June 21, 1927. 1,633,131

K. SCHOEN

KNOCKDOWN COFFERDAM

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Fig. 1.

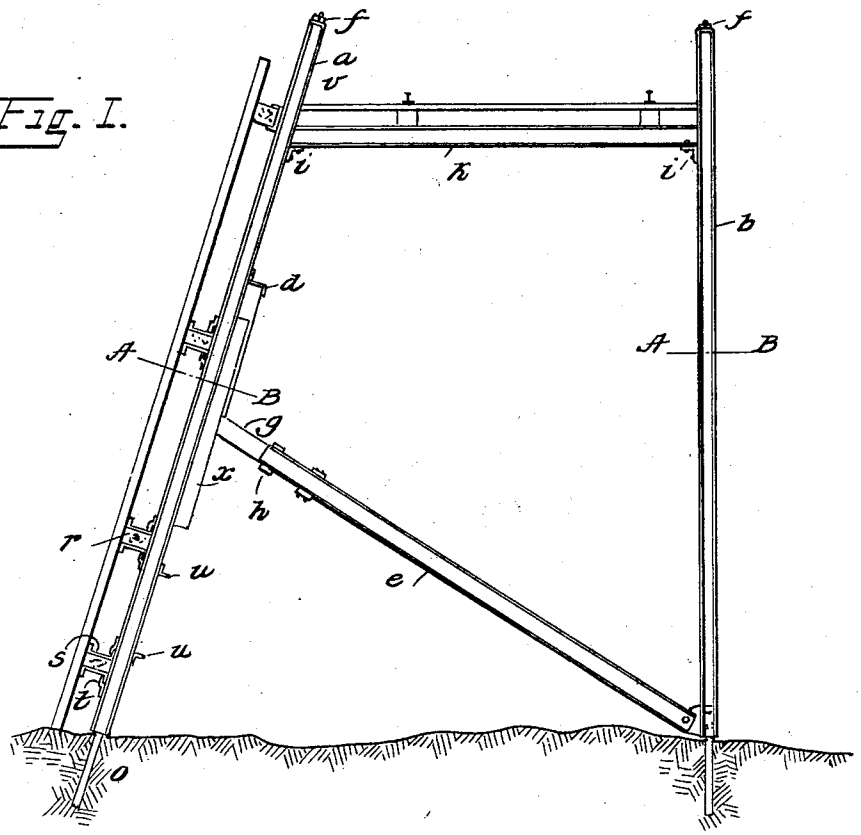


Fig. 2.

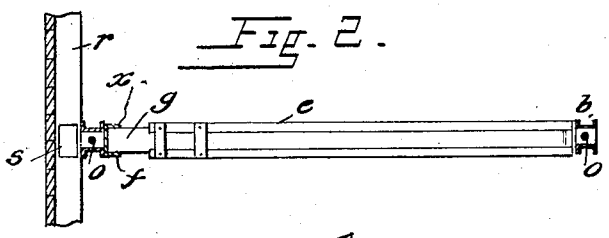
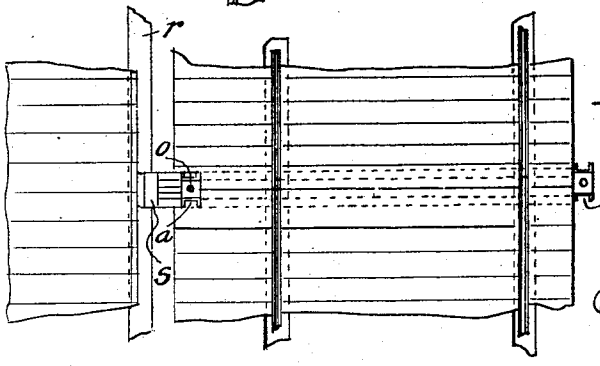


Fig. 3.



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Fig. 4.

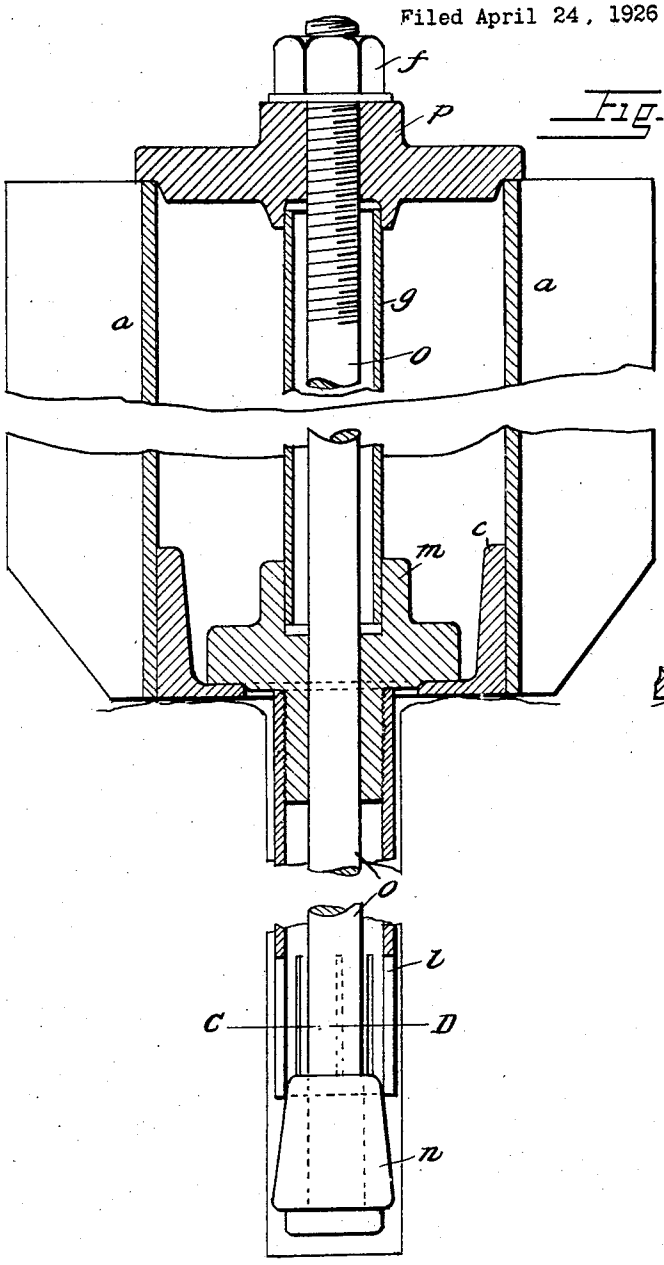


Fig. 6.

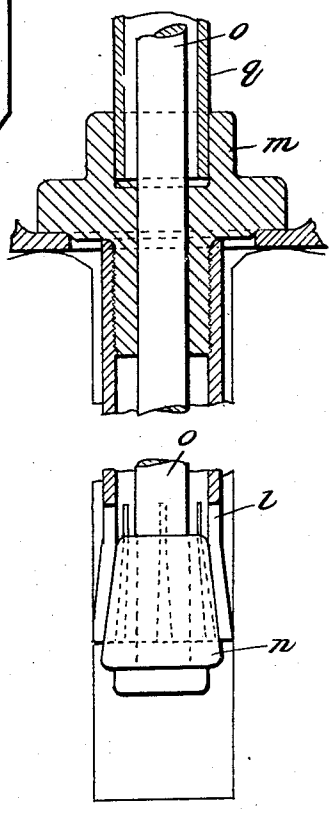
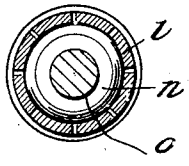


Fig. 5.



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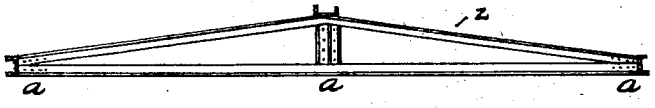


Fig. 7.

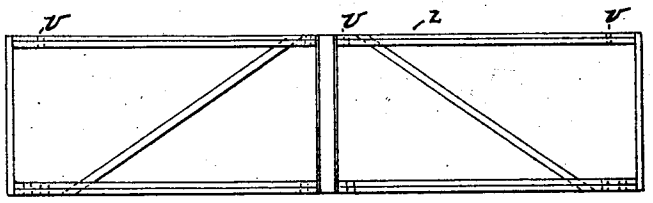


Fig. 8.

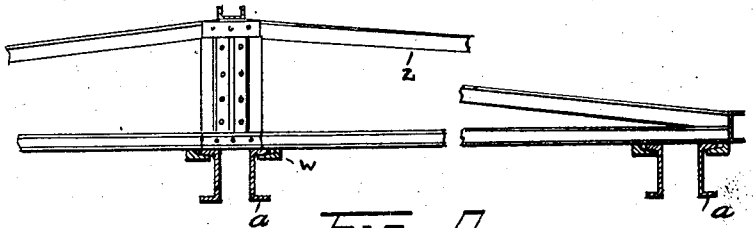


Fig. 9.

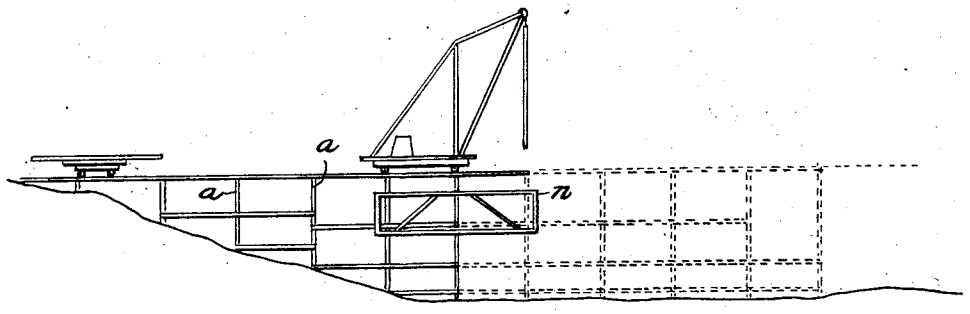


Fig. 10.

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UNITED STATES PATENT OFFICE.

KARL SCHOEN, OF WUERZBURG, GERMANY.

KNOCKDOWN COFFERDAM.

Application filed April 24, 1926, Serial No. 104,359½, and in Germany September 9, 1924.

The purpose of this invention is to substitute iron for wood in the construction of coffer dams and the like; to simplify and improve the securing of such dams to rock bottoms; to enable the dam to be used more than once, and to save time in the erection thereof by reason of its simplicity and ease of assembling, which are of great importance in northern countries, in which the time for construction is limited in winter to the short period of low water. Also the present construction makes it possible to dismount the dam in a short time when abnormally high water occurs, whereas wood dams have to be blown up in such event. By slight variations and additions, it is easily possible to convert the iron dam into a durable but removable emergency dam.

A distinguishing feature of the dam, in accordance with the present invention, is that it consists of a series of plane frames of rolled sections, spaced apart like bridge beams, the supporting posts of said frames being connected together by wooden or other beams, to which are secured in the usual way the boards for forming the dam walls. The supporting posts are secured in rocky bottoms by providing each of them at both ends with guide members connected by pipes, for the reception of a screw-bolt, which is inserted in a hole, made in the rocky bottom, with its lower enlarged wedge-shaped end, and, by tightening up a nut mounted on the upper guide member, coacts with an opposing wedge, likewise set into the hole. The wedge extension of the screw-bolt is, preferably, conical, the counter wedge being a conical sleeve abutting the lower end of the guide member. The placing of the supporting posts of the frame-work is effected successively by the aid of jig frames, which are secured to the upright posts by set-screws or the like, to regulate the distance between adjacent posts, and are provided at their free ends with guides to receive the fresh posts to be set, which latter are thereby held in correct position against the current on the river bottom, so that the guide members and the connecting pipe for receiving the screw-bolt can be used to guide the rock drill.

The accompanying drawings illustrate a form of the invention.

Figure 1 is a cross-section through the dam.

Fig. 2 is a section on line A—B of Fig. 1.

Fig. 3 is a plan view of Fig. 1.

Fig. 4 shows, on a larger scale, the mounting of the supporting posts in the rock.

Fig. 5 is a section on line C—D of Fig. 4.

Fig. 6 shows the post securing means when the nut is tightened up.

Fig. 7 shows one of the jig frames in plan view.

Fig. 8 is an elevation of Fig. 7.

Fig. 9 is a partial elevation of a jig frame on a larger scale.

Fig. 10 represents the erection of the dam.

Each supporting post *a* and *b* consists of two channel-irons placed back to back and closed at their lower ends by an angle-iron apertured for the passage of the anchoring means into the earth. On the upper half of the post *a* is riveted an L-iron *d*, against which the diagonal strut *e* is supported. To guide the latter, a channel-iron *x* is mounted on the post directly below the L-iron *d*. Strut *e* is pivoted to the lower end of post *b* and carries at its other end a wooden beam *g*, secured by bolts *h*, by means of which the effective length of strut *e* can be adjusted to suit irregularities in the bed. To the upper parts of posts *a* and *b* are bolted angle-irons *i*, which carry the cross-beam *k*.

The means for securing the posts *a* and *b* in the rock, consists of a pipe *l*, made of soft material and slitted at several places in its lower end, its upper end being screwed onto the guide member *m*. The lower end of this pipe engages a conical wedge-member *n*, the extension or stem *o* of which runs to the upper edge of the posts *a* and *b* and is there provided with threads, on which screws a nut *f*, seated on the guide member *p*, which closes the top of said posts. The screw-stem or bolt *o* is enclosed in a pipe or sleeve *q*, which is screwed in the lower guide member *m* and engages the guide member *p* at the top. The supporting posts of the several frames are connected together by wooden beams *r*, secured thereto by two channel-iron sections *s* at each post. To the beams *r* the wooden sheathing is nailed, as usual. To the legs of the channel sections, which contact the post, are bolted clamp plates *t*, which serve to locate and secure them. The posts *a* are provided, in their lower halves, with angles *u*, which serve, when necessary, to support the same by wooden braces.

Figures 7 to 9 show the jig frame Z which serves to set the posts in their correct position on the river bed and to hold them against the current until they are secured

in the bed. The jig frames Z are secured to posts *a* and *b* already set in place, by clamp bolts *v*, and extend beyond the location of the next two posts to be set. On the free sides, they are provided with guides *w* to receive the fresh posts. The letter *a* appearing on Fig. 7 designates the relative positions of the supporting posts *a* when the jig frame Z is utilized in setting the posts.

Fig. 10 illustrates the erection of a dam in accordance with the present invention. First, two suitably high frames are erected on the bank and the top members thereof are provided with a railway track, on which is mounted a suitable crane. Then the jig frames of Figs. 7 to 9 are secured to the posts *a* and *b*, already set on the up and down stream sides, by the clamp bolts *v*, so that the guides *w*, carried by said frames, extend to the next pair of posts to be set. The posts, longitudinal cross beams, etc., for the next frame, are now conveyed on small cars in the sequence in which they are needed and are laid on the platform of the crane. From this is first taken by the crane the post *a* and it is placed in the guide *w* of the jig-frame on the up-stream side, and lowered onto the river bed. Then the pipe *q*, for guiding the drill, is set in the post *a* and the hole to receive the securing means is drilled in the bed. After the pipe is removed, the securing means is placed therein. By tightening the nut *f*, the conical wedge *n* is forced into the lower end of pipe *l*, Fig. 6, whereby the post is firmly anchored in place. During the drilling of the hole and the insertion of the securing means of post *a*, the crane places the post *b* in the guide of the jig-frame on the down-stream side, and the same procedure is followed. At the same time, the upper cross-beams *k* and the angles *i* are mounted in place, and the track is extended the requisite distance. These operations are repeated until all the frames of the dam are set up. The sheathing is applied in the usual way. If the dam is to be removed, the cross-beams *e* and *k* are first disconnected, then the nut *f* is loosened and the conical wedge member is driven out of the pipe *l* by hammering on the nut. The disassembling can thereafter be performed by the crane.

What is claimed is:

1. In a cofferdam structure, a frame comprising a plurality of spaced supporting posts provided with openings extending through their entire length, and means mounted in said openings for fixedly anchoring said posts, said means comprising a pipe section having its lower end slit and a wedging member extending through said pipe section adapted to expand the slit end of said pipe section as the said member is moved relative to the said section.

2. In a cofferdam structure, a frame comprising spaced supporting posts provided with openings extending through their entire length, struts pivotally mounted and carried by one of said posts and adapted to bear against the surface of the adjacent post, and means mounted in said openings for fixedly anchoring said posts, said means comprising a pipe section having its lower end slit and a wedging member extending through said pipe section adapted to expand the slit end of said pipe section as the said member is moved relative to the said section.

3. In a cofferdam structure, a frame comprising spaced supporting posts provided with openings through their entire length, pipes mounted within the said openings, and means mounted in said pipes for fixedly anchoring said posts, said means comprising guide members mounted at the top and bottom of said pipe, a threaded member having an enlarged wedge shaped lower end extending through the said guide members and pipe, a pipe section having its lower end slit surrounding the wedge shaped end of said member, and a nut engaging the threaded end of said member and bearing against the upper guide member.

4. In a cofferdam structure, a frame comprising spaced supporting posts provided with openings extending through their entire length, pipes mounted within the said openings, and means mounted in said pipes for fixedly anchoring said posts, said means comprising guide members mounted at the top and bottom of said pipe, a sleeve surrounding said pipe and mounted between the said guide members, a threaded member having an enlarged wedge shaped lower end extending through said guide members and sleeve, a pipe section having its lower end slit surrounding the wedge shaped end of said member, and a nut engaging the threaded end of said member and bearing against the upper guide member.

5. A cofferdam adapted to be erected in rock beds comprising iron frames arranged in spaced rows, and sheathing secured to said frames, each frame comprising a plurality of supporting posts provided with openings extending through their entire length, pipes mounted within the said openings, and anchoring means mounted within said pipes for fixedly securing the said posts to the bed, said means comprising a pipe section having its lower end slit and a wedging member extending through said pipe section adapted to expand the slit end of said pipe section as the said member is moved relative to the said section.

In testimony whereof, I hereunto affix my signature.

KARL SCHOEN.