

[54] PRESS FRAMEWORK

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[56] References Cited

UNITED STATES PATENTS

1,954,651 4/1934 Sherman 100/214
2,491,384 12/1949 MacMillin et al. 100/214

1,945,282	1/1934	Lindgren	100/214 X
1,974,148	9/1934	Byerlein	100/214
2,230,288	2/1941	Dinzi	100/214
2,306,716	12/1942	Albers	100/214
2,843,204	7/1958	Munschauer	100/214 X
3,030,879	4/1962	Lasko	100/214 X
3,302,556	2/1967	Durbin	100/214
3,465,669	9/1969	Doudet	100/214

FOREIGN PATENTS OR APPLICATIONS

330,943 8/1958 Switzerland.....100/193

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[57] ABSTRACT

A press framework consisting of a top section, a table section and frames receiving the ends of these sections. The frames are formed of hollow columns, bridgepieces contacting the ends of the columns and stays passing through the hollow columns and bracing the bridgepieces with respect to the hollow columns.

22 Claims, 2 Drawing Figures

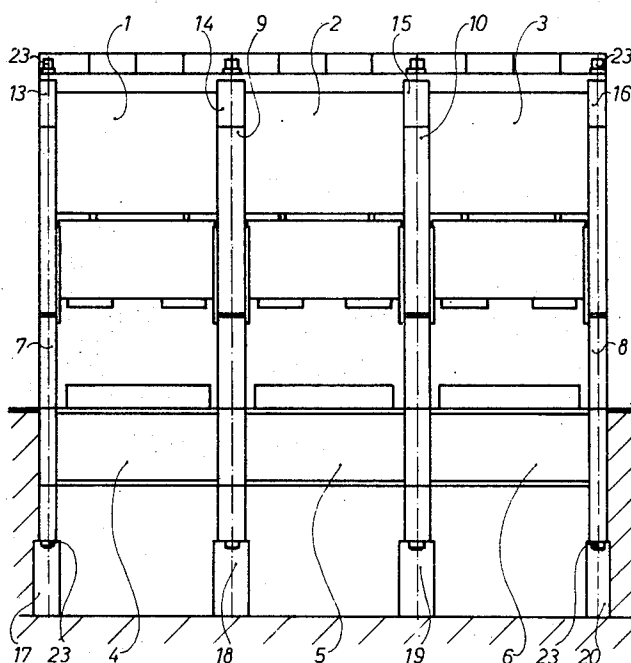
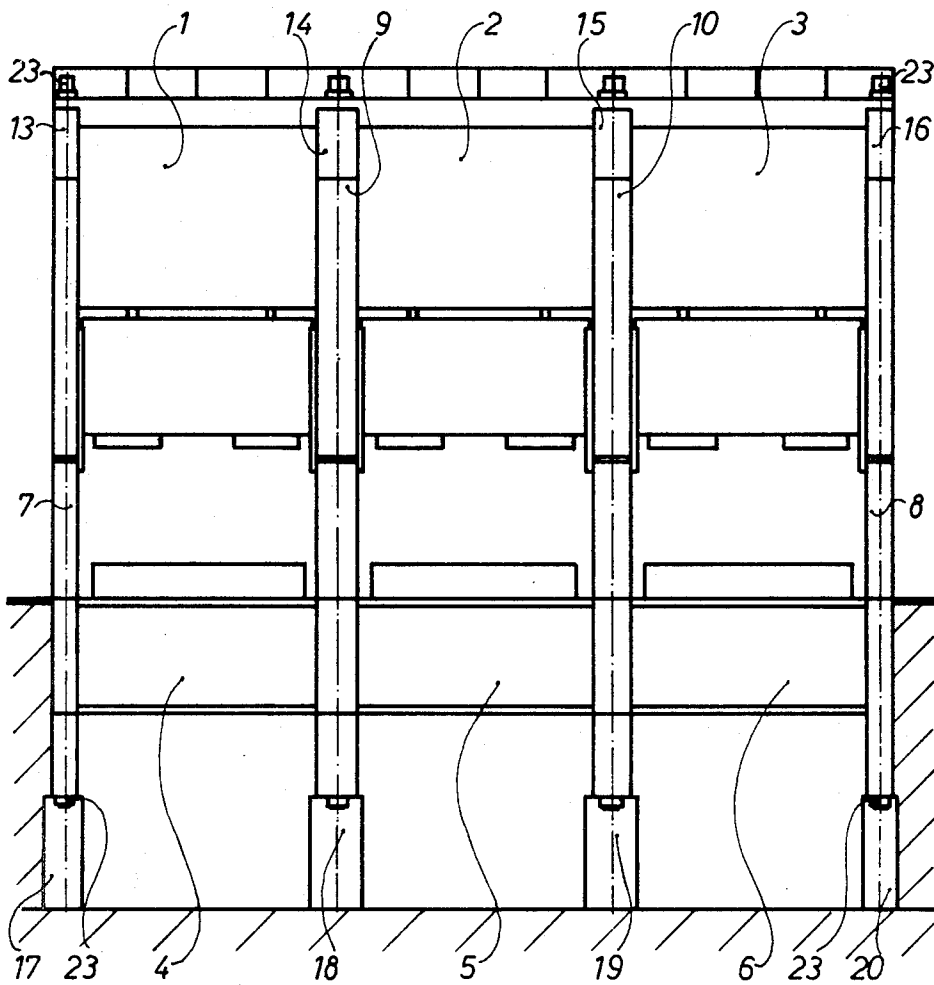


Fig. 1



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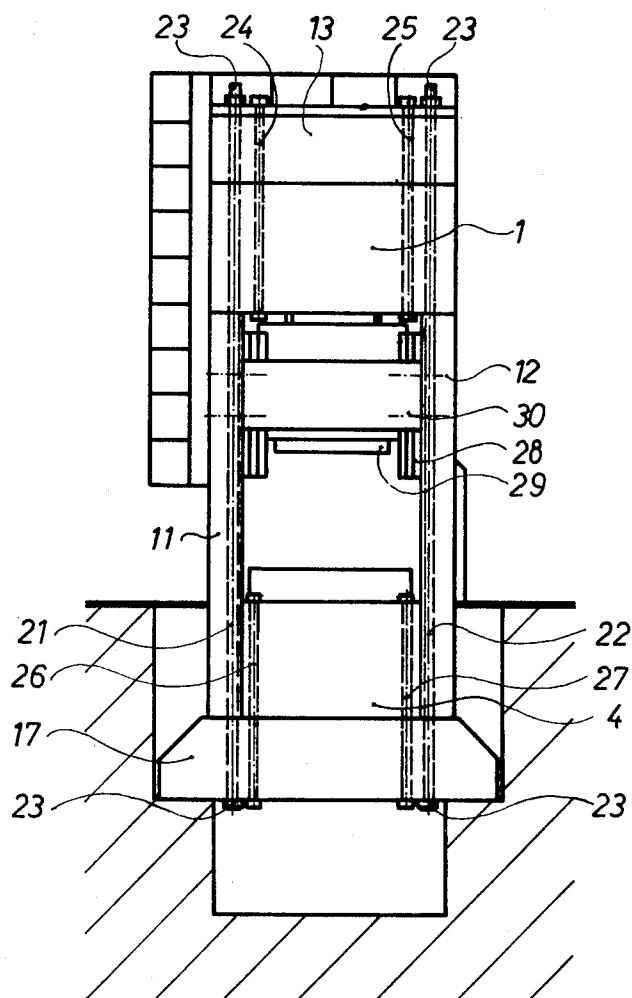
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Fig. 2



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PRESS FRAMEWORK

BACKGROUND OF THE INVENTION

The present invention relates to a press framework consisting of a top section, a table section, and frames receiving the ends of these sections.

It is conventional to design the press frames in one piece as a connecting member between the top or head section and the table section as shown in German Patent No. 471,188. However, there is an upper limit for the dimensions of such one-piece frames, due to the fact that they cannot be manufactured, assembled, and particularly transported at any desired height and width. However, since the dimensions of the workpieces to be press-formed such as, for example, automobile body parts and container sections, girders, etc., are being further increased and since the sizes of the press frameworks must be adapted to these dimensions, the limit is reached beyond which one-piece frameworks cannot be built any more in the required large dimensions for the above-mentioned reasons. Furthermore, it is to be possible to manufacture on gang presses in the future relatively large parts, which heretofore were produced on single presses.

SUMMARY OF THE INVENTION

It is an aim of the present invention to overcome the aforementioned problems and disadvantages by providing a type of frame construction which makes it possible to also construct such presses.

The foregoing problems have been solved, in accordance with the invention, by forming the frames out of two hollow columns or uprights, two bridgepieces or crossrails contacting the ends of the hollow columns, and stays or ties passing through the hollow columns and bracing the bridgepieces with respect to the hollow columns.

Such press frameworks have the advantage over one-piece frameworks that they can be more easily manufactured, assembled and transported, especially in case of larger dimensions.

In accordance with a further feature of the present invention, the top section and/or the table section are affixed to the bridgepieces associated therewith by means of bracing stays. Furthermore, according to the present invention, the hollow columns can be arranged at or close to the ends of the bridgepieces.

In order to prevent jamming of the press ram in its guides and to ensure lateral support for the hollow columns under the operating pressure, bridgepieces are disposed between the hollow columns and braced together therewith in accordance with the present invention.

Since, in case of relatively long press frameworks having only respectively one frame at the ends of the top section and the table section, there is the danger of undue deformations of the press framework, the framework of such presses has, in accordance with another embodiment of the present invention, more than two frames consisting of hollow columns, bridgepieces, and stays.

Usually, the frames extend in the direction of the depth of the press, i.e., they are arranged on both sides of the press framework. Since the frames are provided with a clearance corresponding to the inside spacing of the hollow columns from each other, it is advantageous

in press frameworks, especially when the lateral access the reto is impeded for constructional reasons, to dispose the frames, in accordance with a further feature of the present invention, on the front and in the rear of the press. In this manner, convenient access to the tools, the ram, etc. is provided.

The advantages attained by the present invention reside particularly in that the frame can also be built in relatively large dimensions due to its multiple-section construction. The individual parts thereof, i.e. the hollow columns, the bridgepieces, and the stays, are of simple shape and can be obtained, for example, by casting, forging, welding or the like.

Also, no difficulties are encountered when subjecting these parts to a cutting operation. The construction of the framework from these individual components furthermore facilitates the assembly of the press framework when effected by the manufacturer and also when done by the user and makes it possible to transport the individual parts of relatively large dimensions by means of the conveyances available today for large-scale transporting.

A further special advantage of the present invention resides in that large blanks or workpieces can be fed to the tool from the side of the press. In connection with the automation of the manufacturing process, this requirement has moved increasingly into the foreground.

Another essential advantage for the constructional design, manufacture, and operation of presses equipped with a framework of the present invention resides in the freedom with which the press frameworks can be composed for various requirements. In contrast to the type of conventional framework construction mentioned above, wherein the height and width of the frame are unalterably determined due to the one-piece design thereof, the feature of being multisectional in the present invention makes it possible to adapt the same readily with respect to height and width to the respectively required demands and operating requirements by the use of appropriately dimensioned bridgepieces and hollow columns with stays in the manufacture and use of the framework.

By keeping correspondingly dimensioned parts in storage, it is possible at any time to select the width thereof with the height of the frame remaining the same or the height thereof with the width remaining the same or the height as well as the width, as desired. Thereby, it is also possible to compose entire press lines in correspondence with the respective workpieces, with regard to height and depth of the press, in the manner of a building block or unit construction system.

BRIEF DESCRIPTION OF THE DRAWING

These and further aims, features and advantages of the present invention will become more apparent from the following description when taken in conjunction with the accompanying drawing which shows, for purposes of illustration only, one embodiment of the present invention, i.e. a heavy gang press, and wherein:

FIG. 1 is an elevational view of the press framework in the longitudinal direction, and

FIG. 2 is a side view of the press framework shown in FIG. 1.

DETAILED DESCRIPTION OF THE DRAWING

A press is assumed having relatively large dimensions such as, for example, a length of 20 meters; a depth of 6 meters; and height above the floor of 10 meters. The top section and the table section are subdivided.

Referring now to the drawing and, in particular, to FIG. 1, these sections consist of respectively three individual components 1, 2, and 3 constituting the top section, and 4, 5, and 6 constituting the table section. However, the top and table sections can also consist of one piece extending over the entire length of the press. Four frames consisting of two outer frames 7, 8 and two inner frames 9, 10 receive the top sections and the table sections at their ends. In case of presses of smaller length, the press framework consists only of the two outer frames 7, 8, the top section 1, and the table section 4.

Each frame is formed by two hollow columns 11, 12, two bridgepieces 13, 17; 14, 18; 15, 19; and 16, 20, respectively, resting against the ends of the hollow columns, and by stays 21, 22 which pass through the hollow columns 11, 12 and brace the bridgepieces against the hollow columns 11, 12 by means of nuts 23 contacting the latter. Due to the relatively simple configuration of the individual parts of the frame, the manufacture, assembly, and transportation of these parts do not present any difficulties. The top sections 1, 2, and 3 are held at the associated bridgepieces 13, 14, 15, and 16 by means of bracing stays 24, 25 as shown in FIG. 2. In a corresponding manner, the table sections 4, 5, and 6 are held at the associated bridgepieces 17, 18, 19, 20 by means of bracing stays 26, 27. The hollow columns are disposed close to the ends of the bridgepieces. At the hollow columns, guides 28 can be provided for the press ram 29, which is driven in any desired manner.

Bridgepieces 30 are disposed preferably at the level of the ram guides 28 between the hollow columns 11, 12, and these bridgepieces are braced together with the hollow columns. Although the frames, as shown, extend in the direction of the press depth, it is also possible to arrange the frames on the front and rear of the press, if necessary. This type of construction of the press framework is shown in FIG. 2, which is an elevational view of the front or rear side of the press.

It can be seen that the press framework of the present invention can not only be made practically as long as desired — in accordance with the dimensions of the workpieces to be pressworked — by the use of more than two frames, but it is, above all, also possible to enlarge the depth of the press as seen from FIG. 2 to any dimension required by the respective workpieces, by the use of correspondingly long bridgepieces.

While we have shown and described in detail an embodiment in accordance with the present invention, it is to be understood that the same is susceptible of numerous changes and modifications as are encompassed within the spirit of the present invention. We, therefore, do not wish to be limited to the details shown and described herein but intend to cover all such changes and modifications as encompassed by the scope of the present invention.

We claim:

1. Press framework comprising a top section, a table section, and frames receiving ends of the top section and the table section; wherein the frames comprise hollow columns, bridgepieces resting against ends of the columns, and stays passing through the columns for bracing the bridgepieces against the columns, wherein the framework has at least three frames, and wherein bracing stays are provided for holding the top section at the bridgepieces associated therewith.

2. Press framework according to claim 1, wherein bracing stays are provided for holding the table section at the bridgepieces associated therewith.

3. Press framework according to claim 2, wherein the hollow columns are located at least close to the ends of the bridgepieces.

4. Press framework according to claim 3, wherein the bridgepieces are arranged between the hollow columns and are braced together therewith.

5. A variable size press framework arrangement for a press comprising: a top section having a first and second end, a table section having a first and second end, said table section being spaced from said top section and being positioned such that the first and second ends of said table section are in substantial alignment with the respective first and second ends of said top section, a first frame structure connecting said top and table sections to one another adjacent their respective first ends, and a second frame structure connecting said top and table sections to one another adjacent their respective second ends; wherein each of said first and second frame structures includes: first and second column members separated from one another, each of said column members having first and second ends, a first bridgepiece arranged between the respective first ends of the first and second column members, a second bridgepiece arranged between the respective second ends of the first and second column members, first connecting means detachably connecting said first column member to both of said first and second bridgepieces, and second connecting means for detachably connecting said second column members to both of said first and second bridgepieces, said column members and bridgepieces being selectable from a supply of various size column members and bridgepieces such that the dimensions of the frame structure can be selectively varied.

6. An arrangement according to claim 5, wherein each of the column members are constructed as longitudinally extending hollow members, and wherein each of said connecting means are constructed as tie rods extending through a respective column member to clampingly connect the respective bridgepieces to the respective ends of the respective column member.

7. An arrangement according to claim 6, wherein said tie rods extend through apertures provided in the respective bridgepieces.

8. An arrangement according to claim 7, wherein each of said tie rods include interengaging threaded means for detachably connecting the respective bridgepieces to the respective column member.

9. An arrangement according to claim 5, wherein detachable bracing stays are provided for detachably connecting the respective first bridgepieces directly to said top section.

10. An arrangement according to claim 9, wherein detachable bracing stays are provided for detachably connecting the respective second bridgepieces directly to said table section.

11. An arrangement according to claim 10, wherein each of the column members are constructed as longitudinally extending hollow members, and wherein each of said connecting means are constructed as tie rods extending through a respective column member to clampingly connect the respective bridgepieces to the respective ends of the respective column member.

12. An arrangement according to claim 11, wherein said tie rods extend through apertures provided in the respective bridgepieces.

13. An arrangement according to claim 5, wherein detachable bracing stays are provided for detachably connecting the respective second bridgepieces directly to said table section.

14. An arrangement according to claim 5, wherein the first and second structures are disposed respectively at the front and rear of the press.

15. An arrangement according to claim 5, wherein the column members are located at least close to the respective ends of the bridgepieces.

16. An arrangement according to claim 5, wherein the column members are located at the respective ends of the bridgepieces.

17. An arrangement according to claim 5, further comprising a third frame structure similar to said first

and second frame structures, and a second set of top and table sections, said third frame structure being spaced from said second frame structure for supporting said second set of top and table sections along with said second frame structure.

18. An arrangement according to claim 17, wherein each of the column members are constructed as longitudinally extending hollow members, and wherein each of said connecting means are constructed as tie rods extending through a respective column member to clampingly connect the respective bridgepieces to the respective ends of the respective column member.

19. An arrangement according to claim 18, wherein said tie rods extend through apertures provided in the respective bridgepieces.

20. An arrangement according to claim 17, wherein detachable bracing stays are provided for detachably connecting the respective first bridgepieces directly to said top section.

21. An arrangement according to claim 20, wherein detachable bracing stays are provided for detachably connecting the respective second bridgepieces directly to said table section.

22. An arrangement according to claim 17, wherein detachable bracing stays are provided for detachably connecting the respective second bridgepieces directly to said table section.

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