(No Model.)

T. JOHNSON & J. McDONNELL.

APPARATUS FOR MOLDING THE FRAMES OF SHIPS AND TRANSFERRING CURVES.

No. 306,081. Patented Oct. 7, 1884.

Fig. 1

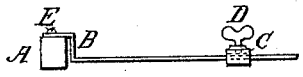
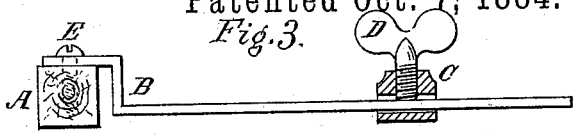


Fig. 3.



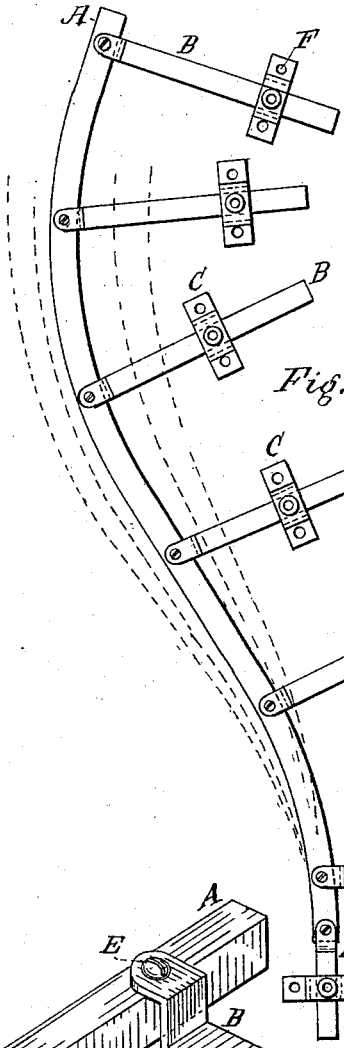


Fig. 2.

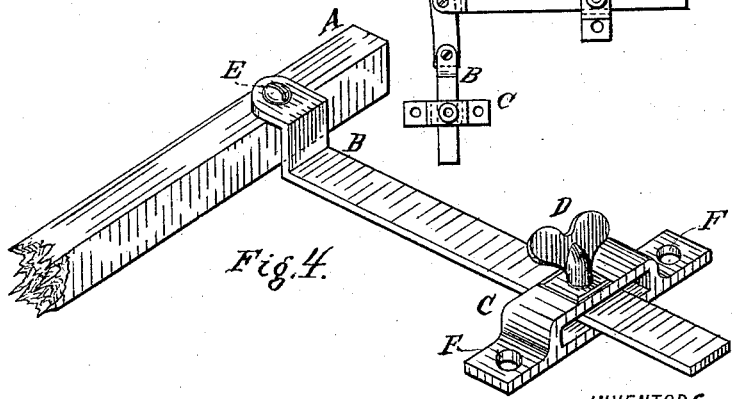


Fig. 4.

WITNESSES

Robt. Haase

W. C. Dodge

INVENTORS

Thomas Johnson

John McDonnell

By J. A. Ashley

Attorney

UNITED STATES PATENT OFFICE.

THOMAS JOHNSON AND JOHN McDONNELL, OF WILMINGTON, DELAWARE.

APPARATUS FOR MOLDING THE FRAMES OF SHIPS AND TRANSFERRING CURVES.

SPECIFICATION forming part of Letters Patent No. 306,081, dated October 7, 1884.

Application filed December 5, 1883. (No model.)

To all whom it may concern:

Be it known that we, THOMAS JOHNSON and JOHN MCDONNELL, citizens of the United States, and residents of Wilmington, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in Apparatus for Producing Molds for Transferring Curved Lines in the Construction of Ships, of which the following is a full, clear, and exact description.

Heretofore it has been common in molding or forming the frames of vessels to first "lay down" upon a floor the desired "line" or pattern, enlarged from the outline of the model previously prepared, and then to detachably secure upon the floor along such line thin strips of wood, upon which in turn boards have been fastened to retain the strips in position for removal to the yard for application to those parts of the vessel to which the lines are to be transferred. In some instances nails or other metallic substances have been applied to the lines upon the floor in such a manner as to project upwardly therefrom, so that when a board has been pressed down upon the same marks or indentations have been formed upon the under surface thereof corresponding to the line. It has been proposed, also, to employ two flexible metallic strips, one of them to be adjusted to the lines, and secured at a suitable distance from the other strip and parallel thereto by means of set-screws which are fixed to the one, and which extend through slots formed in the other for adjustment thereon, the whole when properly adjusted to be removed bodily to the ship-yard or other place where the pattern is to be used. It has been proposed, also, to transfer curved lines by means of a laterally-flexible rod or ribbon, to be adjusted and held in place by means of a series of double posts and a corresponding series of rigid braces secured by set-screws, the whole forming an adjustable trestle-work which is adapted and intended for application to the sides of a vessel in order to obtain the profile thereof; and in still another instance it has been proposed to construct a conformator in which the ends of each of a series of rigid slotted rods are adjusted against the inner surface of a vessel, and are secured in position by set-screws which engage between two rigid connected parallel bars. These constructions are not applicable for the purposes for which our apparatus is designed, our object having been to devise a method and apparatus by means of which "the lines" of a vessel when "laid down" upon a molding-floor may be rapidly and accurately transferred to the "molds" for immediate use in the ship-yard.

We employ a strip of wood or metal technically known as a "batten," of any desired length, and of such flexibility as to adapt it to be bent to any required curvature. To this flexible strip or batten are attached, preferably pivotally, a series of flexible bars or rods of metal, wood, or other suitable material which project from one side of the batten and pass loosely through suitable orifices in a corresponding series of independent keepers which are secured to the floor, platform, or other surface upon which the batten is placed at any desired point by screws or otherwise, the keepers being provided with thumb-screws for holding the bars in position. At one end of the batten is a similar bar, keeper, and thumb-screw by which the same is held against longitudinal displacement, and within short distances is made longitudinally adjustable.

In operation, the curved lines having been drawn upon the floor or other surface, the batten is adjusted thereto and held in position in an obvious manner by means of the sliding bars, the keepers which are placed laterally to the batten, and the thumb-screws, the batten being moved to the right or to the left as the location of the line may require. The adjustment being completed, the batten is lifted slightly from the floor, the bars being made sufficiently flexible to permit this to be done, and a board or a sheet of other suitable material is placed beneath it when the line is transferred to the surface of the same by means of a pencil or other suitable implement which is passed along the edge of the batten. The board is then shaped to correspond to the line thus transferred, and is used as a mold to which the members of the iron (or other) frame of the vessel are to be conformed by bending or otherwise. Although, as already stated, the independent keepers are attached to the floor in such a manner that they may be detached therefrom, if desired, under all ordinary cir-

cumstances they will remain fixed thereto, and if the flexible bars or rods be made of a length sufficient to permit the required curvature of the batten, the keepers need never be removed at all, even in molding vessels of the largest size. It will be noted that the adjusting rods or bars are not attached to each other, and that each of them is entirely independent of all the others, and is connected only to the flexible batten and to the independent fixed keepers.

In the drawings, Figure 1 is an end elevation. Fig. 2 is a plan view representing the batten as adjusted to a curved line, and showing also, by dotted lines, other curves indicating the adjustment of the batten at other stages of the work. Fig. 3 is an enlarged end view of the apparatus, the keeper being shown in vertical section. Fig. 4 is an enlarged perspective view showing a single adjusting-bar, keeper, and thumb-screw in connection with the batten.

In all the figures, A designates the batten; B, the sliding adjusting-bars; C, the keepers; C′, an orifice or passage in the keepers; D, the thumb-screws; E, the pivots or screws by which the bars are loosely attached to the batten; F, securing-orifices in the ends of the keepers, and B′ an adjusting-bar attached to one end of the batten.

Having thus described our invention, what we desire to claim and secure by Letters Patent, is—

1. The combination, with a molding-floor, of a series of keepers attached to such floor, each of the keepers having a horizontal passage extending therethrough, a vertical threaded passage which extends from the top of the keeper to the horizontal passage, and a thumb-screw which is adapted to the vertical threaded passage.

2. In an apparatus substantially of the character herein specified, the combination of a series of independent fixed keepers, a flexible batten, and a series of independent flexible adjusting-rods constructed and arranged to operate in the manner described.

3. The combination, with a molding floor or platform, of a flexible batten, a series of independent keepers which are fixed to the floor or platform, and a series of independent flexible adjusting-rods which at one end are connected to the batten, and at the opposite end are adjustably connected to the keepers, substantially as and for the purposes set forth.

4. The combination, with a molding floor or platform, of a flexible batten, laterally-placed independent keepers which are attached to such floor, a lateral series of independent flexible adjusting-rods which are connected to the batten, and which are adjustably connected to the keepers, an end keeper, and an end adjusting-rod, the whole being constructed and arranged for operation substantially in the manner described.

5. The combination, with a molding-floor, of an independent series of perforated keepers which are fixed to the floor, a flexible batten, a series of independent flexible rods which at one end extend into the perforations in the keepers, and which at the opposite end are pivotally connected to the batten, and a series of thumb-screws which are adapted to secure the flexible rods in any desired relation to the keepers, substantially as shown and set forth.

6. In an apparatus for transferring the lines laid down upon a molding-floor from the model of a vessel, the combination, with a series of independent keepers which are secured to such floor, of a flexible batten and a series of independent flexible adjusting-rods, each of which is at one end pivotally connected to the batten, and at the opposite end is adjustably connected to one of the independent fixed keepers, substantially as specified.

7. The combination, with a molding-floor, of an independent series of keepers which are fixed to the floor, and which are each provided with a horizontal perforation and with a vertical passage which is threaded to receive a thumb-screw, a flexible batten, and a series of independent flexible rods which at one end extend into the horizontal perforations in the keepers, and which at the opposite end are pivotally connected to the batten, substantially as and for the purposes described.

THOMAS JOHNSON.
JOHN McDONNELL.

Witnesses:
JOHN C. COLE,
PETER SPRINGER.