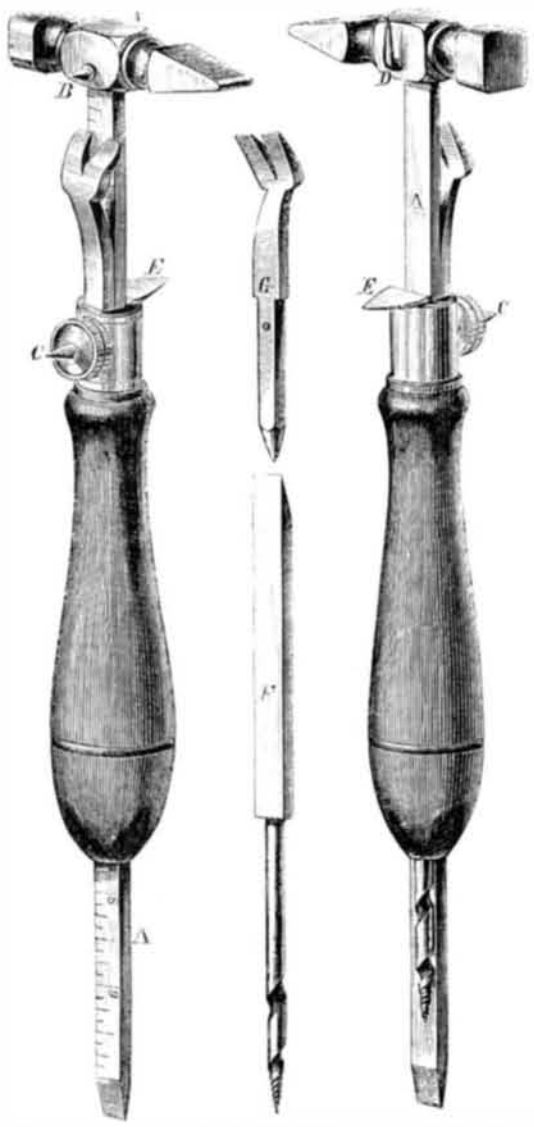
STOCKWELL'S IMPROVED COMBINATION TOOL.

This is one of the numerous family of tools designed to economize space and material, by making the parts applicable to various uses. It is a combination of a tack hammer, square, rule, screw driver, claw, marking awl, chisel, gimlet, can opener, compasses, and washer cutter.

The nose of the hammer is made flat on the bottom, and set at right angles with the shank, A. The shank is made of steel, and divided into inches and eighths of an inch. This construction gives the square and the rule. On one side of the hammer head is a point, B, and a similar point is made on the head of the milled set screw, C. By loosening this screw, the shank, A, may be drawn out or thrust in to adjust these points to different distances, so that circles of various sizes can be marked out with them, as with compasses.



On the opposite side of the head is a pointed hook, D, which, in connection with the blade, E, forms the can opener. The pointed hook is thrust through the tin plate, as near as may be to the center of the top of the can, and the blade, E, being pressed down through the tin, a sweep of the handle cuts out a circular disk, through which the contents may be taken out.

The end of the shank, A, opposite the hammer head, is formed into a screw driver. Loosening the set screw, C, allows the shank to be taken ont of the handle, when the chisel and gimlet, F, may be taken out. When either the chisel or gimlet are required to be used, they may be placed in the handle and held by the set screw, C, as the shank, A, is held when the hammer is used. G represents the claw, which has at the opposite end a marking awl. This can also be used by fixing it in the handle with the set screw. By turning the handle so the knife will be on the same side as the point, or hammer, it can be used as a washer cutter for pump valves, wagons, etc.

The whole forms a neat, compact, and convenient implement for domestic use, and would form an excellent addition to a tourist's or traveler's chest, in countries remote from the usual facilities for repairs of small articles afforded by civilization. It is useful also for coachmen and teamsters, comprising, as it does, a tool requisite for repairing carriage harness, etc.

Patent allowed, through the Scientific American Patent Agency, April 12, 1870. For further information address G. W. Stockwell, inventor, Lock Box 43, Natchez, Miss.

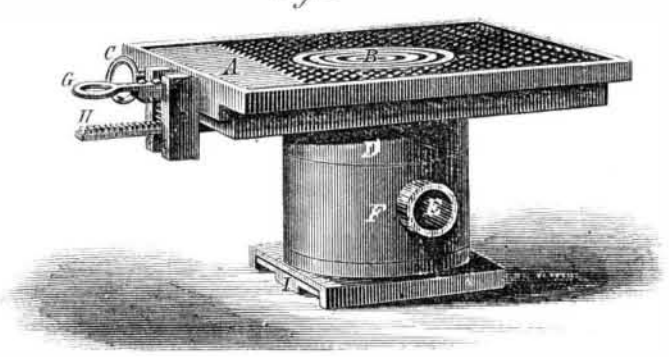
Paper Hangings.

Impressed gold papers, printed with finely-engraved brass dies, have been lately introduced, and for workmanship cannot be surpassed. Apart from their richness, there is no attempt at shadow, which should always be avoided. The ground colors are laid in a careful and superior manner, and a soft good effect is obtained. The specimens of flock paper are the reverse of the impressed gold; for as in one case the gold leaf is pressed by a warm cylinder into the ground color of the paper, so the relief effect accompanied by real shadow is produced by printing the block in size and flocking the same, repeating each process several times until the desired relief is formed. The pattern is then in relief in white flock upon a sized white paper ground. It is very easily applied to the wall, and especially suitable for panel decorations; it may be finished after being sized with ordinary glue size, and one coat of paint to prevent absorption in any tint of distemper color, or finished in paint, and relieved with color and gold according to taste, finished as the style of the room or staircase may require. The newest French paper-hanging patterns are raised in relief, and some have edging of gold as embroidery, producing the exact effect of *appliqué* work.

KAY'S PATENT REVERSIBLE SLIDE VALVE AND SWING GRATE.

It is a well-known and acknowledged fact among all blacksmiths, that much time is necessarily lost in changing from a smaller to a larger heat. This fact is easily accounted for when we remember that, by the construction of other tweer irons, the opening in the tweer plate, through which the blast issues, remains unchanged, however much the force of the blast may be increased, so that, while the fire directly above the place from which the blast issues may be at a melting heat, it is only spread by ignition from the center and not by a direct blast under every part of it; and even when the desired surface of fire is obtained, while it may be of sufficient heat to smelt the iron directly above the opening, the parts adjacent to the center may not have reached the desired heat, thereby giving an uneven and unsatisfactory heat to the whole. This is only partially obviated by frequently turning the iron, a very difficult and laborious operation when the piece is either large and cumbersome, or of inconvenient shape for thus turning.

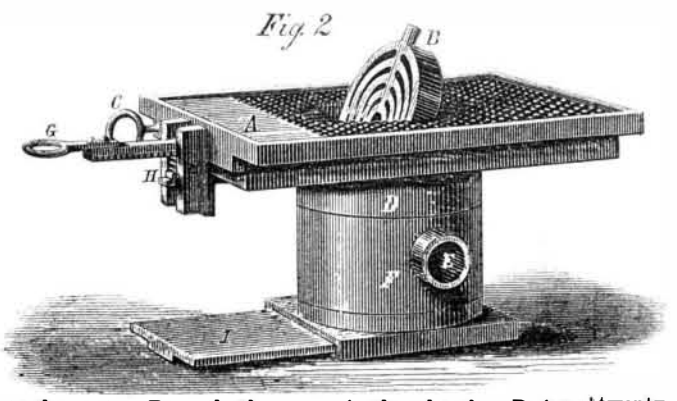
Fig. 1



The apparatus of which we give an engraving has been, we are informed, thoroughly tested, and found to not only obviate the difficulties above mentioned, but by it a larger or smaller surface of fire, with an even blast under every part of it, can be obtained. It can be used with Lehigh pea coal as well as with the Cumberland or sea coal, now generally used, thereby giving to the blacksmith the peculiar and well-known advantages of a Lehigh fire, of which, those using a tweer have heretofore been deprived.

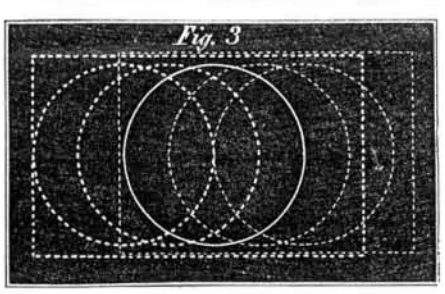
Fig. 1 represents the apparatus closed. A is the upper plate which forms the bed of the fire, and in which is placed a swing grate, B, pivoted so that the grate may be turned as occasion may require, to the position in Fig. 2, it being held in position by a rod, C, working through the bed, and fitting

Fig. 2



into the grate. Beneath the grate is the chamber, D, into which wind is admitted, through the adjustable collar, F, from the blower, by means of the pipe, E. Between the air chamber and the grate are arranged two slides, to each of which a rack, G and H, respectively, is fixed, and between the two racks a pinion is arranged, so that by moving one of the slides the pinion is turned, causing the movement of the other slide in the opposite direction. Through the two slides is formed a circular opening of the same diameter as the grate opening; the openings are represented in Fig. 3—the upper

Fig. 3



slide with heavy lines, the lower slide with light lines. Now if the upper slide be drawn out by the handle, G, attached to it, from the position shown in Fig. 1 to that shown in Fig. 2, the openings in the two slides come directly one over the other, opening to the fullest extent the communication between the air chamber, D and the grate, B. In Fig. 2 the pin, C, has been drawn out, in order to allow the grate, B, to revolve and empty the ashes and scales through the opened slide, I, to the floor beneath, whenever the fire needs clearing; when this is not needed, but only the greatest amount of blast is required, it will not be necessary to change the position of the pin, C, and the slide, I; but by merely drawing out the handle, G, the blast and surface of the fire may be enlarged to any extent desired. In this movement the opening commences at the center, each slide opening from the center; the space opened is double the movement of either slide, and when the slides are opened to any required space, as denoted by the broken lines in Fig. 3, the wind is admitted centrally on to the grate, and the force of the blast spread equally under the fire by means of a cross piece in the collar, F; by which, as will be readily seen, a circular blast of any desired size, may be obtained, always enlarging from, or diminishing towards, the center of the fire, so that the blast is directly under the whole of the fire, rendering one part as hot as another, and giving an even heat to the whole. Every tweer is furnished with three grates—one for spreading the fire, one for concentrating it, and one of a pyramidal form, in order to allow the ashes and fused metal to slide off and not obstruct the blast by filling up the gratings while welding heavy pieces. This device is also a very cheap one; its price being, we are told, only twelve dollars.

This invention was patented June 8, 1869, by Joseph Kay, 34 Pearl street, New Haven, Conn., to whom all orders may be addressed; or to Mr. H. B. Bigelow, machinist and boiler maker, Grapevinepoint, New Haven, Conn., where it may be seen in operation.

Construction of Sky Lights.

The *Architectural Review* says: "the square sky light, properly constructed has advantages over the spherical or any circular form, being more thoroughly water-proof and far more easily set than the latter. As to the suitableness of the spherical form, to shed light in the back part of a store, we do not think it equal in *effectiveness* to the square sky light, although it is, to a certain extent, effective enough.

"While noticing this subject we would also refer to sky lights as applied to the lighting of several stories of a building. The number of stories must be taken into account and the hight of each and all collectively; whether there are any obstacles to the admission of the light perpendicularly; or if there be, at what angle it could be conveniently admitted. Another consideration is the amount of space over which the light is to be distributed, and whether it can be aided by blending with the light from any other source. All these points must be considered, and the best mode adopted accordingly.

"When we wish to admit a direct light from above to two or three stories, a square opening is best; having its four sides inclined upwards to an angle of, say, thirty-five degrees; and also having the well-hole or opening in each successive floor increased at a angle of ten degrees; thus giving to the lowest story the fullest benefit of the expansion of rays.

"On each floor (except the last) the well-hole should be inclosed with framed glass sides, the wood-work of which, as well as of all the curbs and trimmings, should be painted white, and if porcelain paint, all the better; for the reflection and refraction of light thus gained is a great object.

"The spherical dome or circular forms are not well adapted for practical use, the glass being cylindrical, the light is naturally concentrated and not reflected in its course as in the former instance; besides the construction is more difficult and expensive; as each light must be curved to its required shape, and the glass necessary for this purpose is of the ordinary thickness, and liable to breakage; while the other is entirely free from such danger. When the space to be lighted is but one story, the best mode is to bring the light through one side of a raised roof, using the rough plate glass, and placing the same at a slope of about twenty degrees from the perpendicular. The hight is regulated according to circumstances; for ordinary purposes they are two feet six inches; the roof to be raised to an inclination of from ten to twelve degrees, and plastered on the under side perfectly white to the same angle with the roof, until it meets the level ceiling. The opposite side, from the glass to the ceiling, should be continued down the same slope with that of the glass, until it meets the ceiling, and the ends are usually made to this same slope, all plastered white and finished to a polished surface.

"Sky lights of this form can be placed at intervals, according to circumstances, and multiplied to any number. They are the simplest, and also the most available, when applied to a single story.

"In some cases, where it is desirable to have a superior finish to the ceiling, a sash is placed on a level with the lower surface, and glazed with embossed glass of any desired figure."

BY digesting metallic zinc in iodide of ethyl we obtain a volatile liquid which takes fire spontaneously in the air. It can be distilled in an atmosphere of hydrogen, and if this gas be made to pass through the liquid it will carry off some of the zinc-ethyl, and when ignited will burn with a magnificent white flame. It is probable that ordinary illuminating gas would answer as well as hydrogen for this experiment, The light produced in this way can be employed to take photographs, but its actinic properties are not equal to the effects produced by burning magnesium.