(No Model.)

J. BURNS.

METHOD OF AND APPARATUS FOR THE CONSTRUCTION OF CONCRETE ABUTMENTS, BRIDGE PIERS, &c.

No. 260,159. Patented June 27, 1882.

Fig. 1.

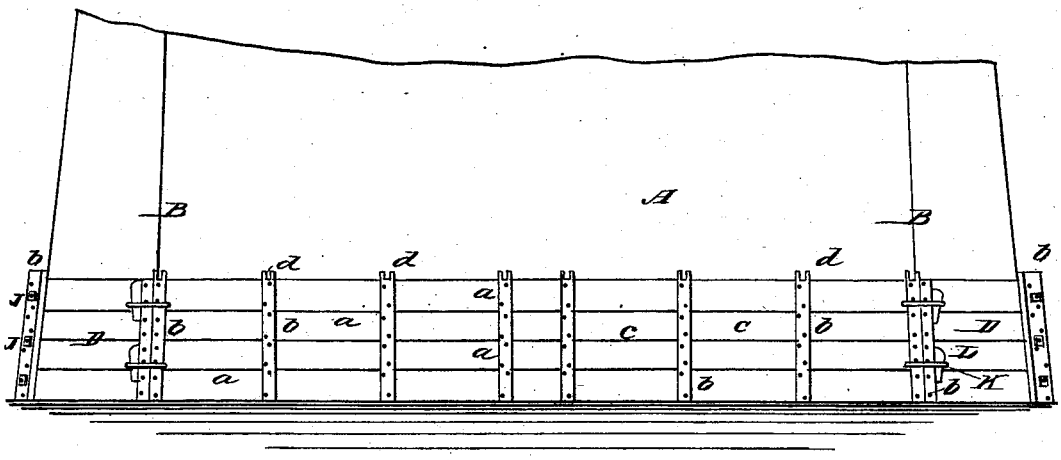


Fig. 2.

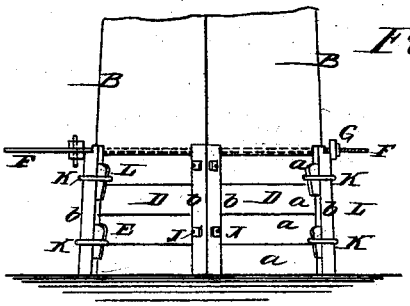


Fig. 4.

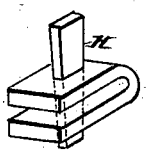


Fig. 3

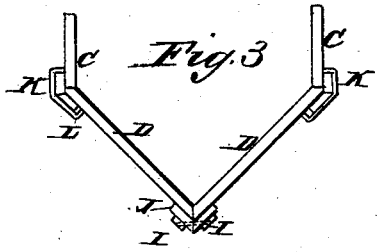


Fig. 5.

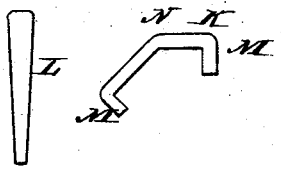
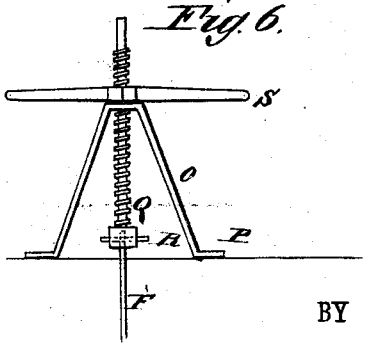


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES BURNS, OF SAN ANTONIO, TEXAS.

METHOD OF AND APPARATUS FOR THE CONSTRUCTION OF CONCRETE ABUTMENTS, BRIDGE-PIERS, &c.

SPECIFICATION forming part of Letters Patent No. 260,159, dated June 27, 1882.

Application filed April 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES BURNS, of San Antonio, Bexar county, Texas, have invented a new and Improved Method of and Apparatus for the Construction of Concrete Abutments, Bridge-Piers, &c., of which the following is a full, clear, and exact description.

This invention consists of a method of building piers and abutments in monolithic character of cement, sand, and broken stone or gravel, called "béton concrete," by laying the same in sectional molds contrived to add successive sections to the molds as the height of the structure increases, the molds being supported against the lateral pressure upon the sides by rods passing through the structure, and being removable when the material solidifies, and the ends of said molds being supported against the lateral pressure upon them by the tension of the sides of the molds, to which the end sections are tied in a substantial manner, all as hereinafter more fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a monolith and the bottom section of the mold for making it. Fig. 2 is an end elevation of Fig. 1. Fig. 3 is top view of a portion of the mold. Fig. 4 is a perspective view of a key-clip used to secure the transverse stay-rods for supporting the sides of the mold. Fig. 5 is a plan view of the corner clip and key employed for tying the end sections to the side sections of the mold; and Fig. 6 is a side elevation of a jack used for removing the transverse tie-rods employed for staying the sides of the mold.

A represents the elevation of a section of a completed tower in side view, Fig. 1, and end view, Fig. 2, the ends being pointed, as shown by the plan of the mold in Fig. 3, and joining the sides by shoulders B, Fig. 1. The pointed ends and shouldered sides are not essential to the form, which may be plain, both on the sides and ends, or of other approved form, if desired. For instance, the ends may be curved to the sides without shoulders or corners.

The mold, of which one-half is shown in Fig. 1, is divided into three sections—viz., middle section, *c*, and end sections, D. All the sections are made of planks *a* and battens *b* firmly nailed together. The battens for the side sections have a notch, *d*, in the top to receive the stay-rods F, which have a nut, G, screwed on at one end, and are fastened at the other end by a key-clip, H, said clip being attached close against the batten and the rod being then screwed up tight. The two parts of the end sections, D, of the mold are permanently fastened by bolts I and clips J at the angles of the ends, and they are detachably keyed to the side sections at the shoulders B by the clamps K and keys L, secured to the respective battens of the said sections, said clamps having the angles M for holding the battens and the keys, and the keys and the angle N conforming to the angle of the shoulder of the structure, said clamp will be curved between angles M, if the column and the mold therefor are so shaped. It will thus be seen that the mold for the first section is substantially stayed for the support of the material to be put in while in a soft, plastic condition, the mold being filled nearly to the top with the material. Another section of the mold, in all respects like the first, is then added, the battens being placed at the lower ends upon the upper ends of the battens of the lower section, and being secured by the key-clips H and the nuts G, or washers employed with them, as will be readily understood by inspection of Fig. 2, and said battens being secured at the upper ends by other stay-bolts, F. The material is then filled in, as before, to the top of the second section, when a third section is added, and so on until the required height of the structure is attained. After the third section is added the bottom section may be removed, which is readily effected by knocking out the keys and removing the key-clips H from the rods. The rods F are then removed by means of the jack, consisting of the tripod O, having feet, hollow screw Q, key R, and screw-lever S, the said jack being placed with the feet P against the side of the structure and the end of the rod inserted and keyed

fast in the head of the screw, the screw-lever then being turned so as to draw the rod the length of the screw, and then set up on the rod for a new hold, and so on until wholly removed.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The improved molds for the construction of concrete piers and abutments, consisting of side sections, C, end sections, D, and stay-rods F, said side and end sections being secured together by the battens *b*, clamps K, and keys L, substantially as specified.

2. The end sections, D, constructed in two parts, permanently connected by bolts I and clips J, and being detachably connected to the side sections by cleats *b*, clamps K, and keys L, substantially as specified.

3. The combination of stay-bolts F, nuts G, and key-clips H with battens *b* of the mold, having notches *d*, substantially as specified.

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