3 Sheets—Sheet 1.

W. BREWER & J. SMITH.

PAPER MOLD.

No. 7,959. Patented Mar. 4, 1851.

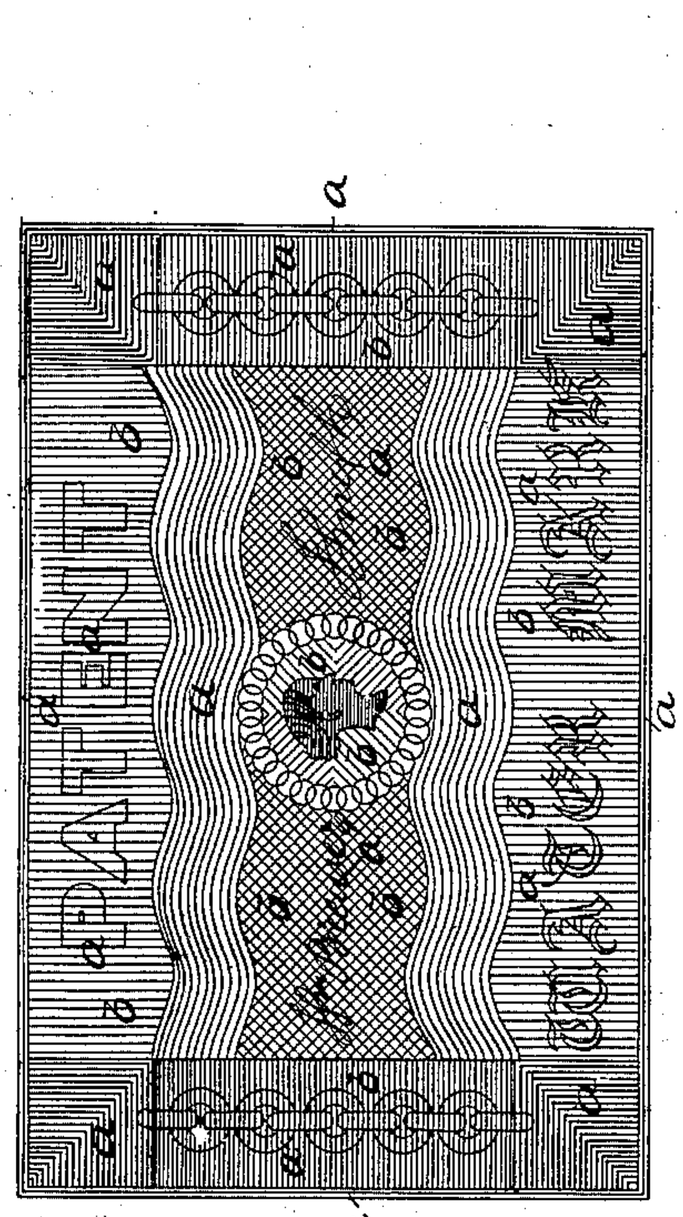


Fig. 7.

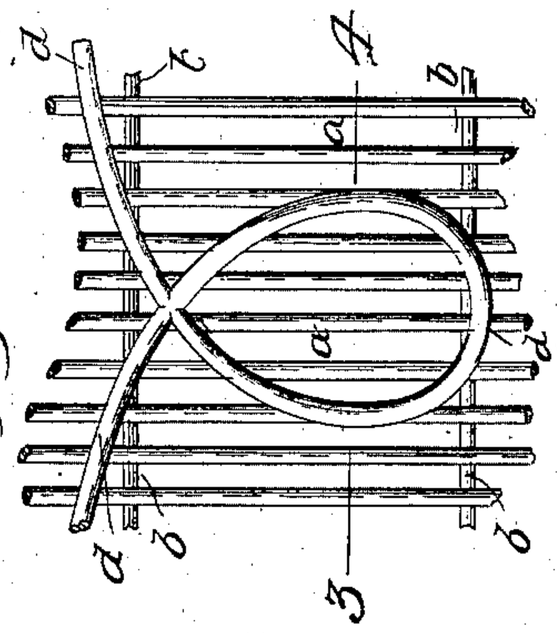


Fig. 16.

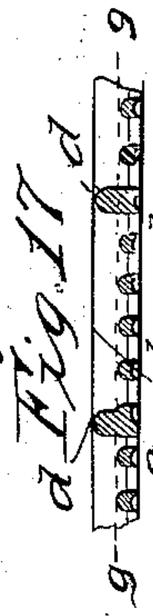


Fig. 17.

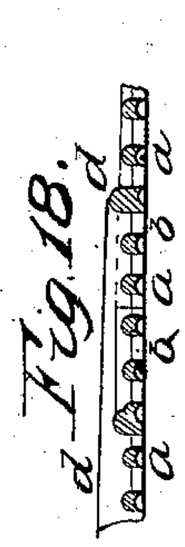


Fig. 18.

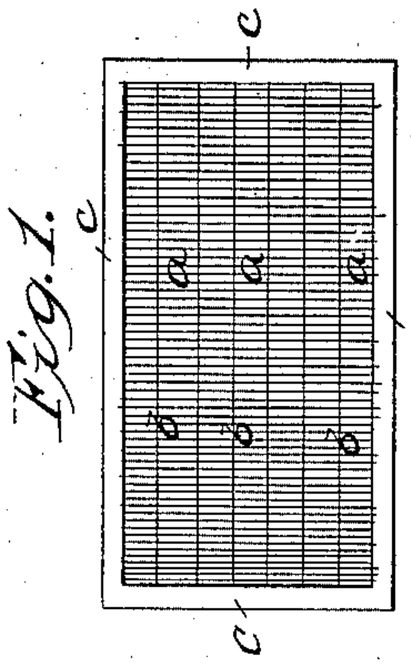


Fig. 1.

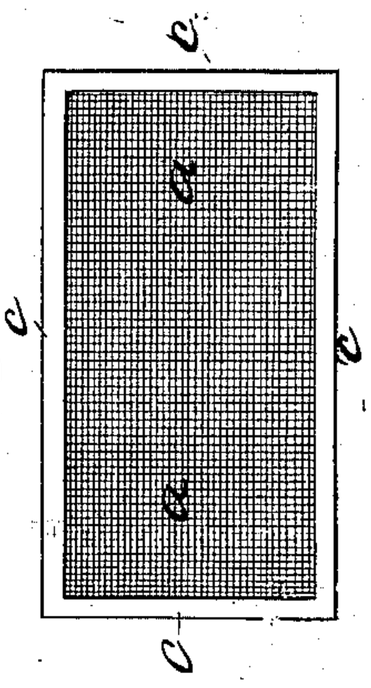


Fig. 2.

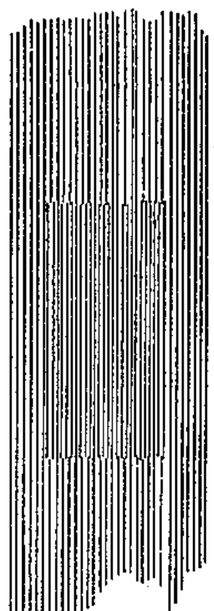


Fig. 19.

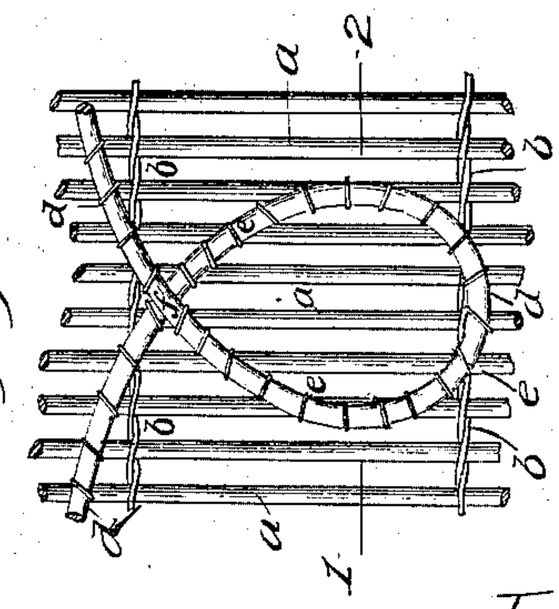


Fig. 3.

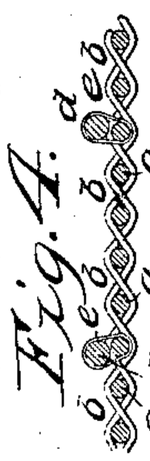


Fig. 4.

Fig. 15.

Witnesses:

Joseph Draycott

William Young

Inventors

William Brewer

John Smith

3 Sheets--Sheet 2

W. BREWER & J. SMITH.

PAPER MOLD.

No. 7,959. Patented Mar. 4, 1851.

Fig. 5.

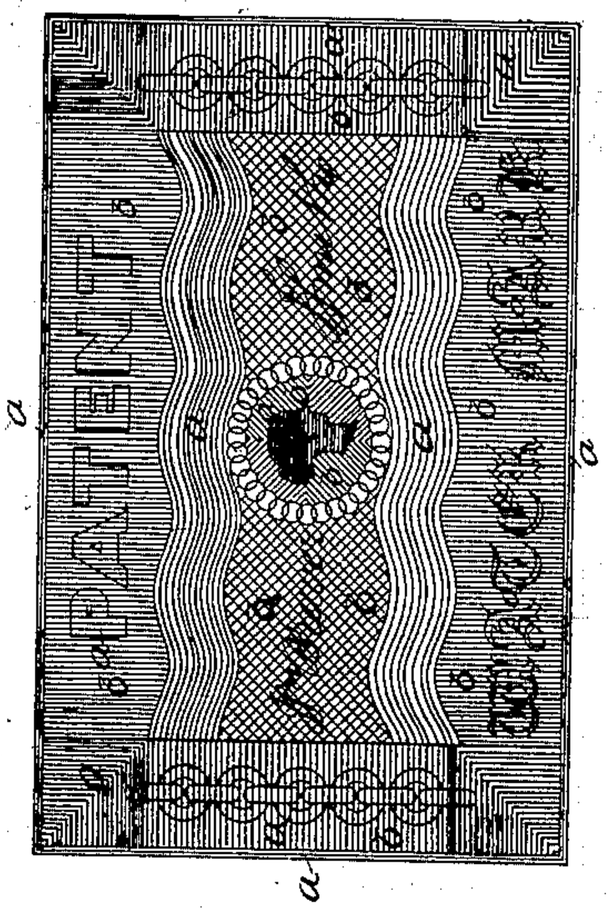


Fig. 6.

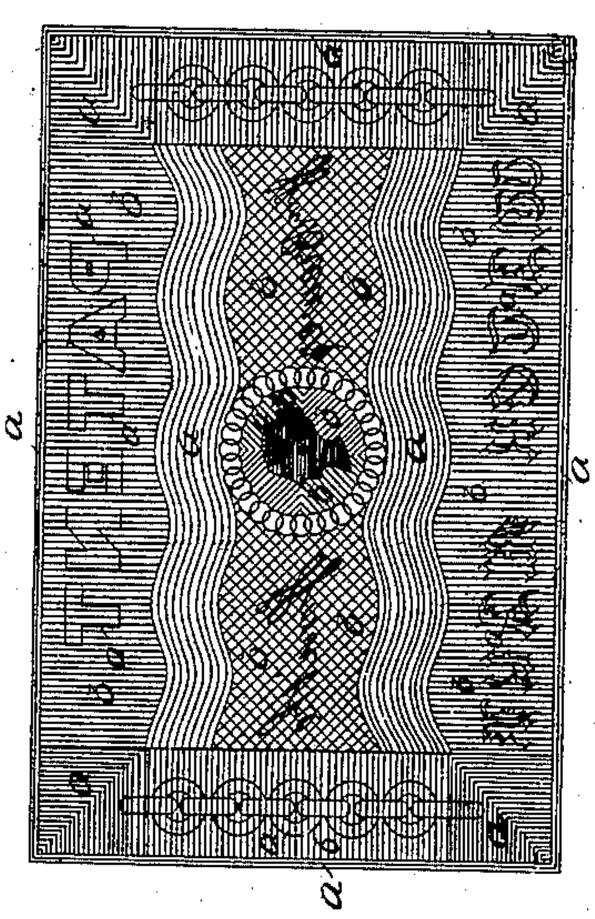
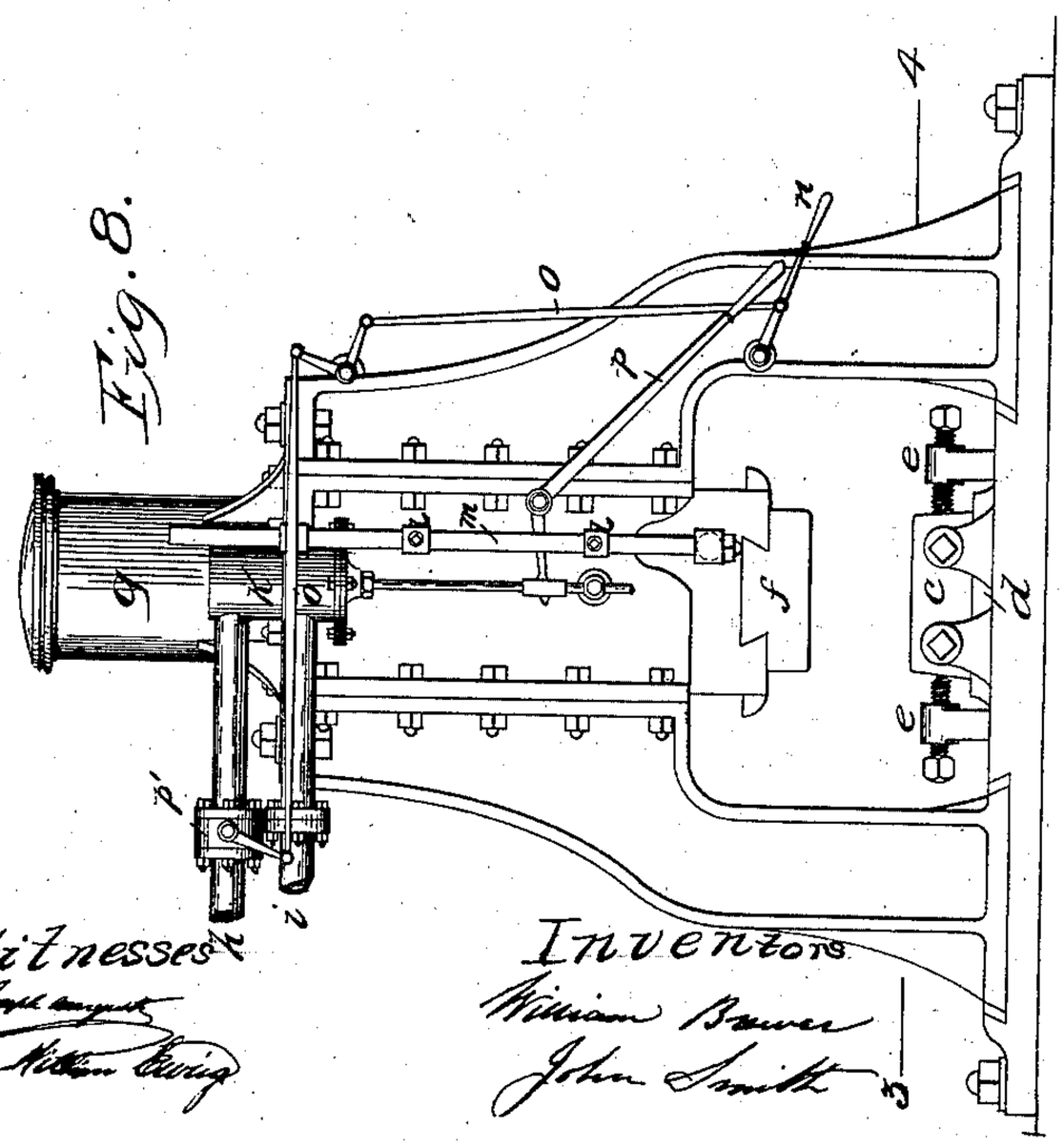


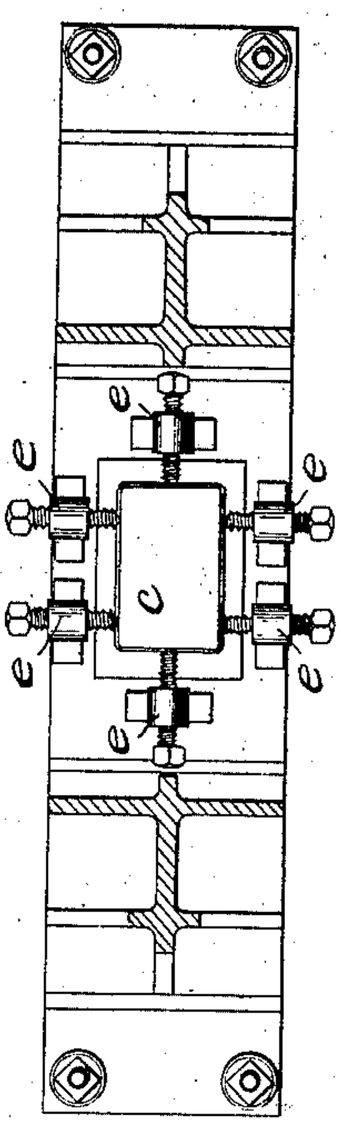
Fig. 8.



Witnesses:
Joseph Wright
William Berry

Inventors:
William Brewer
John Smith

Fig. 9.



3 Sheets—Sheet 3.

W. BREWER & J. SMITH.

PAPER MOLD.

No. 7,959 Patented Mar. 4, 1851.

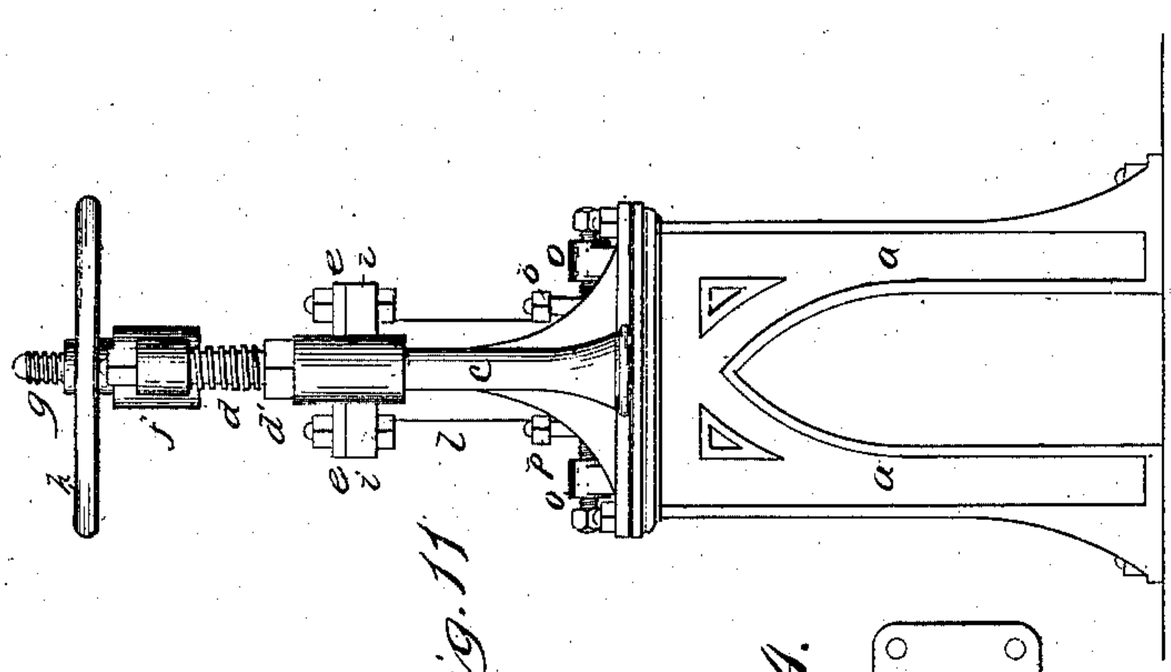


Fig. 10.

Fig. 11.

Fig. 14.

Fig. 13.

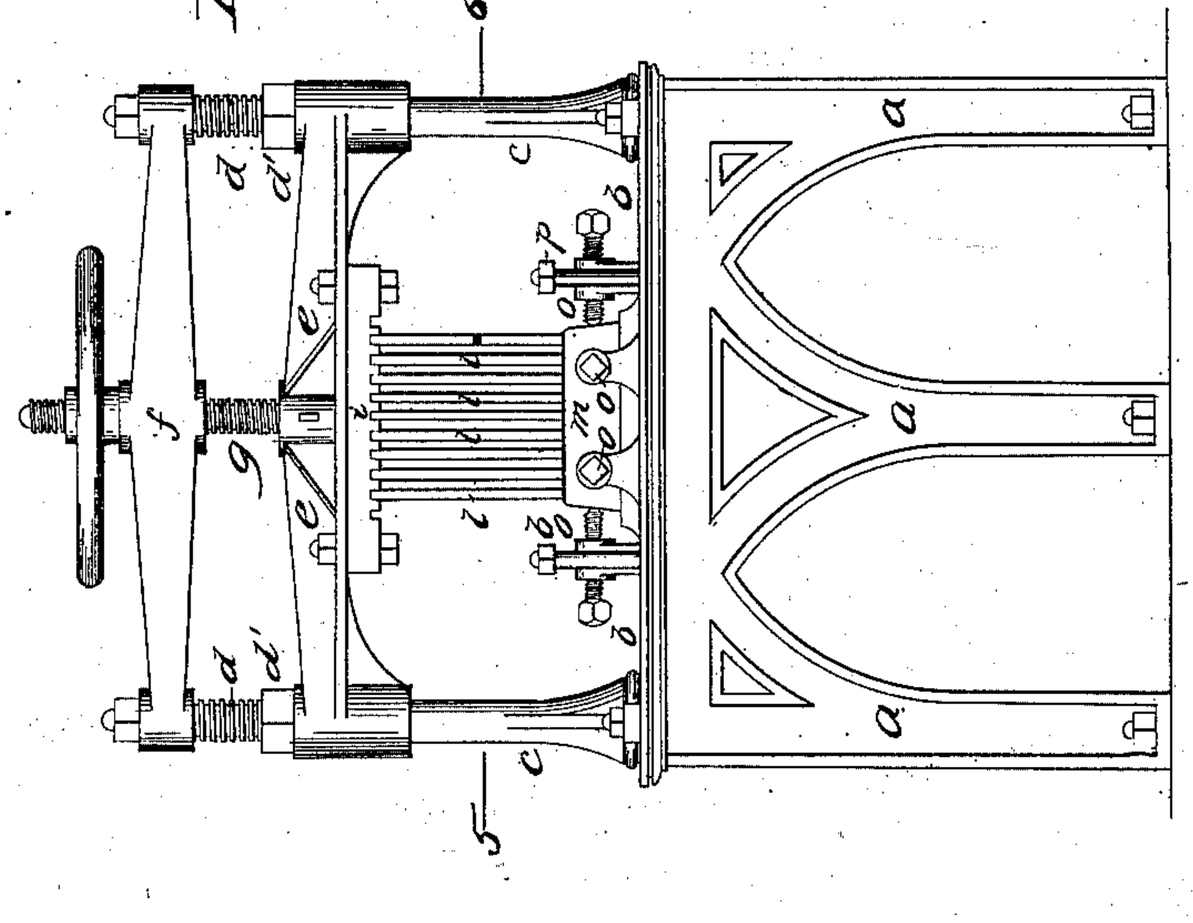


Fig. 12.

Witnesses:

Joseph Bonaparte

William Ellery

Inventors

William Brewer

John Smith

UNITED STATES PATENT OFFICE.

WILLIAM BREWER, OF CLAPHAM, AND JOHN SMITH, OF SOUTH LAMBETH, ENGLAND.

PAPER-MOLD.

Specification of Letters Patent No. 7,959, dated March 4, 1851.

To all whom it may concern:

Be it known that we, WILLIAM BREWER, of Malcolm Place, Clapham, in the county of Surrey, and JOHN SMITH, of Southville, South Lambeth, in the county of Surrey, England, manufacturers, have invented certain Improvements in Molds for the Manufacture of Paper and Cardboard and Producing Water-Marks therein.

Our invention has for its object the manufacture of paper and card board with a water mark exhibiting an uniformity and peculiarity of design not attainable in the process of manufacture as hitherto conducted.

Designs, figures, or devices, commonly called water marks, are of various descriptions, and well known; but designs, figures, or devices, as water marks, of the kind which we can produce, have been hitherto unattainable with molds or apparatus of the ordinary construction; and our invention consists in a new or improved mold, for the manufacture of paper or for the purpose of producing better water marks therein, than has been effected by molds as ordinarily constructed.

In the process of paper making by hand, apparatus or machinery technically called a "paper mold" is employed, upon which the pulp forming the sheet of paper is placed. This mold consists of a frame of the shape of, and nearly corresponding to, the sheet of paper required to be produced. Between the sides of the frame are placed, or stretched, wires and it is upon these wires, that the pulp is placed when a sheet of paper is to be made; the superfluous water in the pulp draining off between the wires. The size of the sheet, is determined by a shifting frame, or "deckle" put round the edges of the frame before mentioned, which forms the edges of the sheet. The "deckle" is sometimes made in compartments, this subdividing the full sheet upon the face of the mold. Two descriptions of wire work are employed in the molds, one of which is called "laid wire", the other "woven wire."

A "laid" wire mold is illustrated in Figure 1 Sheet A, the wires *a*, *a*, are placed parallel, their ends and seams being secured to the frame *c*, *c*, the interval of space between them, being usually about equal to the thickness of the wire employed. These parallel wires are connected together by means of the seams *b*, *b*, which are other and finer wires interlacing the several parallel wires transversely, likewise at intervals; this is called a "laid wire mold". Fig. 2, represents a "wove" wire mold, the wire surface *a*, *a*, is secured to the frame *c*, *c*, as before, but in this case it is composed of ordinary woven wire cloth, this is a "wove wire mold". The paper made from these two molds will present no water marks properly so called, although the wires forming them produce slight marks in it, those in the paper made from the laid wire, being somewhat more distinct, than those visible in the paper from the wove wire mold.

When it is required to produce a water mark in the paper manufactured, the design required to be produced is formed upon the upper surface of the "laid", or "wove" wire mold, by means of one, or more, pieces of cylindrical wire being curved, bent, or formed, into the shape necessary to form the design; and which is then laid upon the wire work of the mold, and stitched thereto with a finer description of wire. The stitches of finer wire passing over some portions of the design, and under some portions of the wire work of the mold; and thus the design is attached to the mold. Fig. 3, shows a portion of a laid wire mold and Fig. 4 a section of ditto through the line 1—2 having the design upon it for producing the water mark in the paper. This figure shows the old method adopted for making and forming the mold and design, and is drawn to a scale considerably above its real or full size for the purpose of rendering it more distinct, *a a* being the parallel laid wires *b b* the seams which are twisted so as to connect together the parallel laid wires *a a*. The design *d*, which of course may be of any device other than that here shown, which is merely an example, is formed of cylindrical wire into the shape required, and is then attached to the laid wires *a*, *a*, by means of the stitches *e*, *e*, of finer wire, which passes over the wire forming the design and under some of the laid wires. In some designs the wire forming them will not unfrequently be found to cross each other, this is exemplified in the example Fig. 3 at *f*, the

consequence is that at these points the device or design will project a greater distance from the laid wire surface than the other portions of it, thus producing an irregularity in the water mark detrimental to its uniformity. When it is required to produce a water mark in the paper, portions of which shall vary in its shade, or in other words of greater or less intensity, the mold is formed, as to such parts, of wires of varying thicknesses or diameters; thus, for producing a deeper or more distinct mark, a thicker wire is employed, and for a finer or less distinct mark a finer wire is used; but it must be observed that the transitions from one depth or shade of water mark to another by this mode of forming must be sudden, in consequence of the wires employed being cylindrical. The disadvantages attending the above described which is the ordinary method of forming and constructing the molds are numerous we will state a few of the most important of them.

As all the wires forming the letters, figures or other devices, which constitute the designs upon the mold, have to be formed by hand it is impossible in the first instance to shape them with sufficient precision, and in the second place, to place and attach them upon the "laid" or "wove" wire so as to retain the form previously given to them. The consequence is that two molds made by the same workman will differ in several particulars. The only guide which the workman has to govern the forming of the designs, being a rough outline, other differences must exist. Hence it follows that the water marks produced in paper manufactured by different molds, cannot possibly be identical although they are intended to be so. This mode of attaching the wires, forming the device or design to the laid or wove wire by means of stitching or interlacing with smaller wires, does not secure the permanent maintenance of the first form of the design; as the stitching does not sufficiently retain the design in its place, to prevent its being displaced by working or other causes, and the shifting of any portion of the design necessarily produces a corresponding variation in the water mark. And again the stitching is extremely liable to become loose or fractured, (and this is continually taking place) and as a consequence, a portion at least of the design shifts, and its shape or contour becomes changed, entailing a corresponding change in the water mark produced. The fracture or breaking up of the stitching wires, is very much facilitated by the action upon the metal composing them, of the chemicals contained in the pulp from which the paper is manufactured, which corrode and destroy them very rapidly. These causes render frequent reparation to the molds necessary, and such reparations very frequently have also the effect of permanently altering and changing the design from its original shape. Another disadvantage attending the employment of the stitching wire to connect the design to the laying, is the streaked or clouded appearance given to the water mark produced in the paper, by reason of such stitches projecting a little above the surfaces of the wires composing the design itself, as those stitches are not placed sufficiently close to form an even surface, and the accumulation of these stitches produced by the repairs increase this evil from the great number of angles presented in the molds by the junction of the wires. From the action of the acids and chemicals contained in the pulp corrosion of the mold takes place and it gets clogged to a considerable extent. The usual remedy adopted in this case is to dip the mold into water after a few sheets have been made from it. By this means the acid is partially washed off the mold but this entails a considerable loss of time, and only partially lessens the effect, as corrosion still takes place rapidly, the clogged state of the mold continues to increase, and the paper manufactured by it is produced with a spotted or shaded appearance.

Having made a few remarks upon the ordinary method of making the wire molds employed in the manufacture of paper and the disadvantages attendant on the manufacture of the paper therefrom, we will now proceed to describe our improvement. An improvement effected by us in the manufacture of paper and card board, consists in producing designs or devices as water marks which have hitherto been unattainable, and this by the employment of our improved molds in the manufacture of the paper, as they are made and constructed according to the manner hereinafter to be described.

The water marks we produce in paper are in the first place, free from that cloudy and irregular appearance, observable in the water marks produced in the paper, when it is made in molds of the old construction; there being in our improved molds no stitching or other similar fastening wires for attaching the design to the laid surfaces; there being also fewer irregularities and fewer angles at the junctions of the wires. The molds even if placed under the same circumstances as the old molds will not become corroded and clogged to nearly so great an extent, and thus the paper produced from them will present water marks more clear and distinct that the old molds; and the general surface of the paper itself will be greatly improved and present less of spots or shades. The mode adopted of cleaning

the old molds from corrosion and clogging, viz, by simply dipping them into water occasionally effects that object very imperfectly, and the fragile and loose construction of the mold precludes more effectual means of cleansing being adopted; while from the peculiar construction of our improved molds we are enabled to adopt more effectual means of cleansing them, and thus always preserve them in a state fit to produce a superior description of work. For instance we are enabled to apply a brush to them for this purpose, which applied to the old molds would be destructive or injurious to them, by breaking up the fine stitching wires and seams. Our improved molds may also be cleansed by dipping them into diluted acid, which would, if applied to the old molds, speedily corrode and destroy the fine stitching wires and seams.

The absence of stitching wires and seams on the surface of our improved molds also presents less obstruction to the escape of the water from the pulp when placed upon the mold. The superfluous water drains away with greater facility and the quality of the paper manufactured is considerably improved, it being more regular and even in its texture, less spotted or shady in its appearance, is manufactured with greater facility, and less waste paper is made. We are also enabled by the employment of our improved molds to produce water marks in paper which shall be of various depth or shades gradually increasing or decreasing in their intensity. This effect has hitherto been unattainable by molds made according to the old method by reason of their being constructed of cylindrical wires, which though sometimes employed of different diameters in the same design (thereby producing a difference of intensity or shade in the water mark,) still the transition from the one to the other is sudden and not gradual. Independent of the water marks properly so called produced in the paper by the design or device upon the mold for that purpose, other and lighter marks are produced by the seams which interlace the laying. By the employment of our improved molds for making the paper we entirely remove all seams employed in forming the laying itself, the seams or the parts corresponding to them which we employ in the laid surface as indeed in the whole construction of the mold, being so placed as to be below the under surface of the pulp when it is upon the mold, and therefore not touching the pulp no marks are produced in the paper (as there is when the Old Laid Molds are employed,) by the wires forming the seams projecting upward above the laid wires and consequently into the pulp. We are also enabled by our method of making and constructing our improved molds for manufacturing paper and which method will hereinafter be fully described and ascertained, to produce sheets or pieces of paper bearing designs or devices thereon as water marks to any extent of repetition required and all such designs or devices of water marks shall be identical. Thus we effect by producing any number of the molds required all of which shall likewise be identical, and which effect it is an impossibility to accomplish by the old method of forming the molds where the only guide or security to accuracy and identity is the deviating eye and hand of the workmen employed. The importance in this respect of providing a security against fraud and forgery is so immense and generally acknowledged to be a great desideratum, that it may be necessary for us to state some of the purposes to which our improvement is applicable for effecting that security to a very considerable extent, as the most elaborate designs of water mark can be produced with equal accuracy and facility as the more simple ones; facsimiles of autographs, and signatures of individuals, fixing the seals or devices of public companies and such like designs hitherto perfectly unattainable in paper manufactured by the old descriptions of molds. Amongst the principal purposes to which our invention is applicable may be named bank notes, treasury notes, exchequer bills, and other government papers, customs warrants, postage stamps, post office money orders, forms of wills, ecclesiastical papers, law records, government securities, stock receipts, bonds, dividend warrants, checks, railway scrip, journals and books for important entries, transfer books, promissory notes, bills of exchange, certificates of marriages, births and deaths, registration papers and other or any papers requiring security.

Such being the nature of our improvements in the manufacture of paper and card board we will now describe the method or methods of making or constructing the molds and designs to be employed Fig. 7, Sheet A, represents a sheet of paper intended to be used as a bank note or other purpose requiring a water mark of secure design. The size of the mold usually employed in the manufacture of paper is of sufficient extent to allow four of these notes to be made at one time, the full sheet being divided by the "deckle" across the center of the frame; the surface of the mold frame is divided into four equal parts, in each of which is placed a mold plate capable of producing the particular mark required. These designs are perfectly identical and therefore the sheet of paper when made, being cut or divided, into two portions presents 4 notes or pieces of paper, having

water marks identically the same. It will be perceived that the whole surface of the sheet represented in Fig. 7, is covered with the design and therefore the corresponding water marks occupy the whole surface of the sheet. The construction of these molds is as follows: The design having been decided upon as for example as shown in Fig. 7, it is cut and engraved upon the surface of a steel die in the ordinary manner, care being taken in cutting the die that the parts of the design which are to be darkest in the water mark are to be cut deepest upon the die; also that the parts of the design which are to be lightest in the water mark or nearest to the general substance of the paper are to be cut to the least depths upon the die. The face of the die is shown in Fig. 5. Fig. 6 represents the face of the mold produced from the die as hereinafter mentioned and Fig. 7, the appearance of the paper manufactured from a mold so produced; the darkest lines in Fig. 7, as for instance the outlines of the letters in the word "patent" being the thinest parts of the paper, and the water mark produced by the highest or most prominent part of the mold. The dark lines marked *a*, *a*, in the several figures denote the deepest parts of the die, the highest or most prominent parts of the mold and the strongest water mark or thinnest part of the paper; the fainter lines, *b*, *b*, represent the shallower cut in the die, the less prominent parts of which constitute the surface of the mold and the general character of the paper. The mold Fig. 6, presents two surfaces or planes the one *a a*, which corresponds with the water mark in the ordinary molds and *b*, *b*, which corresponds with the laid surfaces of the ordinary molds and which may for distinction be called the primary surface. Whatever form or design may be given to the parts of the mold raised above what has been termed the primary surface, whether it be composed of parallel lines, or of chequered, or crossed lines, so long as the whole has the same elevation the paper made thereon will present one unvarying shade or intensity of water mark. The design to be produced by the water mark may be of any device or pattern however elaborate and with varying degrees of light and shade, according to the height to which the parts of the molds are raised above the primary surface.

Although the preceding, described or referred to two or more surfaces the molds may have but one surface that is a primary surface only, having a design in the same plane in which case the papers manufactured therefrom would have the water mark properly so called.

The die having been engraved hardened and otherwise properly prepared, by cleaning, is then taken to a hammer or stamp Fig 8, which in front elevation resembles a steam hammer. Fig. 9, is a plan showing the face of the die taken through the line three—four Fig. 8, these drawings show the situation of the die *c*, upon the block of the hammer. The die is properly adjusted and retained in its position by the dog screws *e*, *e*. The block or hammer *f*, is secured to the piston of the steam cylinder *g*, in the ordinary manner and is thereby raised by the action of the steam upon the piston.

h, is the steam pipe; *i*, the eduction pipe and *k*, the slide valve, the handle *p*, is for the purpose of enabling the attendant to work the slide valve *k*, by hand it is also self acting, the slide valve being worked by the action of the adjusting tappets *l*, *l*, upon the tappet rod *m*, which is attached to the hammer or block *f*, the adjustment of these tappets upon their rod adjusting the extent of fall of the hammer the handle *n*, and the rods *o*, *o*, are for governing the throttle valve (placed at *p'*) to regulate the supply of steam to the cylinder. The hammer or block *f*, can be removed from the machine, and its place supplied by others of a shape and size suited to the shape and size of the face of the die. The die *c* being properly adjusted under the hammer *f*, so that the surfaces of these may coincide, a thick plate or block of metal is placed upon the die, or melted metal is poured upon the die. The metal which we ordinarily employ for this purpose is copper at a red heat, or tin in a liquid state. The copper or tin being upon the die the hammer is now put into action and allowed to descend. If a heated metal plate be on the die the hammer is allowed to descend with its full force, the effect of which is to force the metal of the block or plate into the design cut in the face of the die, so as completely to fill the design cut therein and produce a reversed impression of the die upon the under side of the metal plate. The hammer in its ascent takes up the metal plate from the die, and if the impression of the die on the under side of the plate should not be perfect, the hammer may be allowed to descend with a succession of blows until the impression is completed. When tin or other metal in a liquid state is applied to the face of the die the hammer is brought down slowly, so as allow the metal to set in the die and hammer, and on the ascent of the hammer the metal is withdrawn from the die by the hammer. Should the cast impression not be perfect it may be perfected by a repetition of blows as already described. By these means a "force" is produced which should be an exact counterpart, of a

part or of the whole of the die. There are recesses made upon the face of the hammer *f*, into which portions of the metal force enter, for the purpose of retaining and holding the force upon the hammer as is well understood. The design being fully and sufficiently transferred to the metal force, a thin plate or sheet of the metal, which is to form the mold, is to be placed upon the face of the die. The thickness of this sheet will in a great measure depend upon the elevation to which the design upon the mold is to be raised above the laying. Silver, brass, copper or other metals may be employed as best suited to the purposes required. The plate to form the mold being placed upon the die the machine is again set in action. The metal force before spoken of being still retained under the hammer *f*, the result of the blows will be that the mold plate takes the impression of the die throughout the whole of the design, and that the metal of the mold plate is forced to the bottom of the sunken portion of the die. At this stage of the manufacture of the mold, the plate presents the design, but unbroken by any apertures or perforations which are now required to be produced. It may be necessary during the progress of stamping with some description of metal plates, to anneal them, in order to prevent their fracture and to facilitate the operation. The die with the model plate in it is then taken and placed in the machine represented in Sheet C, Fig. 10, being a front elevation of the machine Fig. 11 a side elevation Fig. 12 a plan view, and Fig. 13, a sectional plan through the line 5—6 showing the mold plate and the holding plates. *a*, *a*, is the frame work of the machine upon the plate or table *b*, of which is secured the two sandards *c*—*c* the upper ends of these are provided with screws *d*, *d*, and the nuts *d'*, *d'*, the purpose of which is to screw down the frame or upper plate *e*. To the extreme upper ends of the standards or screws, is permanently secured, by nuts, the cross head *f*. To the middle of the upper plate *e*, is secured the vertical screw *g*, which passes loosely through a hole in the boss of the cross head *f*, and has the wheel nut *h*, upon it above the cross head. This screw is for the purpose of raising the upper plate *e* when required. To the under side of the upper plate *e*, *e*, is secured a block of wood *i*, having a number of grooves or notches in it, for the reception of the vertical metal plates *l*—*l*—*l*,—*m*, is the steel die with the mold plate secured in its proper position upon the table *b*, *b*, by means of the dog screws *o*, *o*, *o*, *o*. The mold plate is secured in the machine by means of the vertical plates *l*, *l*, *l*. This apparatus is for the purpose of securely holding the mold plate, and preventing any injury to or derangement in the design during the process of cutting and filing the surface of the mold plate, so as to produce the requisite interstices. This filing is done by the employment of a large file which takes off the back of the mold plate, that is that portion of it which projects above the face of the die, leaving untouched that portion of the mold plate below the surface or within the design upon the die. Only one or two of the vertical plates are removed at a time just sufficient to allow width for the file to pass and file away that portion, the other plates being securely held to prevent shifting. When this portion of the back of the mold plate is abraded off by the action of the file, one or more of the plates are to be removed and replaced over the recently abraded parts. This process is repeated the plates being removed and then replaced after the abrasion has been effected, until the whole of the back surface above the face of the die shall have been removed.

The mold plate on being removed from the die is found to present the appearance of the intended design, or the more prominent parts only which were given to the mold plate by the action of the die and the forces. The plate has now the appearance represented in Fig. 6, the darker parts marked *a*, *a*, being the more prominent or projecting parts of the design, and the lighter parts marked *b*, *b*, being the less prominent or projecting parts of the design, whilst the portions remaining white in the figure correspond with the portions of the mold plate left at its original surface, and which have been abraded away as described, producing the apertures or interstices required. The mold plate may now be said to have entirely changed its character, and when placed in a frame upon the backing becomes a mold for the manufacture of paper, which mold will present the appearance shown in Fig. 6. We sometimes cut or abrade away the portions required of the mold plate, by a different method. We dispense with the employment of the vertical plates for holding down the mold plate upon the die, and in lieu thereof employ the perforated plate shown in Fig. 14. This plate is placed upon the mold plate in the die and screwed down by the nuts and bolts *p*, *p*, which securely hold and prevent the mold plate from shifting. A revolving drill or cutter is employed which entering the perforations of the plate cuts or removes the parts required of the mold plate. When the whole surface under the perforations shall have been cut away or abraded, the die and consequently the mold plate with it, or if required the perforated plate may be shifted and other portions of the mold plate cut

until the whole surface is complete producing the same result as the method before described. The "backing" of paper molds it is well understood consists of a series of parallel wires connected by transverse stitching and twisting, in the same manner as the laid wires of a mold, though less numerous but still so disposed that they shall coincide with the laid wires of the mold. Backing of this description may be used in conjunction with our improved molds, although we prefer to form the backing as follows.

Our improved "backing" is formed in a precisely similar manner to the mold plates. The wires that coincide with the position of the laid wires are represented by a series of parallel angular grooves in the forming die, while the seams are represented by a series of similar grooves, in a position transverse to the other grooves and disposed at similar distances as the seams or at such distances as will give the necessary strength to the plate; in order to add to the strength the transverse grooves are sunk to a greater depth than the others; this also forms raised projections on which the mold rests when placed in the backing. A metal plate is indented in this die in a similar manner to that described with reference to our improved mold plates. The whole of the upper surface of this plate or the metal remaining in the plane of the original plate is removed by abrasion or perforation as also before described with respect to our improved mold, this operation leaving only the indented portions which forms an interstitial plate constituting our improved backing. The interstices being of the size and form prescribed by the cross bars or indented portions of the plate. This is then connected by screws or other suitable means to our improved molds. The side of the mold from which the superfluous metal has been abraded and the reverse side of the backing being the surfaces placed in contact. Similar backings are also applicable to wove wire molds. A design for the water mark produced in the manner herein described may be applied to the ordinary molds of wire whether laid or wove, and attached to such surfaces by solder or other means or stitching by wire as in the ordinary method. Fig. 15 shows the adaptation of a design formed and constructed according to the old method as shown in Fig. 3, the design is supposed to be the same and the section is through the line 1, 2.

The design *d*, it will be seen presents the same semi-circular appearances upon its upper surface as the wire designs of the old method, but the lower portion of it is seen to be square instead of semi-circular. The designs and molds when made according to our method present this form and constitute one of the advantages of our invention, by facilitating the escape of the water from the pulp during the process of making paper. Fig. 16, shows a portion of a mold made according to our improvements and Fig. 17, a section of ditto through 3—4; both the design *d*, and the parallel portion *a*, *a*, of the laying as also the seams and connections *b*, *b*, being formed at one operation, and of one piece of metal, as previously described. There is no joining necessary in this mold, and the seams or connections *b*, *b*, being wholly below the underside of the pulp upon the mold, do not interfere with the drainage of the water from the pulp, and are not productive of any marks in the paper. However, if it is required to produce in the paper the faint marks, usually produced by the laid surface and the seams, then these connections are placed at the dotted line *g*—*g*, Fig. 18, shows the same mold the design *d*, being made of gradually varying height, for producing in the paper a gradually varying tint of water mark. When it is required to produce a design or laying of an equal number in each lineal inch a seam is absolutely necessary at the points of junction, if made by the old method, which seam will leave a corresponding mark in the paper produced, but if made according to our improvement the seams or connections being below, no such mark will be shown in the paper.

It will be obvious that other machinery and apparatus for stamping the plates into the molds and for holding the plate during the production of the interstices may be employed, but the machinery or apparatus shown in the drawings is the best with which we are acquainted for the purpose. It will also be obvious that the electrotype process may be employed for the production of the mold plates and designs or they may be cast in the well known process of stereotype or other mode of casing but we believe the methods hereinbefore described by stamping the plates into the die to be most advantageous.

Various kinds of apparatus and machinery are in use for the manufacture of paper and card board by hand and otherwise and it will be obvious that our improved molds may be adapted to and combined with such apparatus and machinery instead of the molds and designs at present employed.

Having now described the nature of our said invention and in what manner the same is to be performed we wish it to be understood that we do not claim as of our own invention nor do we claim the exclusive use of the apparatus and machinery herein described and referred to for stamping and

filling except when employed in and for the production of our improved plates or molds.

We hereby declare that we claim as our invention—

The improved molds for the manufacture of paper, as made in the manner herein specified, that is to say, by stamping or forming such molds partly or wholly in and by dies, and afterwards removing the back of such molds by filing or other process analogous thereto.

In witness whereof the said WILLIAM BREWER and JOHN SMITH have hereunto set their hands this twenty fifth day of April in the year of our Lord one thousand eight hundred and fifty.

WILLIAM BREWER.
JOHN SMITH.

Witnesses:
JOSEPH MARQUETTE,
CHARLES JOHNS.