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Aniline Dyes.

There has been at various times much discussion on what may be termed the sanitary aspect of the aniline dyes. Although it may be at first difficult to see in what way the color of an article of costume can possible affect health, yet the relation of the one to the other is not so remote as might be anticipated. Socks, stockings, and gloves are worn next the skin, and poisonous matters may thus be brought into the system; even the very wear and tear of ordinary costume, in the event of the color not being of a very firmly adherent nature, results in a portion of coloring matter being liberated in the form of a fine dust, and thus inhaled by the lungs. In France, stringent measures have had to be adopted to prevent the artificial coloration of cheap wines with "fuchsine." Recent experiments have now beyond doubt established that aniline dyes, at least, the reds and blues, are in their pure condition comparatively inert, and that the ill effects which have been sometimes attributed to the use of these dyes are traceable, not to the pure coloring matters themselves, but to traces of arsenic which they contained, and which arose from inefficient purification subsequent to manufacture. Enterprising scientists may always be found who are willing to become martyrs, for science or for notoriety, and the present inquiry has had its self-sacrificing hero in the form of Herr Seidler, of Riga, who administered to himself three quarters of a grain of aniline red every morning, for a period of five weeks, without any ill effects. When it is pointed out that a single grain of aniline red is said to be sufficient to impart a good pink color to fifteen gallons of alcohol, it would be necessary to drink an enormous quantity of artificially colored wine in order to equal a single morning performance of Herr Seidler. So far the question is practically settled, the only remaining difficulty being our inability to ascertain whether pure or impure coloring material has been used in any purchased article; and it will therefore be better, as a simple matter of precaution, to be on our guard against the indiscriminate use of aniline dyes for coloring purposes.—*Medical Examiner.*

THE MANUFACTURE OF WALL PAPER.

The use of paper as a covering for walls originated in China. It was introduced in Europe as a substitute for tapestry hangings—whence the term paper hangings—by the French. At the present time, owing to the improvements which have been effected in printing, and the wide range of colors open to the artist designer, it offers probably the cheapest and most ornate means of mural decoration.

The blank paper is received by the manufacturer in the long rolls made by the Fourdinier machine, and weighing from 80 to 85 lbs. to the roll. It varies in quality according to the printing and finishing which it is to receive—weighing 9, 10, 12, and 14 ounces to the length of eight yards, which constitutes the usual length of the roll as sold at retail. The first process undergone is termed

"GROUNDING,"

and the object is to give the paper the requisite body to enable it to receive the colored pattern. The grounding machine is represented in Fig. 1. While passing over a roller the paper is covered with a mixture of so-called Jersey clay, which contains some 18 per cent of alumina, glue, and water, and if the surface is to be finally polished—or satin finished—a percentage of lard oil is added. Afterthe mixture is applied it is evenly distributed over the paper, first by two reciprocating brushes, then by a rotating brush roller, and lastly by two brushes like the first. It then is conducted up between endless belts across which sticks are laid, and over which sticks the paper is suspended in festoons. The sticks are so placed that a length of paper measuring just four yards hangs between any two. The belts are kept in constant motion, and the paper is thus conducted along the loft, which measures some 160 feet in length. Steam coils are placed beneath the belts, and a temperature of 120° maintained. About nine minutes are occupied by any one festoon of paper in making the journey from grounding machine to the point where it is again made into a roll, and during this period it becomes thoroughly dried. Frequently coloring matter is mixed with the ground paint, and the paper is thus given a flat tint, which forms a background for the pattern, or which is left unaltered when the paper is meant to be perfectly plain and to resemble paint or kalsomine when attached to the wall.

IMPRINTING THE PATTERN BY BLOCKS

is done in two ways, either by the block or old process, or by the roller or improved process. In either case each color entering into the design must be printed separately,

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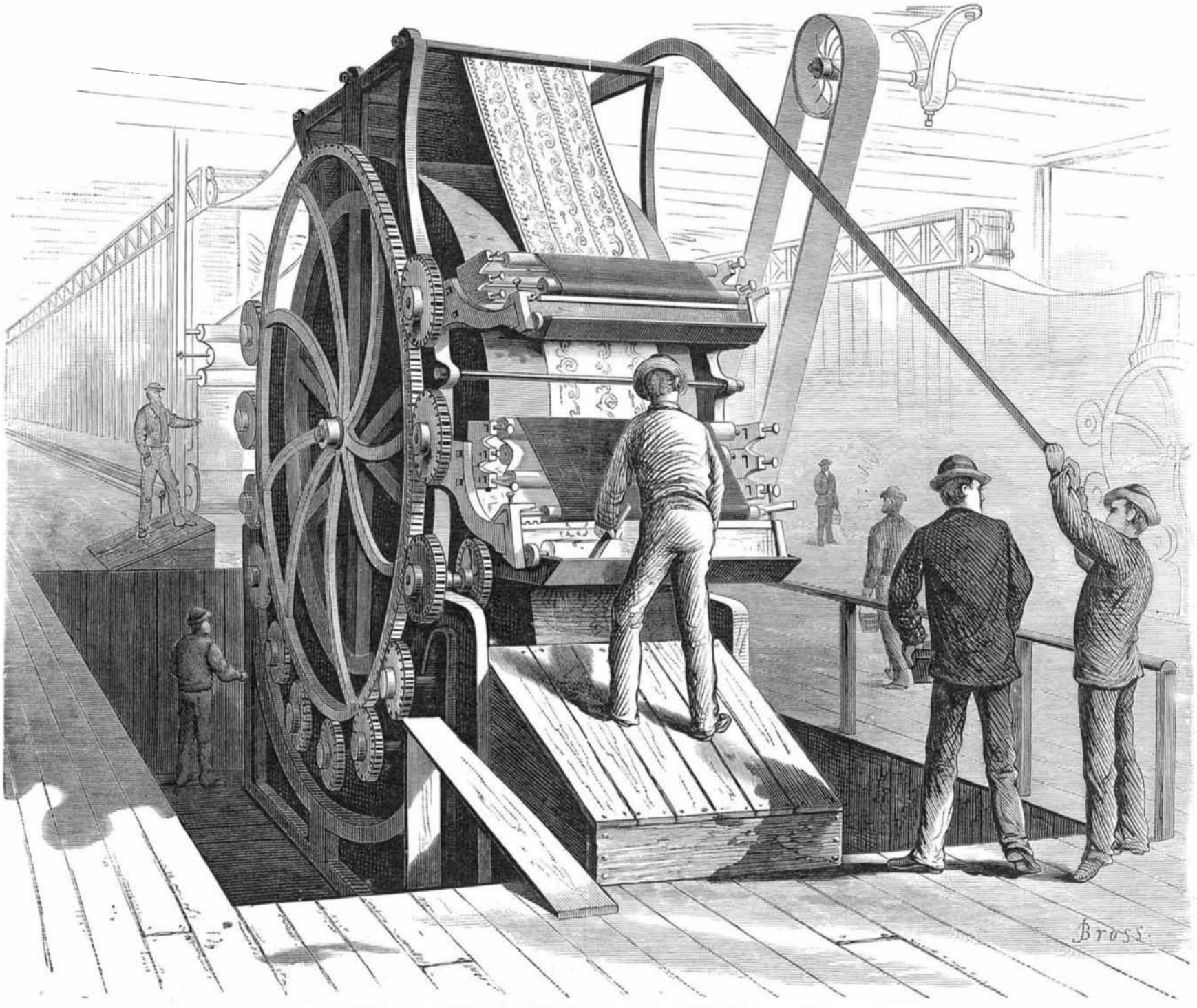


THE MANUFACTURE OF WALL PAPER.—THE PRINTING MACHINE.

[*Continued from first page.*]

so that there must necessarily be as many blocks or types prepared as there are tints in the pattern. The blocks are constructed of two layers of wood, a thin piece of maple fastened to a thicker backing of pine board. Each block is about 26 inches wide, two feet long, and an inch and a half to two inches in thickness. On the maple all of the design to be printed in a single color is drawn and afterwards cut out by engravers, so that the lines are in high relief. The more delicate figuring is not made in the wood, but is supplied by the insertion of bent pieces of brass, as we shall explain more fully in referring to the manufacture of the printing rollers further on. When the wood carving is completed, the work is brushed over with boiled oil, and when dry sent to the printer for use. The workman stands before a table, Fig. 2, over which passes the paper.

Hanging above the table, supported by an india rubber cord, is the block. The upper end of the cord is attached to a small wheel traveling on an iron guide, so that the block may be swung from the table over to the place where it receives its covering of color. This last is obtained from what is termed the "slush box," which consists of a shallow box, the bottom of which is covered with painted ticking. This box floats on a mixture of water and paper pulp contained in a larger box, so that its bottom is always perfectly level. The workman first places the paper across his table, then swings the block over to the slush box and brings its carved side down on the paint. Next, he carries the block back again and places it on the paper, of course using great care in the registering, so that the impression may fall exactly on the right place. A vertical movable arm attached to a frame above is now rested upon the back of the block, and forced down by a lever worked by the foot of the operator. This process is repeated until the whole piece is covered with the pattern, when it is hung up until perfectly dry.

Hand printing is now used on borders where there are many colors, and in the finer qualities of decorated paper, where the care requisite for printing the numerous tints can scarcely be exercised during the motion of the rapid working cylinder machines. In

ROLLER PRINTING

the impression is obtained from a series of rollers, on the surface of which the design is raised. This process is used for all the cheaper grades, and hence for very much the greater proportion of all the wall paper manufactured. The rollers are of maple lined interiorly with brass. Four different sizes are used, measuring respectively 13, 16, 18½, and 22 inches in circumference. Their width in all cases is 18½ inches. The pattern of the design is first drawn on paper and colored, and then the outlines of the various parts are transferred upon the rollers, each roller printing, as before stated,

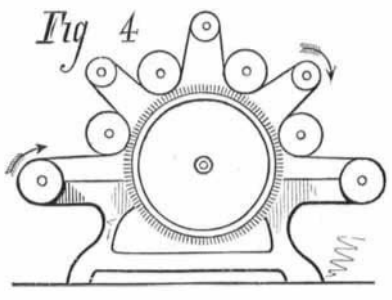
GROUNDING MACHINE.

only such portions as are of one particular hue. Unlike that of the blocks described above, the surface of the roller is not engraved away, but the pattern is made by driving in pieces of thin brass, which the workman, Fig. 3, bends in a vise so as to correspond with the lines of the pattern. Where there is a considerable area to be printed "solid," its outlines are raised in brass, and inside the metal boundaries thus made is packed glued felt. In some cases where the paper is not grounded rollers are covered entirely with felt with the exception of such portions representing the pattern as are intended to be left white. After the design is thus produced the roller is placed in a lathe, fixed in the slide rest of which is a vertical file which smooths the surface, or if the roller be entirely felted it is submitted, when the glue in the felt is dry, to the action of an emery wheel.

The printing machine consists of a large cylinder or drum around which the paper passes. While being thus carried the paper receives an impression from each roller in turn, the rollers being disposed around the periphery of the cylinder. Each roller is supplied with color by an endless belt of felt, which passes down into a receptacle filled with the paint. If the paper is striped the colors are blended by dry paint brushes held in contact with the surface as the cylinder rotates. In the large illustration on the first page a 12 roller machine is represented. This prints therefore twelve colors at once.

HAND PRINTING.

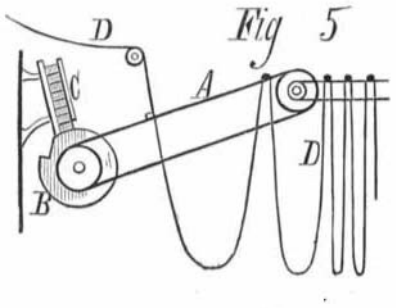
If, however, the paper is to be satin finished, before the above operation takes place it is put through a polishing machine shown in section in Fig. 4. This consists of a central rotating brush against which the paper is carried by several metal cylinders. The alumina and oil in the groundwork admit of its being finely polished. The printed pattern is, however, in dead color, so that when the paper is finished some portions have a luster while others do not, thus adding to the detail of the ornamentation.



POLISHING MACHINE.

As the printed sheet emerges from the machine, it is led over sticks on endless belts the same as before described during the grounding process. An ingenious device is employed for placing the sticks under the paper, which is represented in Fig. 5. At the ends of the roller over which the endless belt, A, passes, are two cams, one of which is shown at B. Above the cams and resting on their periphery is a pile of sticks, C. The cam shoulder equals in height the thickness of one stick. Hence at each revolution of the cam a stick is moved from the bottom of the pile and carried down on and across the belts. Between the latter comes the paper, D, which thus falls in folds over the sticks as they are laid in place.

After the paper has been carried on the belts to the end of



the loft (becoming dried meanwhile) its end is connected to a swiftly rotating horizontal spindle which winds it into tight rolls. These measure but 8 yards in length, the sheet being cut by the attendant as soon as a mark placed by the printing machine comes to the spindle. If the paper is to be embossed this is now done by passing it between engraved metal rollers. Nothing further then remains but to send it to the markets.

THE COLORING MATERIAL

is made of ordinary dry pigments combined with the Jersey clay and gum substitute. This last is produced from potatoes, large quantities of which are raised for this especial purpose. The tubers are simply dried and ground, the powder forming when mixed with water an extremely adhesive size. Sometimes ordinary glue size is employed. Paris green and the arsenical colors are now rapidly going out of use in paper coloring, chrome green being utilized in preference to the former.

We have obtained the material for this article and the annexed engravings from Messrs. Christy, Shepherd & Garrett the proprietors of one of the largest wall paper factories in the country. The establishment is located at No. 510 West 23d street in this city; 125 workmen and 13 large printing machines are here employed, producing six million rolls of paper per year.

MAKING PRINTING ROLLERS.

How to Detect a Ripe Watermelon.

Few people know, from an outside inspection, how to determine the ripeness and the perfection of a watermelon. Inquiries are frequently made in the horticultural journals as to the means to be used to arrive at a reliable rule for settling this question. Within a few days, says a correspondent of the *Country Gentleman*, I have seen directions given to reach a correct conclusion on the subject, by pressing the melon and noting the manner in which it emits a crackling sound under the operation. These results are to be obtained after some experience in judging of its peculiarity under pressure. Considering the vast quantities of this delicious fruit consumed at the north, after shipment from the sections where the vine flourishes, but where the fruit is always picked in an immature state in order to bear transportation well, it is really a serious matter to be able to know certainly when buying a melon, perchance on the street or at a dealer's stand, whether one is securing a ripe melon or not. In nine cases out of ten the chance is that your melon is only half ripe, and therefore not a great acquisition for your dessert.

Now let me give you and your readers an infallible sign by which to know a fully ripened melon. When the melon begins to change color inside, and its seeds to turn black, a small black speck, scale, or blister begins to appear on the outer cuticle or rind. These are multiplied and enlarged as the fruit matures. A ripe melon will show them thickly sown over the surface. A partial development only indicates half ripened fruit. A full crop of blisters reveals its perfect ripeness. When hundreds of melons are strewn along the sidewalk, you will have to look pretty sharply to find one that exhibits a satisfactory "escutcheon," to borrow a term from M. Guenon. But it is unfailing when found, and by following this guide you may walk away with your melon with the most entire confidence. The blister is only to be seen upon a close inspection, but is plainly visible when that is given.

How to Attach Photographs to Glass.

W. T. Watson, of Harriston, Cadada, gives the following method to fasten photographs on glass without leaving air bubbles, and also how to make them transparent: Allow the photograph to remain in water until thoroughly soaked, then place between blotting paper. It should remain until it is just damp enough to be pliable. Then coat the face of the picture with good paste made from flour or starch, and lay face on the glass. Commence in the center of the pic-

ture and rub outwards toward the edges to dispel all air and paste. Be very careful not to get paste on the back of the print. Keep it damp with a sponge until the rubbing is finished, being careful not to break the surface of the paper. When perfectly dry, lay on a heavy coat of castor oil and it will soon become transparent. If too much oil, rub off the surplus with a cloth. Allow it to stand a day or two, when it may be colored.

IMPROVED APPARATUS FOR TESTING BANK CHECKS.

The device herewith illustrated is intended as a safeguard for bank checks, which will enable any alteration or raising of the figures of the same to be at once discovered. Certain perforations are made in the paper which, by their position, indicate the true amount, but it is impossible for any one to make these perforations at the right places, unless he possesses the depositor's peculiar combination, while the presence of a perforation in the wrong place immediately discredits the check.

The invention includes two separate devices—one to be in the possession of each depositor, the other to be kept by the bank. The first is represented in Fig. 2, the second in Fig. 1. Both have metal base plates, A, to which are hinged other plates, B. The plate, B, in Fig. 2, has inscribed upon it just seven concentric polygons, which are intersected by thirty-one radial lines. At each of the points of intersection (except at those on the innermost polygon, where they are spaced further apart) apertures are made. The radial lines are numbered as shown at their outer ends. These numbers are called combination numbers. The apparatus used by the bank is represented in Fig. 1. In the outer plate, B, is a circular hole around which numbers are marked. Within the circle is placed a loose polygonal plate, C, marked off and perforated in precisely the same way as the outer plate of the depositor's apparatus. This plate is held in position by lugs, D, and is provided with a handle or extension piece. E.

The mode of using the device is as follows: On the depositor's portion, Fig. 2, is inscribed the number 68. This gives 18 as the index number of that particular apparatus, 50 being taken as the starting point. We will suppose that the index being 18, the depositor's combination number is 22, and the amount of his check $1,225. After filling out the check, he places it on his plate, A, beneath the plate, B, Fig. 2. A pin at F, in the lower plate, then perforates the check, and enters a hole in the upper plate. Beginning with the units of the sum to be marked 5, is added to the combination number. The total of 27 is now found on the edge of the polygon, and through the hole in the outside polygonal line opposite that number a hole is pierced by the pin shown at G. The figure in the ten's place or 2 is next added to the combination number, and the pin is forced through the hole in the second polygonal line opposite the number 24, and so on, the hundreds being marked through the third polygonal line, the thousands through the fourth, and so on to the tens of thousands. The hundreds of thousands and the millions are marked in the two inner polygonal lines

When a check is received at the bank the index and combination numbers of the depositor are noted. The plate, C, is then adjusted to bring the zero point opposite the depositor's index number on the surrounding circle, the handle, E, furnishing a convenient means of doing this. The check is then placed so that the pin, G, on the plate B, Fig. 1, corresponding in position to the similar pin in Fig. 2, enters the hole in the check made by the latter. The perforating pin, F, is then used in the same manner as already described. The check in being removed from the apparatus is examined, and if no new punctures have been made it is genuine; but if new holes have been formed, then there is proof of the raising or forging of the check.

Patented through the Scientific American Patent Agency August 21, 1877. For further particulars address F. and A. D. Grafelmann, Middle Village, Queens county, L. I.

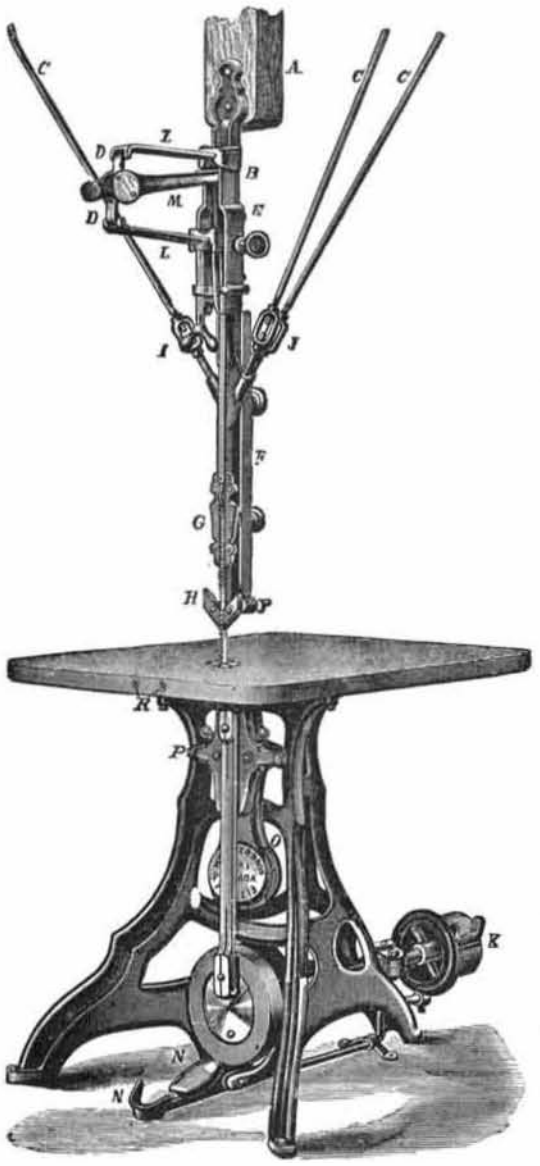
American Machinery in New South Wales.

Messrs. J. A. Fay & Co., the well known manufacturers of woodworking machinery, of Cincinnati, Ohio, inform us that the Metropolitan Exhibition of New South Wales, to which they contributed quite largely, proved remarkably profitable and satisfactory to them. They received four medals in competition with other American and the English manufacturers. We have taken occasion before this to direct the attention of our readers to the extensive demand for improved American machinery in Australia, and Messrs. Fay & Co.'s statement goes further to show the ready appreciation which our industrial products there encounter.

CEMENT UPON IRON OR STONE.—A cement made of glycerin and litharge hardens rapidly, and makes a durable cement upon iron or stone. It is insoluble and is not attacked by acids.

WALKER BROTHERS' IMPROVED SCROLL SAW.

Workers in wood are generally aware that while the band saw is excellently suited for outside work, it is not so for inside cutting or perforated work. The jig saw, on the other



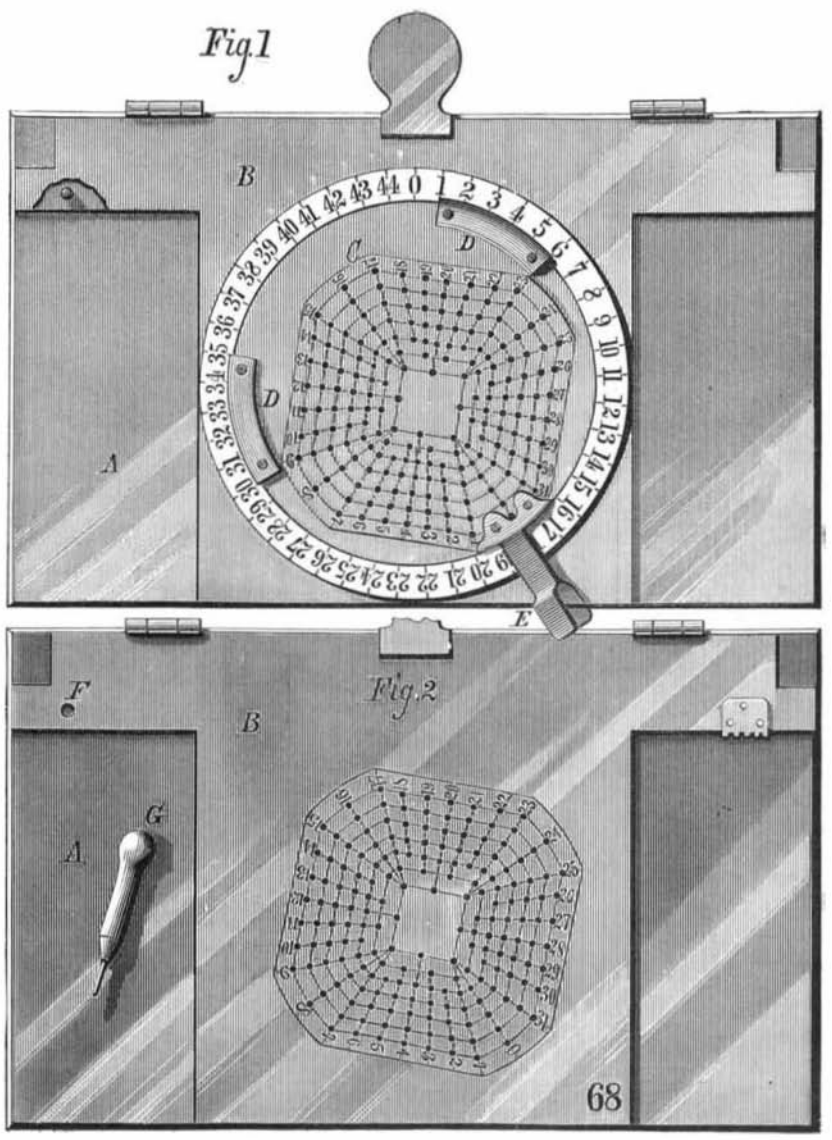
hand, is adapted to both, and for the latter variety especially, owing to the facility with which its blade can be detached or unhooked and passed through the holes made in the piece to be sawed. On its capabilities in this particular are based the claims of superior economy usually advanced for the jig or scroll saw

A new machine of this description is represented in the accompanying illustration. It is designed for general use on medium or fine work in hard or soft wood. It is durably constructed, and is provided with convenient means for the adjustment of all its parts.

As the straining device for the blade is one of the most important features in the construction of the scroll saw, special attention may be directed to the ingenious arrangement herein embodied. The object is to produce an even tension on the blade at all points of the stroke, and to enable the strain to be varied at pleasure. Springs, L, links, D, and lever, M, are attached to a casting that may be moved up or down the standard, B, for blades of different lengths. More or less strain may be imparted by turning the hand nut, I, so moving the lower spring, L. As the lever, M, travels on its upward or downward stroke, it throws the supports of the limbs, D D, forward and backward; in this way the lever tension of the blade is maintained. The links, D, are attached to the ends of the springs and lever so as to roll on their points of contact or bearing surfaces, thus reducing friction of the working parts. The upper and lower fastenings for the saw blade are made to fit any thickness, and the blade can be quickly changed for perforated work without raising and lowering the upper slides or hold down, F. The lower slides, P, have a parallel adjustment, and are set up for wear by simply turning one screw, P, at the sides of each slide.

A small rotary blower, O, attached to the frame under the table and driven by a pulley on the balance wheel shaft, forces a blast of air against the sawdust as it comes from the blade, keeping the slides free from dust, preventing absorption of the oil in the lower slide and guides, and preventing the noise and heat so common in slides when running loose and dry. A rubber tube, not shown in the engraving, is attached to the blower and conducts the air above, keeping the sawdust from the working lines of the sawyer.

The table is made of wood or iron, as preferred, and the filling around the saw blade may be of wood or of hardened steel. The latter is kept in place and adjusted by the screws, R, in front of the table. The hold down, F, and the slides, G, may be adjusted independent of each other for thickness of stuff or length of blade, and the back and side guide, H, removed, when not in use, for long or narrow blades. The lower slides, P, may also be set up for wear and kept parallel without trouble and loss of time. The saw is started and stopped by the foot of the operator on the rod and brake, N, and the belt shifter, K—another important improvement—may be set for the belt in any direction. All the parts are well made and fitted, and guaranteed in every respect. The pulleys are 6 inches diameter by 3 inches face, and should make from 900 to 1,050 revolutions per minute. Patented May 27, 1873. For further information address the manufacturers, Messrs. Walker Bros., 73 and 75 Laurel street, Philadelphia, Pa.



APPARATUS FOR TESTING BANK CHECKS.

Egg Raising.

The egg traffic of this country has risen to an importance which few comprehend. The aggregate transactions in New York city alone must amount to fully $8,000,000 per annum, and in the United States to $18,000,000. A single firm in that line of business east handled $1,000,000 worth of eggs during the year. In Cincinnati, too, the traffic must be proportionally large. In truth, the great gallinaceous tribe of our country barnyard contributes in no small degree to human subsistence, eggs being rich in nutritive properties, equal to one half their entire weight. Goose, duck, hen, pullet, and partridge eggs are the principal kinds produced in America. We have nothing, however, like what we are told used to be found in Madagascar, or have been found there, the gigantic woa egg, measuring thirteen and a half inches in extreme length, and holding eight and a half quarts. One of these birds, with a single effort, might supply a modern boarding house with omelettes for a day.

The perishable nature of eggs has naturally detracted from their value as a standard article of diet. The peculiar excellence of eggs depends upon their freshness. But lately the process of crystalizing has been resorted to, and by this process the natural egg is converted into a vitreous substance of a delicate amber tint, in which form it is reduced seven eighths in bulk compared with barreled eggs, and retains its properties for years unimpaired in any climate. This is indeed an achievement of science and mechanical ingenuity, and has a most important bearing on the question of cheaper food, by preventing waste, equalizing prices throughout the year, and regulating consumption. In this form eggs may be transported without injury, either to the equator or the poles, and at any time can be restored to their original condition simply by adding the water which has been artificially taken away. The chief egg-desiccating companies are in St. Louis and New York. No salts or other extraneous matters are introduced in the process of crystalizing, the product being simply a consolidated mix-