

## CITY OF LONDON LIBRARY AND MUSEUM.

Our engraving gives a view of a handsome edifice adjoining Guildhall, London, recently erected by the corporation of that city as a depository of their very valuable library and museum.

The style is gothic, to accord with the Guildhall, and the external facing, stone. The museum is on the lower floor, and is over 83 feet long by 64 feet wide. The library is above it, and is 98 feet long and about the same width as the museum. Adjoining the library are a public reading room, 50 feet in length, and a commodious committee room. A flight of stairs leads from the library to a vestibule opening into the Guildhall. Below are strong rooms and apartments for muniments and archives.

This commodious and appropriate building has reflected credit upon all engaged in its erection, and we would like to draw to it the attention of our own architects of public buildings.

The city architect, Mr. Horace Jones, prepared the design, and the contract to complete the building, in accordance with it, was entered into for £21,360.

## Improvements in Wheel Making.

One of the difficulties in making light carriage and buggy wheels has been to get a tight spoke and felly joint. One reason why this so often fails, and so many poor jobs are made, is, that if a round tenon fits very tight in a round hole, the driving on will often split the felly. This often occurs with the very best straight grained timber.

All wheelwrights know how very difficult it is to put on a light hickory felly tight and not split it. If, however, they are not split when put on, carriage makers know how often they give way afterward, and how many light carriages are disfigured by the bulging and swelling of the felly at the tenon of the spoke.

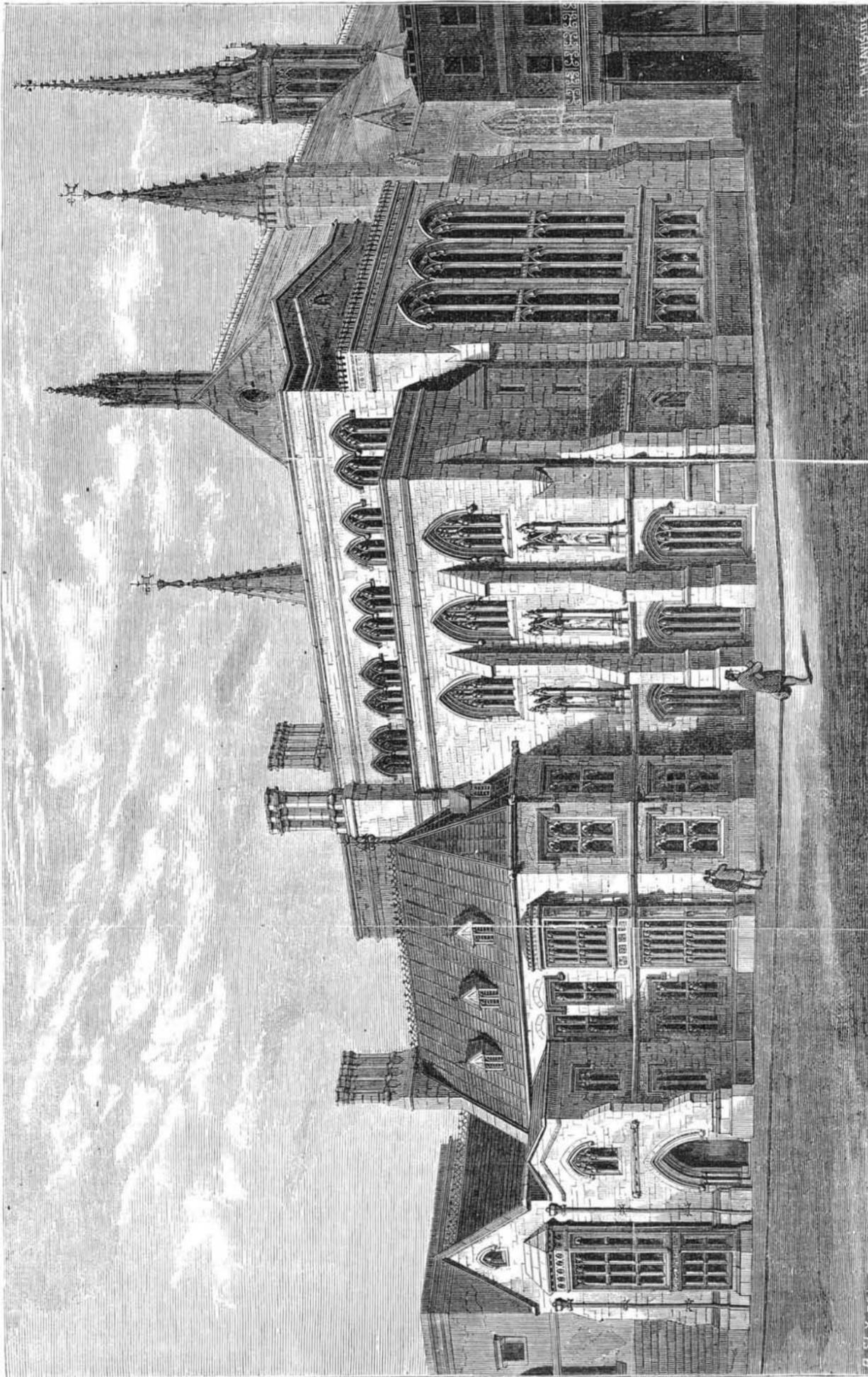
As a remedy for this difficulty, Mr. Jacob Woodburn, of Indianapolis, has applied to the Sarven wheel the following new principles, which are claimed to work very advantageously. Of the first he writes: "We make a tight joint, first, by making the tenon of the spoke oval; and, instead of doing this by filing and shaving, which is untrue and uncertain, we have a machine that turns the tenon perfectly smooth and

true, and as oval as may be required. An intelligent mechanic at once sees the benefit of this. The hole is round, the tenon is oval; thus the wedging pressure of the tenon is upon the ends instead of upon the sides of the fiber of the wood, preventing, to a considerable extent, the swelling and splitting of the felly."

This idea, of making the tenons of spokes oval instead of round, appears to us to be a very practicable one, and it admits of wide application. Why would not every wheel be stronger with its spoke tenons ovaled? The points where the spokes connect, with the rim at one end and the hub at the other are the two weakest points in the wheel; but, in the Sarven wheel, this weakness is mostly transferred from the hub to the rim. This is why the oval tenon is particularly valuable in the Sarven wheel; but the same principle

applies to all wheels. The second invention of Mr. Woodburn will be best understood by the following description by himself. He says:

"Our long experience in making wheels has shown us that, while the oval tenon is a very great improvement upon the common method, yet it only partially removes the difficulty. The best timber, under the extraordinary pressure and strain brought upon it by rough roads, crossing the rails of street railroads, etc., will sometimes split, and, this giving way, the spoke becomes loose. This is a great annoyance and expense to the owner of the carriage, and mortification and damage



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## Thread Cutting Tools.

Many carriage makers are in the habit of paying but little attention to their thread cutting tools; but the thread of a bolt or clip or nut will bear no more tampering with than the mainspring of a watch, and to attempt cutting threads upon bolts or clips with an imperfect screw plate, or to attempt cutting a nut with a worn out or useless tap, is nothing more than tampering with the thread. We would say to any correspondent on this subject, that he can himself repair his screw plates as well as any other person. To reproduce the thread in the dies, if they are heavy enough to allow of it, first reduce

the temper by annealing. A good and easy method of doing this is to place sawdust in a metallic box, heat the dies to the required heat and deposit them in the sawdust, and let them remain until they are perfectly cool. After the dies are annealed, we reduce the dies in width just sufficient to allow of the removal of all the old threads; after which we place them in the plate and commence cutting the thread by means of the plug tap. To cut with a taper tap would not be so effective, and would have a tendency to strain the dies and their bearing on the slide of the plates.

The following are the standard threads of this country:  $\frac{1}{8}$  in. diameter, 24 threads to the inch;  $\frac{3}{16}$  in. diameter, 22 threads to the inch;  $\frac{1}{4}$  in. diameter, 20 threads to the inch;  $\frac{5}{16}$  in. diameter, 18 threads to the inch;  $\frac{3}{8}$  in. diameter, 16 threads to the inch;  $\frac{7}{16}$  in. diameter, 14 threads to the inch;  $\frac{1}{2}$  in. diameter, 12 threads to the inch;  $\frac{9}{16}$  in. diameter, 10 threads to the inch; and so on until we arrive at  $\frac{3}{4}$  in., after which the V shaped thread is unsafe, and the square thread is substituted.

It is better to have the plug tap with which the dies are cut a trifle larger than the diameter of the bolt desired to be cut. The concave on the dies must not be made so that they will be perfectly round, and allow the edges of the dies to meet while the tap is inserted. Unless the object is to have the bolts all the same size, there must be some space allowed for cutting them smaller, by a trifle, than the standard.

The tempering of the dies is a simple process. First heat and cool off; brighten a little with sandpaper or brick dust, and reduce to the required temper by placing on a bar of heated iron, and cooling off when the pro-

per temper is arrived at. To temper taps, the wood or oil process is, in all probability, the best.—*The Hub*.

**THE WONDERS OF THE TELEGRAPH.**—A correspondent at St. Louis, Mo., gives us the particulars of the sending of telegrams from that city to Hong Kong in China, and the return of answer, the time each way being only 4 hours, the message being sent and reply received both during the same day.

**EBONIZING WOOD.**—A simple method is to procure an ordinary slate and hold it over the gas, lamp, or candle, until it is well smoked at the bottom, scrape a sufficient quantity into French polish, and well mix; then polish your article in the ordinary way. If there are any lumps, gently rub them down with your finger, and apply another coat.

to the manufacturer of it. This difficulty has been met by our patent felly rivet, which makes it impossible for a felly to split. A tight fitting wood screw, with a sharp thread, is put through the felly, on each side of every spoke in the wheel, making over twelve feet of rivet in every set of wheels. This screw, after being tightly put in and firmly imbedded in the fiber of the wood, is cut off smooth on each side of the felly, so that when the wheel is painted it is not seen. This makes the joint more secure than the method of putting a bolt, with head and nut, to every spoke, and detracts nothing from the beauty of the wheel.—*The Hub*.

**READING** makes a full man, talking a ready man. The happy medium is reached when a man reads enough to give value to what he has to say.

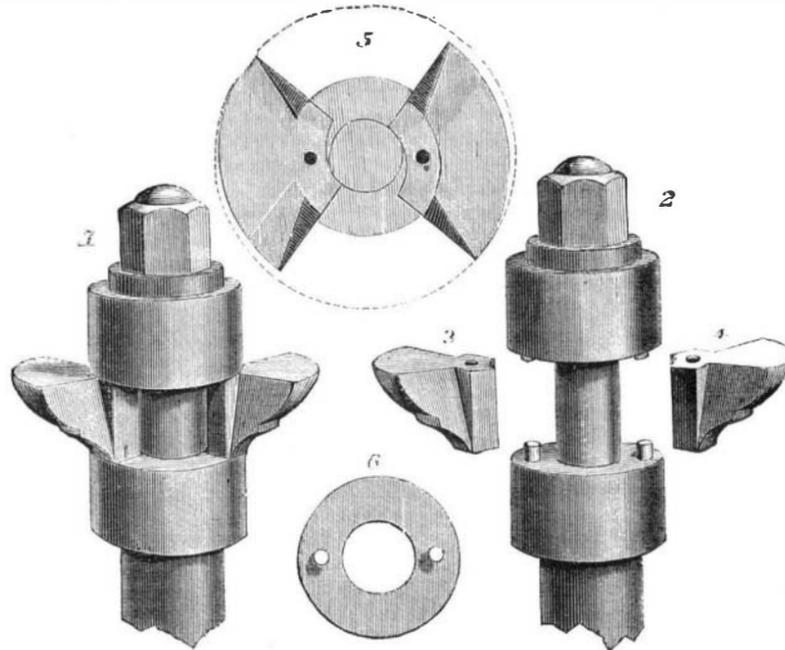
**Molding Cutter Heads.**

Our engraving illustrates an improvement in the construction of that class of "freezing bits," or rotary cutters for wood working machines, which are adapted to reverse, so as to present a cutting edge in either direction.

Fig. 1 is a perspective view of the improved cutter ready for work. Fig. 2 is a perspective view of the same, showing the collars ready to receive the bits. Figs. 3 and 4 represent bits removed from the collars. Fig. 5 is a cross section through the bits and spindle, the dotted lines showing the clearance. Fig. 6 shows the face of a collar, with the pins on which the bits are pivoted. Without further explanation, it will be seen how, by the peculiar shape of the bits and their connection with the collars, they are made to turn on the pivots, according to the direction of rotation, and stop (in either direction) when they present a clear cutting edge in front and clearance in the rear. When desired to reverse the action, the nut seen in the figures is slightly loosened, the bits are placed in proper position, and the nut again tightened.

For manufacturers of moldings, furniture and picture frames, this invention seems well adapted, and the inventor claims it to be equally important to all kinds of wood working. Patented April 16, 1872.

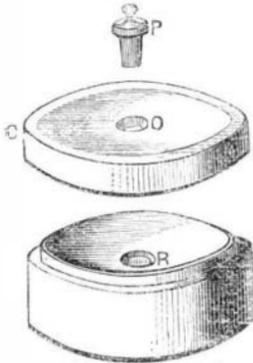
For further information, address Hope Machine Company, 181 West Second street, Cincinnati, Ohio. See advertisement in another column.



**CUTTER HEAD MOLDING MACHINE.**

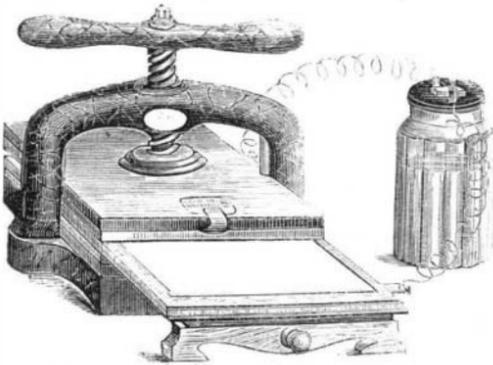
**RESERVOIR PALETTE.**

It is well known to draftsmen that it is evaporation, rather than use, that so rapidly diminishes the liquid, color, or ink; and moreover, the material particles or sediment are prejudicial to high class work. The reservoir palette is designed to remedy these defects, which it does perfectly by simple means. The reservoir is shown at R, in the body of the palette B, and consists simply of a cylindrical cavity filled by a plug, P, so that any water previously poured into it is expelled and rises on to the surface of the palette, where, in the usual way, it is prepared for use by rubbing with the stick of Indian ink or cake of color requisite. After the desired depth of ink, tint, or color is obtained, if left to settle for a short time, the sediment precipitates on the palette, and when the plug is withdrawn, the clear ink or colored fluid flows readily into the reservoir, where it presents a very small proportion of evaporating surface, combined with depth for dipping pens, etc. The cover, C, being put over the palette, the plug may be used to close the orifice, O; or a common marble is dropped on to it, which readily recedes on the insertion of the pen, and settles in its place again on the withdrawal of the pen.



**ELECTRO CHEMICAL COPYING PRESS.**

This press, the invention of Signor Zuccato, of Padua, Italy, differs but little in appearance from an ordinary copying



press, and that difference lies mainly in the construction of the upper and lower beds or surfaces of the press, of which the former consists of a plate of copper, and the latter of a plate of copper tinned, both on mahogany beds—the upper one being attached by lugs or clips to the solid iron press plate, and the lower being made to slide out as shown. These plates are placed in the ordinary way in the circuit of a battery, so that when brought into close proximity by the action of the screw, the circuit is completed and a current established over the whole of the surfaces.

But, by the aid of an insulating medium—a varnish—applied to a steel plate and removable by the action of a "style" in writing, printing, drawing, etching, etc., the electric current is confined to those portions only which are so denuded of the insulating protection; and here it is made to leave record of its passage by its continued action on the steel plate and sheets of copying paper specially prepared and damped with a solution of prussiate of potash. The electrolytic action causes the formation of the ferro prussiate known as the "Prussian blue," producing a perfect facsimile of the original manuscript or design wrought on the varnished surface of the plate.

The battery employed consists of a single cell, with zinc and carbon elements in an actuating solution of bichromate

of potash and sulphuric acid; and its positive and negative poles are connected in the usual way, by spiral coils of insulated wire, with the upper and lower beds of the copying press. The moveable steel plates, on which the writing,

expensive. Compared with macadam, it is believed that where the traffic is heavy, asphalt would prove the cheaper of the two. The effect of temperature does not appear likely to prove injurious in London, unless it be in the case of asphaltes of an inferior character.

The steepest gradient for which asphalt has been used in the city appears to be 1 in 46. There is a pretty good prospect that the extensive trial now being given to various descriptions of paving will demonstrate the question whether we have practically any other choice than granite or macadam. The success of asphalt would be an enormous benefit to the metropolis in the cessation of the wearying roar which accompanies the passage of heavy traffic over paved roads, and in the comparative absence of dust and mud. Horseflesh is also to be considered. M. Leon Malo, a French engineer, has computed that, if all Paris were paved with the Val de Travers compressed asphalt, the saving in wear and tear to horses and carriages would be \$1,700,000 per annum. How far the calculation is correct may be difficult to say; but of the economy of asphalt in its effects on horses and vehicles there can be no question. Its general use is a consummation much to be desired, and the present competition will doubtless tend to reduce the cost of this luxurious improvement in the art of road making. Our only fear is whether it will stand the hard work demanded of it; though it must be remembered that granite often has to be patched and

mended, and what is called "relaying" is a formidable affair.

**Remarkable Parasitic Fungus.**

A correspondent, Mr. A. J. B., of Kansas, sends us a box of specimens and says: Please find herewith what to me is a wonder as well as curiosity, in the shape and character of what is, with us in Kansas, known and called a common grub worm. A bed of them was found and dug up recently while setting posts in this town. The grub when found was just as he now appears, having no life or animation whatever, while the sprout, *quee*, or whatever it is termed, growing from near the head of the grub, was in a growing condition, and full of vegetable life and greenness.

We give a drawing of the specimen sent by our correspondent. The grub is the larva of a brown beetle, which feeds upon the roots of grass, corn, wheat, etc. The long sprouts from the head are fungi (probably *Sphaeria* or *Isaria*) which grow at the expense of the nutritive fluids, and therefore of the life of the animal. They are generally found in the interior of the body (hence called *entophyta*) and near the posterior end. The dreaded disease of the silk worm (*Muscardini*) is caused by a fungus. Hosts of the seventeen year locusts are destroyed by a fungous disease. "It is probable," says Dr. Leidy, "that this disease is one of the means of maintaining the equilibrium in the aggregate of the life of the species under existing circumstances." These "vegetable grubs" are something of a mystery to the naturalist, and more light is wanted. Professor Orton noticed a like phenomenon on the western slope of the Andes, near Quito. The fact that all animals are liable to fungous diseases, that there is in fact a *flora* within man, ten different parasitic fungi having been found in him, the recent investigations of able naturalists

on both sides of the Atlantic, and the lectures of Huxley and Tyndall, invest this subject with deep interest and importance.

**Proposed Government Boiler Experiments.**

Judge Bradley, of the United States Supreme Court, has made a valuable suggestion in his late letter to the Secretary of the Treasury on the subject of steam boiler explosions. He points out the absolute necessity of making a trial of steam boilers, of the size and kind generally used, to find the laws governing explosions and the means of preventing them, and cites the few experiments made at Sandy Hook as showing there is much to be learned by this method of investigation. He recommends Congress to appropriate \$100,000 for the purpose, and to authorize the Government to have a system of experiments made under charge of a board of skillful engineers.

**THE CURRANT WORM.**—A small yellow fly, with brown wings, about the size of the common house fly, deposits its eggs about May 1st. The worms appear about the middle of May. Remedy: Hold a pan under the brush and jar the branches; the worms fall into the pan and are easily destroyed. Repeat the operation as often as necessary. The larvae are supposed to burrow in the earth.