrangement for changing the relative angle between the saw and its arbor.



In our engraving A is the arbor, B the saw. The vertical line shows the deviation of the saw from the ordinary position, at right angles with the arbor. C D are two collars which clamp the saw. Each collar is flat on the face touching the saw, and spherical on its other face. These collars may, when desired, be removed from the arbor. There is immovably fixed on the arbor an additional collar, E, one face of which is concave, so as to fit perfectly to the corresponding spherical or convex face of D. A washer, F, similarly concave, is slipped loosely on the shaft, A, so as to fit in the same manner against the convex face of the collar, C. A nut, G, screwed on A, presses against the plane face of F, and by the aid of this nut all the parts may be released or firmly secured, at pleasure. The movable collars, C and D, must have considerable thickness, so that the convex faces thereof will be portions of large and not of small spheres, and also that the center of such sphere must coincide with the center of the saw. The shaft, A, is of such size as very nearly to fill the circular orifices on the plane faces, and also to fill the orifices in one direction on the convex faces, but in the other direction the oblong shape of the last named orifices allows considerable play.

When the collars, C and D, are placed together, the nut, G, being slackened to allow motion of the parts, the saw may be seized by the hand and readily placed square with the spindle, or as readily inclined over in one direction, but it cannot, by any force, be inclined in any other direction, by reason of the peculiar form of the cavities described. This device allows also of adjusting the obliquity of the saw by percussion, which is, in some accounts a superior agency for this purpose. In order to adjust the saw it is necessary to slacken the nut, G, but yet allow it to press so as to confine the parts with moderate force and strike with a mallet against either of the movable collars, C or D. By this means the amount of obliquity desired may be obtained with accuracy, after which the nut, G, must be screwed very tightly to its place. When thus screwed up, the pressure against the parts is sufficient to prevent any change, until the nut is again slackened. When it is de-