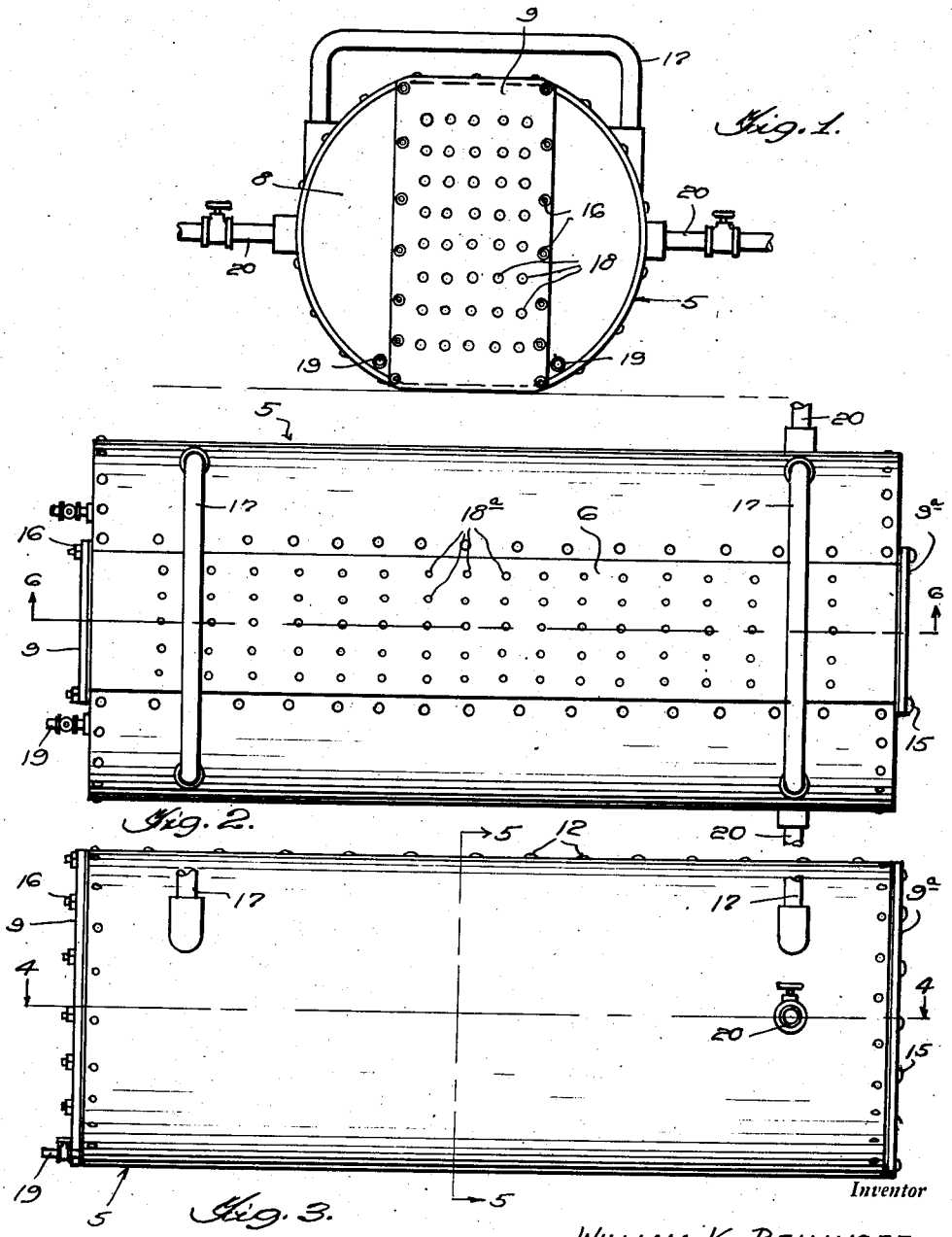
Oct. 9, 1945. W. K. BEINHOFF 2,386,535

SHAPING PRESS

Filed Oct. 20, 1944 3 Sheets-Sheet 1



Inventor

WILLIAM K. BEINHOFF,

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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SHAPING PRESS

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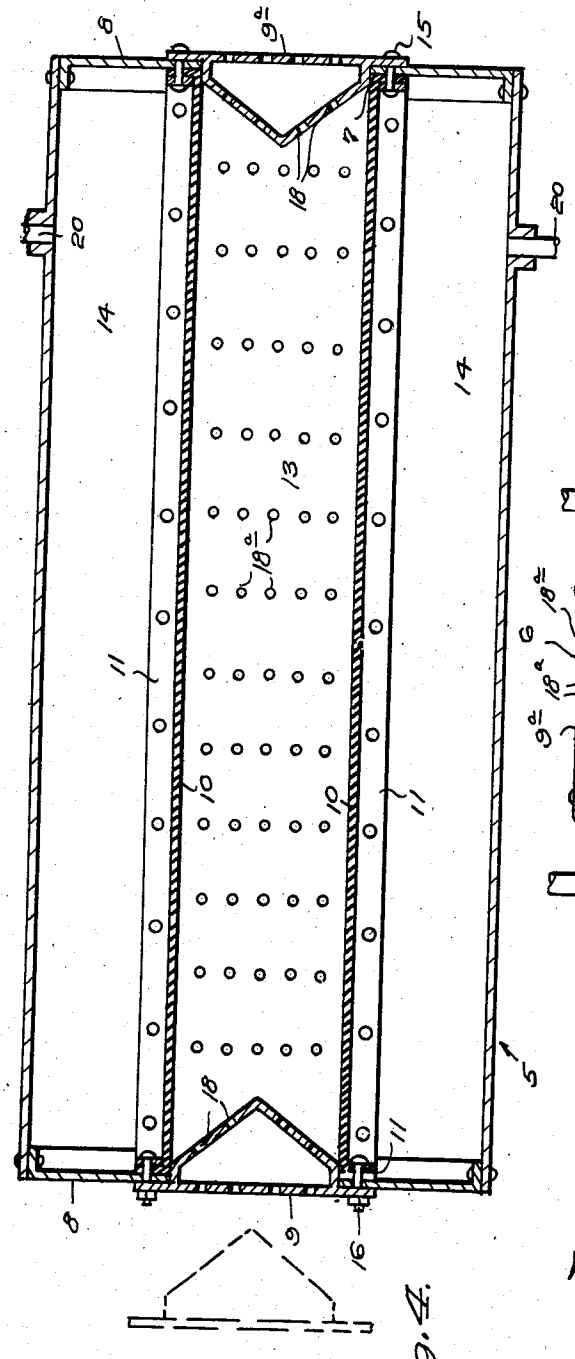


Fig. 4.

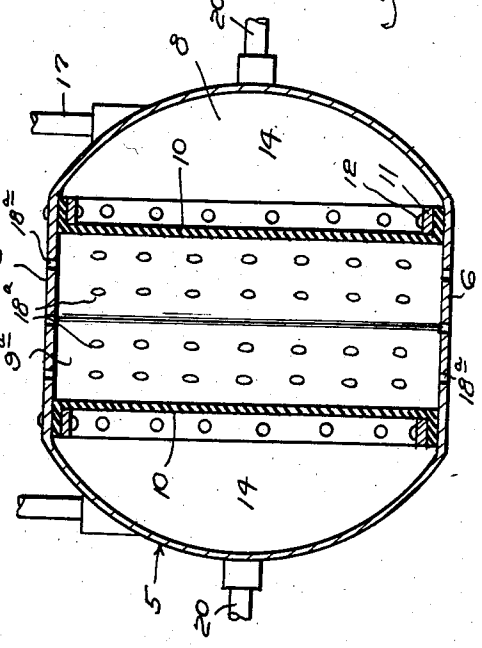


Fig. 5.

Inventor

WILLIAM K. BEINHOFF,

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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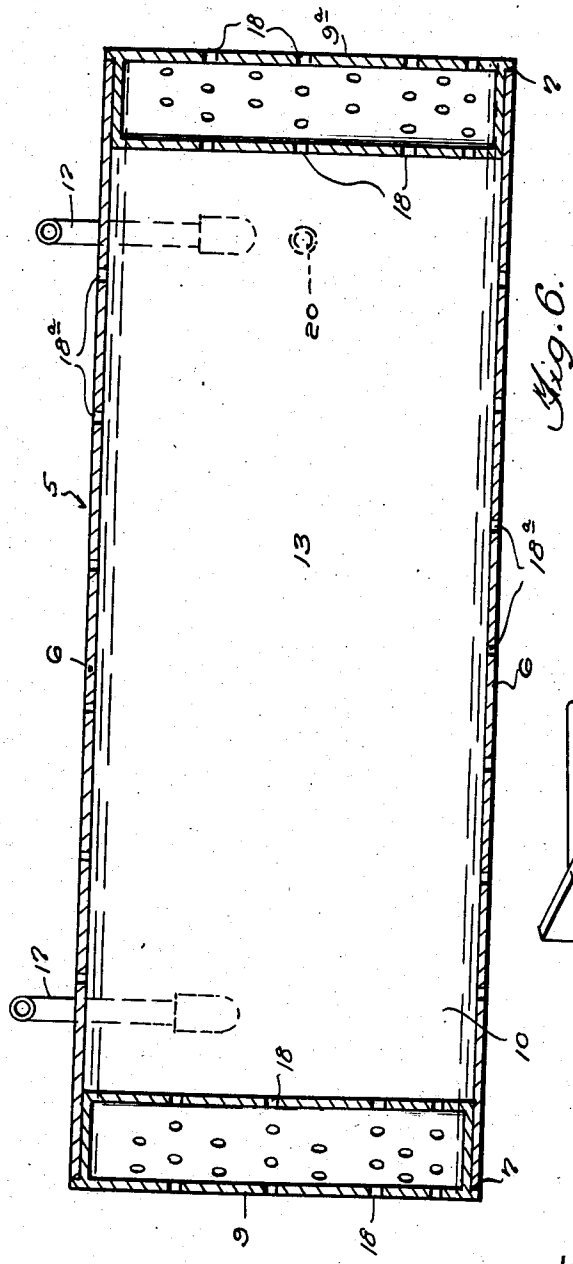


Fig. 6.

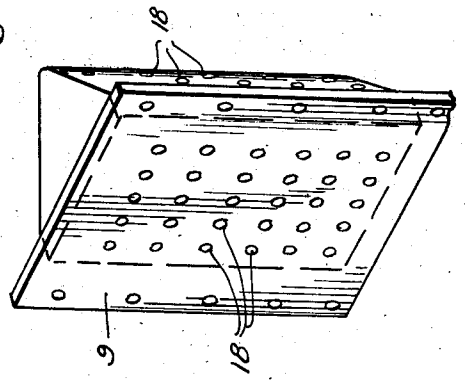


Fig. 7.

Inventor

WILLIAM K. BEINHOFF,

By Clarence A. O'Brien and Harvey B. Jacobson, Attorneys

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UNITED STATES PATENT OFFICE

2,386,535

SHAPING PRESS

William K. Beinhoff, Cleveland, Ohio

Application October 20, 1944, Serial No. 559,541

4 Claims. (Cl. 144—281)

This invention relates to an improved press for shaping wooden or light metal parts so as to give them a curved form.

At the present time, thin veneers of wood are shaped or formed against a curved form, the thin veneers alternating with layers of thermal and pressure-setting plastic, the plywood formed by the veneers and layers of plastic being wrapped in a flexible elastic bag, the air being extracted from the bag, and the wrapped plywood, with its form, being inserted in a pressure tank and subjected to steam at a pressure of about 300 pounds per square inch.

The primary object of the present invention is to provide a shaping press by means of which the parts may be shaped without the necessity of wrapping the parts and their forms in a flexible elastic rubber bag, or the like, and extracting the air from the bag.

A more specific object of the invention is to provide an improved shaping press of the above kind which is comparatively simple and durable in construction, convenient to use, and highly efficient in use.

The present invention consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings, wherein like reference characters indicate corresponding parts throughout the several views:

Figure 1 is a front elevational view of a shaping press constructed in accordance with the present invention.

Figure 2 is a top plan view thereof.

Figure 3 is a side elevational view of the same, partly broken away.

Figure 4 is a horizontal longitudinal section taken on line 4—4 of Figure 3.

Figure 5 is a vertical transverse section taken on line 5—5 of Figure 3.

Figure 6 is a central vertical longitudinal section taken on line 6—6 of Figure 2, and

Figure 7 is an enlarged perspective view of the removable door for the middle or shaping compartment of the press.

Referring in detail to the drawings, the present invention includes a pressure tank 5 of standard boiler construction, but with a flat central portion 6 at the top and bottom and running the full length of the tank. A central opening is left at 7 in each end wall 8 of the tank, said openings being of the same width as the flat portions 6 of the tank and extending from top to bottom of the latter. The end openings at 7 are closed by heads 9 and 9a of triangular form in horizontal section and hollow, as shown in Figures 4 and 6. Each head is disposed with one angle of the triangle jutting into the tank 5 intermediate the sides of the latter.

Installed at the plane of each side of the flat portions 6 within the tank 5 are flexible elastic partitions 10 that are preferably composed of sheets of synthetic rubber held in place by metal clamping strips 11 and bolts or rivets 12 which pass through the strips 11, the margins of the partitions 10 and the walls of the tank, the margins of the partitions being disposed between the strips 11 and the tank walls. A middle or shaping compartment is thus formed intermediate the sides of the tank, as at 13, and steam spaces or compartments 14 at opposite sides of said middle or shaping compartment.

The head 9a is permanently secured in place by rivets 15, while the head 9 is removably secured in place by nutted bolts 16 so as to form a door that may be opened to facilitate insertion of the parts to be shaped into the middle or shaping compartment 13 or removal of the shaped parts from said compartment 13.

At or near each end, the tank is provided with a bypass pipe 17 that places the steam compartments 14 in constant communication with each other so that the steam pressure within said compartments 14 will be effectively equalized. In this way, exactly equal pressure is applied to the partitions 10 for forcing them toward each other. Due to the angular portions of the heads 9 and 9a jutting into the ends of the middle or shaping compartment 13, undue stretching of the partitions 10 at the ends of the latter is avoided during the shaping operation. It will, of course, be understood that the compartments 13 and 14 are non-communicating so that the steam will not find its way into the compartment 13 from the compartments 14. The walls of the heads 9 and 9a are provided with numerous small perforations 18, while similar numerous small perforations are provided at 18a in the flat top and bottom portions 6 of the tank. These perforations permit escape of air from the compartment 13 as the partitions 10 are stretched and forced toward each other during the shaping operation, and they admit air into the compartment 13 when the pressure is removed and the partitions 10 are allowed to return to their normal condition. Obviously, the partitions 10 may be made with some fullness so as to minimize the stretching thereof necessary when subjected to pressure. They are merely shown as of normally flat form for sake of clearness. Also, the perforations 18 and 18a are made sufficiently small so that there will be no danger of the partitions 10 entering and passing outwardly through said perforations. Due to the large number of the perforations 18 and 18a, a rapid action is permitted due to the ready and unrestricted escape of air from or entry of the air into the compartment 13.

A condensation drain 19 is provded for each pressure compartment 14, preferably at the lower

forward end portion of the tank. Steam supply pipes 20 are provided for the compartments 14.

In use, the door-forming head 9 is removed and the parts to be shaped are applied to their forms and placed in the intermediate or shaping compartment 13. The head 9 is then secured in place again so as to close said compartment 13. Steam under pressure is then admitted to the compartments 14 through pipes 20, thereby forcing the partitions 10 toward each other and causing the parts to be intimately shaped against their forms. Steam is admitted under proper pressure so that the parts are effectively heated and shaped, the pressure in the compartments 14 being exactly equalized by provision of the bypass pipes 17. As the partitions 10 are stretched and forced toward each other, the air in the chamber 13 is forced therefrom through the perforations 18 and 18a. Upon completion of the shaping operation, the steam pressure is removed from the compartments 14 and the partitions 10 are allowed to return to their normal condition. When the latter takes place, air is allowed to again enter the compartment 13 through the perforations 18 and 18a. The door-forming head 9 is then unfastened and removed so that the shaped parts, together with their forms, may be removed from the shaping chamber 13. The compartments 14 may be equipped with pressure gauges to facilitate attaining correct pressure in said chambers 14.

From the foregoing description, it is believed that the construction and operation, as well as the advantages, of the present invention will be readily understood and appreciated by those skilled in the art. It will be noted that use of the present shaping press renders it unnecessary to wrap the material to be shaped and its form in a rubber bag or blanket or to extract the air from the blanket before inserting the wrapped material or part in the pressure tank. Also, it will be apparent that the press is of comparatively simple and durable construction, is easy to use, and efficient in use. While I have described the invention as using steam for the heating and pressure medium, it will be apparent that any other equivalent medium may be used, such as hot oil under pressure.

What I claim is:

1. A shaping press of the character described, comprising a horizontally elongated pressure tank having a flat portion at the top and bottom running the full length of the tank, said tank having end walls provided with openings of the same width as the flat portions of the tank and extending from top to bottom of the latter, flexible elastic partitions secured in the tank in the planes of the sides of said flat portions and dividing the tank into an intermediate shaping compartment and pressure compartments at each side of said shaping compartment, heads closing the openings in the ends of the tank and having angular portions jutting into the ends of the shaping compartment, there being air escape and inlet perforations through the walls of the heads and the flat portions of the tank, means for removably securing one of the heads in place so that it may be removed for access to the shaping compartment, and means for introducing a heated fluid under pressure into the pressure compartments.

2. A shaping press of the character described, comprising a horizontally elongated pressure tank having a flat portion at the top and bottom running the full length of the tank, said tank having end walls provided with openings of the same width as the flat portions of the tank and extending from top to bottom of the latter, flexible elastic partitions secured in the tank in the planes of the sides of said flat portions and dividing the tank into an intermediate shaping compartment and pressure compartments at each side of said shaping compartment, heads closing the openings in the ends of the tank and having angular portions jutting into the ends of the shaping compartment, there being air escape and inlet perforations through the walls of the heads and the flat portions of the tank, means for removably securing one of the heads in place so that it may be removed for access to the shaping compartment, and means for introducing a heated fluid under pressure into the pressure compartments, said heads being hollow and of substantially triangular form in horizontal section.

3. A shaping press of the character described, comprising a horizontally elongated pressure tank having a flat portion at the top and bottom running the full length of the tank, said tank having end walls provided with openings of the same width as the flat portions of the tank and extending from top to bottom of the latter, flexible elastic partitions secured in the tank in the planes of the sides of said flat portions and dividing the tank into an intermediate shaping compartment and pressure compartments at each side of said shaping compartment, heads closing the openings in the ends of the tank and having angular portions jutting into the ends of the shaping compartment, there being air escape and inlet perforations through the walls of the heads and the flat portions of the tank, means for removably securing one of the heads in place so that it may be removed for access to the shaping compartment, means for introducing a heated fluid under pressure into the pressure compartments, and constantly open bypass pipe connections between the pressure compartments at opposite ends of the tank.

4. A shaping press of the character described, comprising a horizontally elongated pressure tank having a flat portion at the top and bottom running the full length of the tank, said tank having end walls provided with openings of the same width as the flat portions of the tank and extending from top to bottom of the latter, flexible elastic partitions secured in the tank in the planes of the sides of said flat portions and dividing the tank into an intermediate shaping compartment and pressure compartments at each side of said shaping compartment, heads closing the openings in the ends of the tank and having angular portions jutting into the ends of the shaping compartment, there being air escape and inlet perforations through the walls of the heads and the flat portions of the tank, means for removably securing one of the heads in place so that it may be removed for access to the shaping compartment, and means for introducing a heated fluid under pressure into the pressure compartments, clamping strips and fasteners extending through said clamping strips and the margins of the partitions for securing the latter in place so as to provide steam-tight joints between the margins of the partitions and the walls of the tank.

WILLIAM K. BEINHOFF.