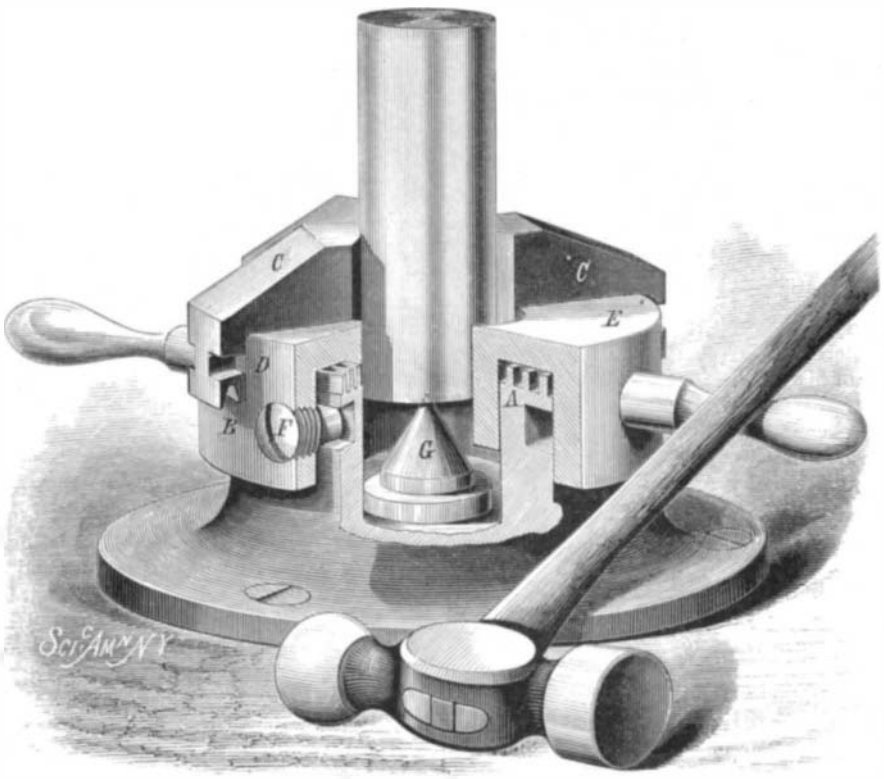
IMPROVED CENTERING CHUCK.

The annexed engraving represents an improved chuck for centering work before adjusting it on the lathe. The construction is strong and exceedingly simple, and the device generally is well calculated to save time and trouble. The lower portion or standard is rigidly attached by screws to a suitable bed. On its upper face are spirally disposed projections, A, in which engage recesses, B, on the lower surface of the jaws, C. Said jaws have side recesses which receive projections, D, on inner side of the mortises in the upper revolving portion, E, in which mortises said jaws work radially. Through said upper portion, E, pass the screws, F, their inner ends entering a groove on the standard, thus retaining the part, E, in place while allowing it to revolve.

It will be evident that when said portion, E, is rotated by the handles shown, the jaws will, by the spiral projections on the standard, be caused to move uniformly and simultaneously toward or from the center. In using the device the work is placed between the jaws, as represented in our illustration, and the latter are tightened. The object is thus adjusted so that its center rests directly upon the metal cone, G. It only remains to strike the work from above with the hammer, and the point of the cone makes the necessary indentation.

For further information address Mr. A. F. Cushman, Hartford, Conn.



IMPROVED CENTERING CHUCK.

Patented through the Scientific American Patent Agency July 14, 1874. Further particulars may be obtained by addressing Hinckley & Son, Dallas, Texas.

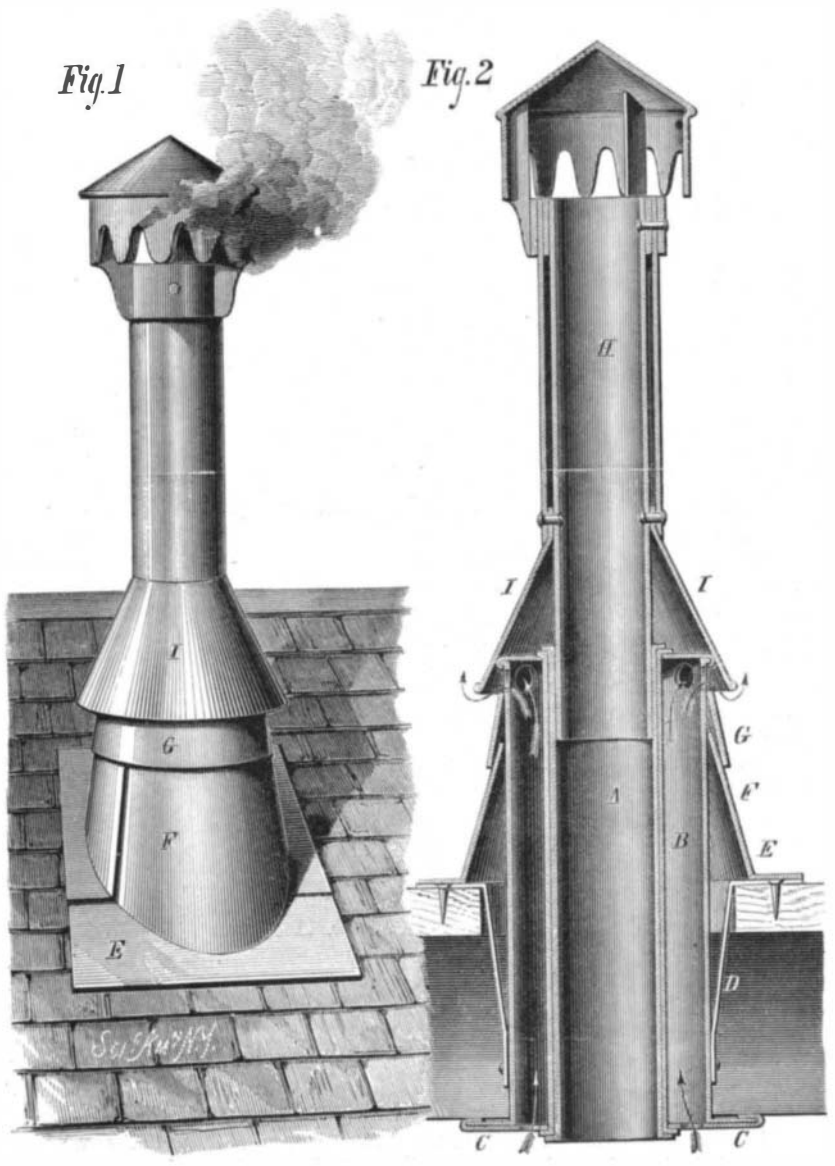
A New and Powerful Explosive.

We learn that M. Nobel, the inventor of dynamite, has recently discovered a new explosive substance still more powerful than that. He has given it the name of "explosive gelatine," on account of its aspect, which closely resembles gelatine. The substance is composed of 94 to 95 per cent of nitro-glycerine, and 6 or 5 per cent of collodion, mixed together. It is viscous, but can be easily cut with aknife or with scissors, and placed in cartridges or shells. Dynamite, it is known, has the disadvantage of being alterable by water—when it is moist the nitro-glycerine separates from the absorbent. The new substance, on the contrary, does not give the least symptom of exudation; it is impermeable to water, which does not at all affect its explosive properties. It isinflamed in the same way as dynamite, and its power is at least 50 per cent greater. Italy and Russia have, it is said, adopted this substance for charging bombs, torpedoes, etc.

COMBINED VENTILATOR AND CHIMNEY.

The accompanying illustrations represent a combined ventilator and chimney, which, we are informed, has been found economical, safe, suitable for light structures, and capable of being easily put up by any one. Fig. 1 is a perspective and Fig. 2 a sectional view; in the latter A represents the chimney flue, which is made preferably of tin lined with No. 24 sheet iron, the same being riveted through wherever the joints may lap. An outer casing, B, is suitably attached by a flange, C, to the ceiling, while the body and whole support of the chimney is held by supporting straps, D, firmly riveted to the outer casing, B, and fastened to the timbers or sheeting of the roof.

The water-proof connection of the casing, B, with the roof at the point of its passage through the aperture of the same, is made of two sheet metal plates, E, so constructed that they shall clasp the outer casing, B, from opposite sides. The upper plate laps over the lower one, and each is provided with its half of a collar, F, so cut and fitted to the same by soldering as to make a perfect water-tight connection independent of any soldering to the outer casing, B. The upper edge of the halves of the collar is secured by a close-fitting ring, G, or by any other suitable means. A chimney extension or tube, H, is fitted into or otherwise firmly attached to the upper end of chimney, A, and protected against the rain at its upper end by a cap or shed. Lower down on the same a second cap, I, is formed by the flaring out of an outer casing, so as to extend around and protect from rain the upper end of casing, B, and also the collars of the water-proof plates, E. The heat of the smoke and gases of combustion, passing up through the chimney flue, produces the heating of the air in the ventilating space around the same, so as to cause, by the rising of the air to the outside, a draught from the room, and thereby a ventilation of the same. The sheet iron chimney, A, having a tin casing next to the ventilating space, the corroding action of the air upon the outer surface of the same is prevented, and, being riveted together wherever the joints of either may lap, one strengthens the other, and a greater durability is attained thereby. The outer air casing surrounds the chimney complete, and not being dependent upon solder in any of its connections, the liability of accident by burning out of the chimney from the accumulation of soot is claimed to be rendered impossible. There being no contact of the inner flue with the wooden parts of the building, the danger of fire from the chimney is avoided.



COMBINED VENTILATOR AND CHIMNEY.

Water Supply of Cities.

The Prince of Wales has addressed a letter to the Society of Arts, suggesting an open discussion on this question, with a view to the consideration of some comprehensive scheme of a national character, by which the vast natural water resources of the kingdom might be turned to account for the benefit, not merely of a few large centers of population, but for the advantage of the general body of the nation.

Early History of the Steam Engine.

John W. Hackworth, who witnessed the trial of the "Royal George" locomotive in 1828, writes as follows to the London *Miller:*

M. Cugnot, a French mechanic, first produced a self-moving steam carriage in 1769, and the following year (under Government auspices) constructed a second, which conveyed artillery and passengers. William Murdock, of Redruth, Cornwall, made a working model machine of this class in 1785. In 1786 Oliver Evans, a native of Newport, Delaware, was granted by the Legislature of Maryland the exclusive right in that State of using steam carriages on common roads, and shortly after constructed one. Richard Trevithick—who had repeatedly examined Murdock's model—made a machine of this kind at Camborne, Cornwall, in 1802. Timothy Hackworth's "Royal George" locomotive, constructed for the Stockton and Darlington Railway Company, was started in September, 1827. It was the first that exceeded the efficiency of horse power, and frequently traveled more than twenty miles an hour. The following experiment with the "Royal George" was witnessed by Robert Stephenson, Joseph Lock, Timothy Hackworth, and myself, early in 1828, and was, at the special request of Robert Stephenson, inserted in Rastrick and Walker's printed report, which they laid before the directors of the Liverpool and Manchester Railway Company on March 7, 1829. Report, p. 17: "Hackworth's engine took forty-eight and three quarter tons at eleven and two tenth miles per hour on a level, and the steam was blowing off when the experiment ended." Remarks by Rastrick and Walker in said report: "We state the preceding as it has been given to us. Hackworth's engine is undoubtedly the most powerful that has yet been made, as the amount of tons conveyed by it compared with the other engines proves." Comparing the date of the "Royal George" (namely, September, 1827) with that of Sir Goldsworthy Gurney's common road engine (namely, July, 1829), it will be seen that nearly two years before the latter appeared the railway locomotive was an accomplished fact. Hence, had Sir Goldsworthy Gurney never lived, not one single detail of the railway locomotive would have been wanting, nor less perfect, nor its advent delayed five minutes.

New Mechanical Inventions.

An improved Rotary Valve for Steam Engines has been invented by Mr. D. W. Jones, of Pocahontas, Ark. It has an arrangement of steam passages in the valve, and ports and passages in the valve casing, by means of which the pressure on the valve is equalized or counterbalanced, so as to relieve the latter from friction.

A machine for Trussing Barrels has been patented by Mr. H. W. King, of Alden, N. Y. The object is to furnish means of rapidly applying truss hoops to barrels, and also for confining barrels during the process of heating. The machine has an annular head carrying a truss hoop, between which and a form on the head the upper ends of the staves are placed. A movable frame carries a hollow cone for driving down the truss hoops and giving form to the upper end of the barrel. There is a separable bed having a conical cavity, at the sides of which grooves are formed for receiving the hoops to be placed on the lower end of the barrel. The lower ends of the staves are contracted by a suitable device after the upper ends are secured. There is also a bed carrying a hollow cone for confining the barrel during the process of heating.

Improvements in Gigging Machines for Napping Cloth have been patented by Messrs. Christian Woelfel and James Massey, of Chester, Pa. The guide rolls of reciprocating napping cards are combined with adjustable bracket plates guided in recesses of the main frame and set by suitable screw gear, while the napping cards are reciprocated at right angles, or any other lateral angle of inclination, to the cloth by means of eccentrics and vertical shafts. These are improvements on patent No. 172,991.

Mr. A. S. Hickley, of London, England, has secured a United States patent for a new Electric Fire Alarm and Signaling Apparatus, in which the warning is given by a compound thermometric spring set to the required degree, making connection and sending an electric current to an ordinary clockwork alarm bell, when the temperature of the surroundings is raised by fire. The principle is not a new one, but is applied in a novel manner.

An improved Gang Wood Saw, making

two cuts at the same time, has been invented by Mr. T. F. Osburn, of Jerseyville, Ill. Two reciprocating saws work in a frame by means of slide rods driven by eccentric gearing. The piece of wood to be sawn is held in position by suitable holding and adjusting rods.

A new Coal Drill has been patented by Messrs. J. J. Rigney and William Hemingray, of Shamokin, Pa. It consists of a tapering and toothed cylinder, which is screwed into the coal by means of a wrench, and which carries the boring auger, the latter working by screw threads in a removable nut.

Mr. Cyrus Hunter, of Stonewall, Va., has invented a Steam Engine, in which the essential feature is a cylinder with closed heads and broken-out middle part, by which in reality two cylinders are formed, in which two separate pistons, with a single connecting rod and cross head, work. The valves are put in motion by the pistons, and are coupled together. The inventor claims a more perfect alignment by this arrangement, and freedom from the leakage and friction of the stuffing box of ordinary engines, none being required by the piston rod, as it does not pass through a cylinder head, partition, or abutment.

An improved Gas Lighter and Automatic Extinguisher, invented by Mr. G. S. Dunbar, of Pittsfield, Mass., is operated by an ingenious system of clock work, designed to work with regularity and effectiveness.

BROWNHILL'S BRICK MACHINE.

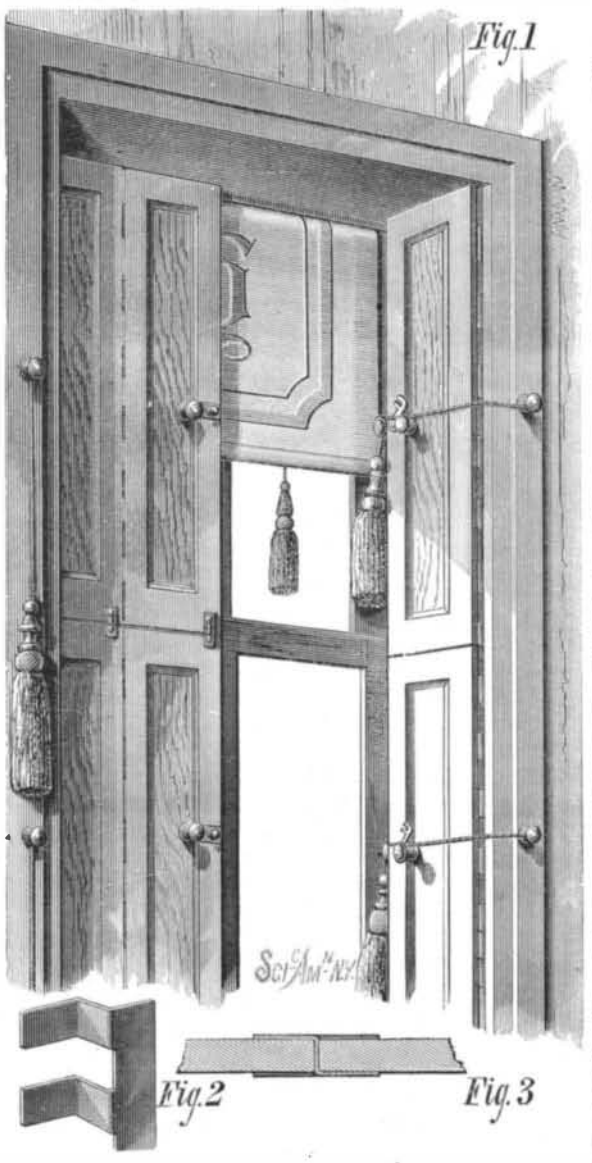
The machine shown in the accompanying illustration is the invention of Mr. R. W. Brownhill, of Walsall, England. Its most striking feature is the large margin of strength allowed in its construction, the dimensions of all working parts being so increased as to provide against great or unusual strain. Having thus provided for strength and durability, the inventor claims that the machine is capable of operating upon all kinds of brick earth in any condition, rough, ground, disintegrated, wet, dry, or semi-dry. Of course the quality of the bricks made ultimately depends upon the character of the material used; but, so far as the machine itself is concerned, the avoidance of the breakages and interruptions, so frequent with machinery of this class, is an essential point gained.

Referring to the engraving, B is a strong cast iron frame, with moulding box, S, cast on it. C C are slide boxes to guide the pistons, *e e*, which form two sides of the brick. The pistons are fitted with strong friction rollers. The pulleys, C *e*, and the chains and weights, G G, are to keep the pistons close to the cams cast upon the main shafts during their irregular motion. The hammer to drive the clay into the mould, S, works on the slides, A A, connected at the top by the cap, N; it falls during every revolution, and supplies and consolidates the clay through the hopper, E, into the moulding box,S, and between the piston pallets, *e e*. The hammer is operated by the helve, Q T, which works upon a reeler, R, turning upon a gudgeon, *g*. At the lower end of the helve, T, is fitted a friction roller to work upon the spiral, U, which is connected to the large spur wheel. By this means the hammer is raised and then dropped with the force of its own weight. The pallets, *e e*, deliver the bricks upon the band, P, which is worked by a small band pulley lifted at the moment when each brick comes out of the mould.

The operation of the machine is as follows: Clay is fed into the hopper, W. The screw revolving at the bottom of this hopper carries an adjustable quantity of clay into the hopper proper, E. Under this hopper the distance is regulated between the pallets for a regular quantity of feed, and it in reality becomes the mould. Just at the moment the pistons are in position the hammer falls, and forces the material into the mould. The motion of the cams causes one piston to retire while the other advances, and presses the brick. The retiring piston then entirely leaves the mould, and the advancing piston forces the brick out of the mould, to be taken away by the band before described,and thus completes one brick. The machine is adjustable in all its motions.

IMPROVED PAPER SHUTTER FOR WINDOWS.

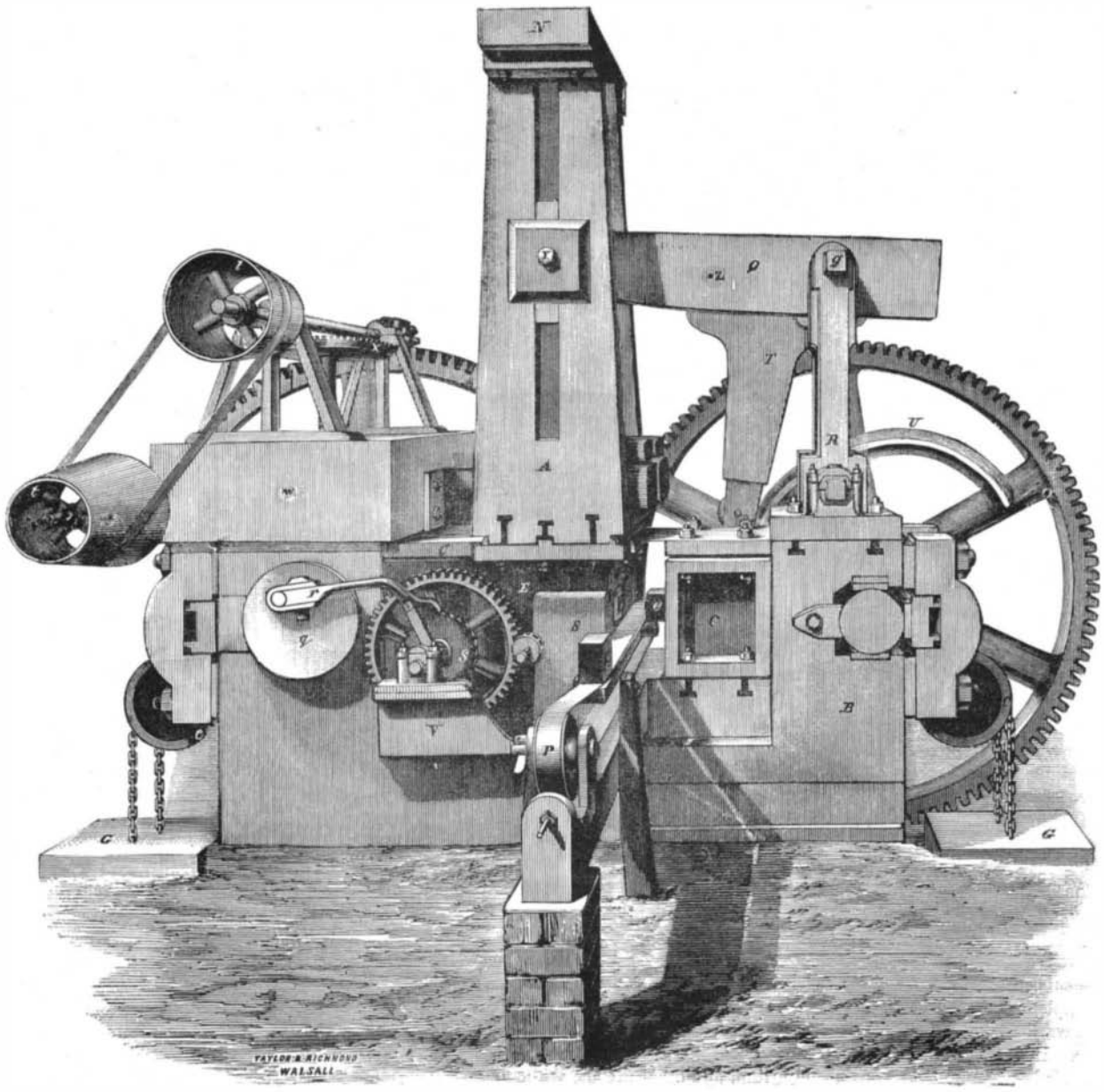
Our engraving illustrates a new adaptation of paper to building purposes, the same being the manufacture of the material into inside blinds or shutters for windows. A shutter composed of paper is claimed not to be so liable to be affected by shrinkage and expansion, and therefore is free from the disadvantages of binding or open joints. It is lighter and cheaper than wood, and it may be attached where wooden shutters cannot be. It admits of every variety of painting or ornamentation in set patterns ready for the trade, renewable at any time in similar manner to wall paper.



PAPER SHUTTER FOR WINDOWS.

The shutter parts are composed of panels or sections united by flexible joint hinges of cloth, as shown in Figs. 2 and 3. The strip of fabric is cut as shown with tongues, two strips being glued one on each side of the same section, and the tongues of each strip lapping on the opposite sides of the adjacent section. These hinge strips extend from top to bottom, as shown in Fig. 1. The panels thus joined are similarly hinged to jamb pieces for attachment to the jambs, which pieces are wide or narrow to suit different styles of windows, and are constructed with reference to the folding of the shutters. At the point of junction of the shutter parts, in the center line of the window, they are provided with rabbets to close the joint and shut out the view, and to prevent the shutter from springing or warping. The jamb pieces can also be applied upon the surface of the architrave, where the jamb is too shallow to receive the wooden shutter now in use. This is claimed to be an important advantage, as it permits of the application of inside shutters to any house without alteration of the windows.

Patented January 15, 1878. For further information address Messrs. Hipkins & Meek, Bellaire, Belmont county, Ohio.



THE BROWNHILL BRICK-MAKING MACHINE.

Japanese Textile Fabrics.

Calling attention to a fine display of Japanese woven and embroidered stuffs—the spoils of a temple and palace in the center of Dia-Nippon—exposed for sale in this city, Mr. Frederic Vors gives, in the *Tribune*, an interesting account of this branch of ancient Japanese manufacture. He says:

"Numerous articles have been written about the fictile, metal, and enamel productions of Japan, but little, until now, has been said of the proficiency of the Japanese as weavers and manufacturers of textile fabrics. For years past we have been familiar with Japanese silks, such as were offered for sale in drygoods stores, especially made for the European and American markets; but what has been excessively scarce and almost unknown until now are the woven stuffs, brocaded dresses, and embroideries that were worn by the princes and daimios of a period at which the most remarkable manufactures were made, like Sèvres porcelain, only for presentation pieces, or for the use of crowned heads.

"For the artist and the collector the study of such stuffs affords an unusual interest, for it shows even to better advantage that subtile quality of ornamentation which makes Oriental art so interesting. The first impression received on seeing these superb textures is one of exquisite delight at the perfect harmony of design and color, but, as the eye wanders over the stuff, new details appear in every spot. The color of the groundwork changes, and so does that of the ornamental pattern, but on several yards of stuff the same juxtaposition of color between the ground and the ornament will not be repeated, thus affording great interest to the observer. The robes of the princes were of large dimensions—which seems singular when we think how low in stature the Japanese race is—and cut square, for their artistic sensibility is so acute that they could not have the heart to cut 'bias' through a beautiful pattern. This detail is not without interest, for we can take the dresses apart and use the wide bands of stuffs for decorative purposes. The lining used for each dress is always in perfect harmony with the outside hues of the garment, which offer the most striking variety even in one single piece. The dresses of musicians, jesters, priests, and lords, though cut in the same shape, are ornamented with suggestions of the occupations of the wearers. Some are so heavy with gold brocade that their weight is nearly sufficient to bear a man down, but in all cases that most exquisite harmony of color, which is such a relief to us after all the dogmatic art we have suffered under so long, is carried out in the most delightful