M. HALEY.

CLAMP FOR LIFTING STONES.

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Fig. 1.

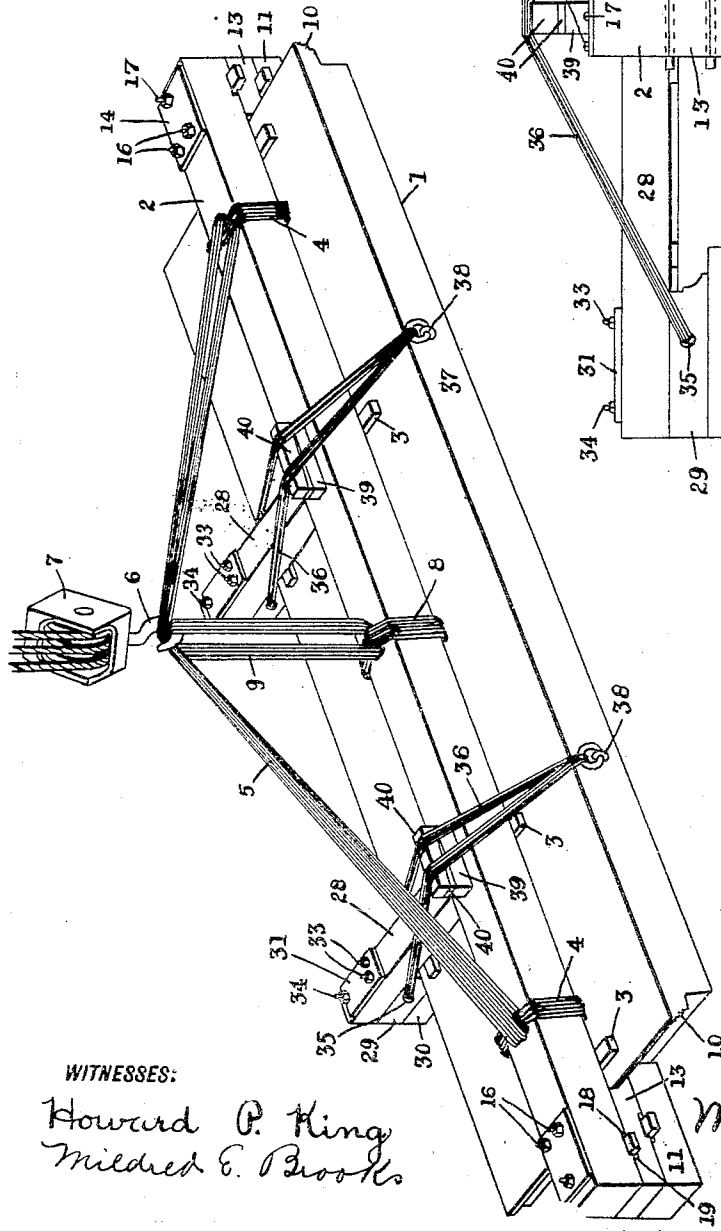


Fig. 2.

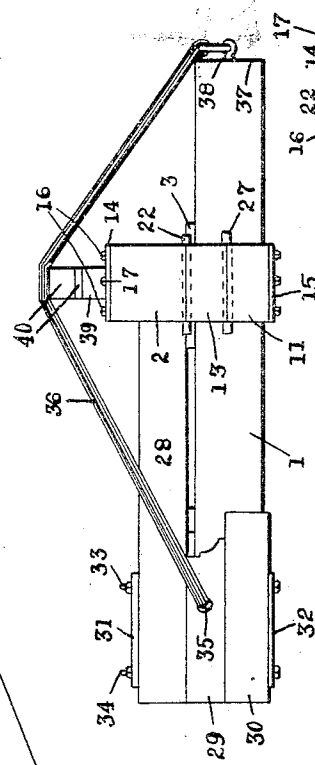
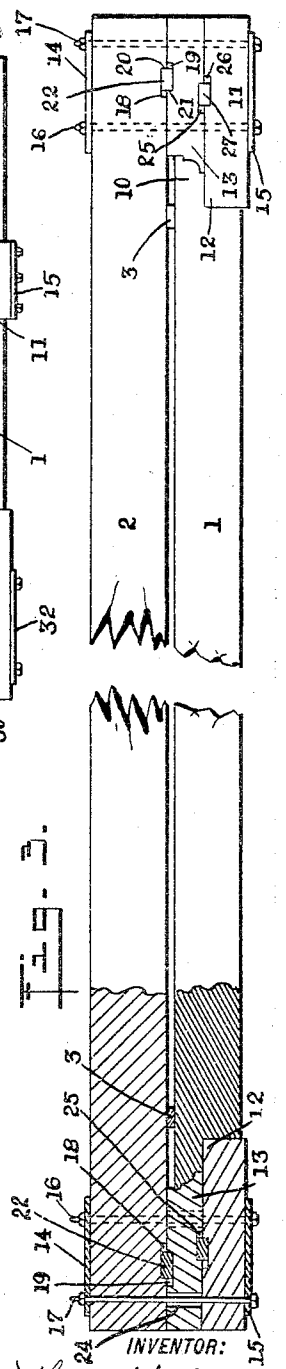


Fig. 3.



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To all whom it may concern:

Be it known that I, MATTHEW HALEY, a citizen of the United States, and a resident of Barre, in the county of Washington and State of Vermont, have invented certain Improvements in Clamps for Lifting Stones, of which the following is a specification.

The objects of this invention are to provide means by which a finished stone, as for example the roof stone of a mausoleum, can be lifted into place with its bottom entirely exposed and free from lashings or the like and without cutting into or marring in any way its finished edges and top; to thus enable the stone to be placed directly in its final position by a single lift, and the lifting means readily released; to thus avoid raising the stone to the top of the mausoleum by lifting means which prevent it dropping into final position and therefore necessitate lowering the stone in some other way to its final position; to secure a simple clamp which shall be strong and unyielding, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings in which like numerals of reference indicate the same parts throughout the several views, Figure 1 is a perspective view of my invention in use; Fig. 2 is an end view of the same, and Fig. 3 is a longitudinal section.

In said drawings, 1 indicates a roof-stone of a mausoleum being lifted by the use of my improved clamp, and in the arrangement of parts illustrated a beam or heavy stick of timber 2 lies lengthwise of the stone 1, at its top and along the median line thereof, said beam being spaced from the stone as by blocks 3, so as to get lifting cables beneath it. Near the ends of the stone, windings 4, 4, as of wire rope or the like, extend around the said beam 2, and from these windings 4, 4 a lashing 5, also of wire rope or the like, extends upward over the hook 6 of a block 7 of a derrick or other suitable lifting device (not shown). I have also shown a middle winding 8 around the beam 2 and a lashing 9 extending therefrom over the hook 6, for greater strength, but it will be understood that this could be dispensed with. Furthermore, the lashing 5 does not have to be secured to the beam 2 by the windings 4, 4, but could be otherwise secured in any way adapted to the purpose, and in fact it will be understood that the precise manner of getting hold of the beam 2 to lift the stone is not an essential part of my invention.

At the ends of the stone 1 its edges are cut or shaped to form a projecting molding for the roof, as at 10, and although the precise form of this molding varies in different stones there is always an undercut of some kind. I therefore place beneath the end of the beam 2 a lower block 11 whose end engages under the over-hanging molding 10 as at 12, and then fill the space between said lower block 11 and the beam 2 by an intermediate block 13 which may either simply abut against the edge of the molding or be cut and fitted thereto as I have shown in the drawing. The latter is preferable when there is some over-hang to this edge of the molding which can thus be taken advantage of. Preferably the lower block 11 projects under the molding 10 as far as possible, or so as to abut against the body of the stone as I have shown.

It will be understood that many of the stones to be lifted by my improved clamp are extremely large and heavy, one recently having been thirty-eight feet long by ten feet two inches wide and a foot and a half thick, weighing fifty-two tons, and that therefore the strain tending to cause the blocks 11, 13 to slip or spring out from under the molding 10 is very great. It is to meet this strain and to prevent the blocks 11, 13 from yielding longitudinally that I employ the means next to be described.

Plates 14, 15 are preferably laid upon the top of the ends of the beam 2 and underneath the lower blocks 11, and heavy bolts passed therethrough, these bolts being of any suitable number and arrangement, although for purposes of illustration I have shown at each end of the beam 2 two bolts 16 closely adjacent to the edge of the stone and one bolt 17 nearer the end of the beam, sufficient space being left between the said bolts 16, 16 and the bolt 17 for the wedges next to be described. Within said space, the under surface of the beam 2 is transversely channeled or recessed as at 18, and the upper surface of the intermediate block 13 is similarly channeled or recessed as at 19, the two chan-

nels or recesses partly overlapping, but the one in the beam extending farther toward the stone than the other one, and said other one in the intermediate block extending farther away from the stone than the one in the beam. The beam and intermediate block thus present exposed shoulders 20, 21 extending transversely of the clamp and spaced from each other in substantially parallel relation. A wedge 22 is then inserted between said shoulders 20, 21, said wedge being thick enough to practically fill the space between the beam 2 and intermediate block 13 and having at its lateral edges a slight taper so as to engage the said shoulders when inserted only a small portion of its length. Thus by driving the said wedge forcibly inward, it is apparent that the intermediate block 13 will be forced toward the stone 1, and furthermore it will be seen that said intermediate block cannot move away from said stone by any possibility. The wedge 22 is preferably made of hard wood, the beam 2 and the blocks 11, 13 being naturally of softer wood, and the shoulders 20, 21 are heavy enough to withstand the strain upon them. The strain of longitudinal shifting of the block 11 is therefore removed from the bolts 16, 17, and said bolts have only to carry a longitudinal strain upon them. In fact, the intermediate block 13 is preferably provided with holes 24 for the said bolt which are enough larger than the said bolts so that the block does not bear against them at all.

The intermediate block 13 and lower block 11 have recesses 25, 26 in their adjacent faces similar to the recesses 18, 19 already described, and a wedge 27 is similarly inserted between said intermediate block and lower block so that the lower block cannot shift longitudinally away from the stone. This construction being the same as that already described, is thought not to need further description here. Obviously when the two wedges 22, 27 are in place neither the intermediate block nor the lower block can move longitudinally away from the stone with respect to the beam 2. Preferably in applying my clamp the nuts of the bolts 16, 17 are first screwed down enough to draw the parts together but not so tightly as to prevent relative movement, and then the wedges 22 and 27 are driven into final position; afterward the bolts 16, 17 are tightened up completely.

It will be understood that the clamp engages the two ends of the stone in the same manner, at opposite ends of the beam 2, as shown in the drawing, and if a stone is narrow and not too large this is sufficient to lift it. However, if the stone is very wide it is necessary to have transverse clamps, either one or more according to the length of the stone. In the present instance illustrated in the drawing I have shown two transverse clamps, arranged as follows: At the edge of the stone 1 along which the molding 10 is continued I apply an auxiliary clamp consisting of a beam or timber 28 laid on top of the stone transversely thereof and projecting beyond the edge with its inner end preferably abutting the beam 2, and beneath the outer end of this beam 28 I place an intermediate block 29 and a lower block 30 disposed with respect to the beam 28 and the edge molding of the stone just as the blocks already described herein. On top of the beam 28 and below the lower block 30 are plates 31, 32 and bolts 33, 34 extend therethrough similar to the bolts 16, 17 before described herein. It is usually unnecessary to insert wedges between the beam 28 and blocks 29, 30, although I might do so if desired as I have already described, but it is generally sufficient to aperture the intermediate block 29 just outside the pair of bolts 33, 34 as at 35, and pass therethrough several strands of wire rope or cable 36 which extends over the beam 2 to the opposite edge of the stone. In the present case which I have illustrated in the drawing, said opposite edge 37 merely makes a joint with the next stone on the mausoleum roof and is not finished like the other three edges, so that a clevis 38 can be inserted in said edges and the cable 36 run through the ring thereof. It is obvious, however, that if the stone had opposite molded edges that a second auxiliary clamp could be used like the one I have described in detail, and arranged opposite thereto. I have shown a block 39 on top of the beam 2 and wedges 40 driven in upon said block beneath the cable 36 to tighten the same and draw the auxiliary clamp close to the stone.

While the wedges 23, 27 are preferably tapered slightly as I have stated, it will be seen that they would answer their purpose to an operative extent if they were not tapered at all, and I wish it to be understood that I have used the word "wedge" in a sense broad enough to cover them either tapered or not tapered. Furthermore, it will be seen that the intermediate block 13 does not necessarily have to engage the molding of a stone, but could be short enough to not touch the molding and the lower block 11 depended upon for engagement with the molding.

By my invention a roof stone for a mausoleum can be lifted from the ground and deposited in its final position by a single lift, and without the difficulties incident to lifting means which extend beneath the under surface of the stone or surface upon which it will rest when in place; such surfaces of the stone are entirely and freely

exposed by my clamp and obviously if desired the blocks 13 at the ends of the stone may depend a less distance than the thickness of the stone. Various other detail modifications may be made without departing from the spirit and scope of the invention and I do not wish to be understood as limiting myself except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:

1. In a clamp of the character described, a beam adapted to lie at the top of the stone and project over an undercut edge thereof, a block beneath said projecting end of the beam adapted to engage the undercut edge of the stone, said block and beam having at their facing sides opposed transverse shoulders, means between said block and beam for engaging said shoulders and preventing longitudinal movement of the block with respect to the beam, and means for securing said beam and block together.

2. In a clamp of the character described, a beam adapted to lie at the top of a stone and project over an undercut edge thereof, a block beneath said projecting end of the beam adapted to engage the undercut edge of the stone, said block and beam having in their adjacent faces transverse recesses partly overlapping each other, the recess in the beam extending nearer the stone than the recess in the block and the recess in the block extending farther from the stone than the recess in the beam, a wedge in said recess engaging the exposed adjacent edges thereof, and means for securing said beam and block together.

3. The hereindescribed clamp for lifting stone, comprising in combination a beam adapted to lie at the top of a stone and project over an undercut edge thereof, a block beneath said projecting end of the beam engaging the undercut edge of the stone, said block and beam having their facing sides transversely recessed, means for clamping said beam and block together, means between said block and beam projecting into said recesses and preventing longitudinal movement of the block with respect to the beam, and means for attaching a lifting device.

4. The hereindescribed clamp for lifting stone, comprising in combination a beam adapted to lie at the top of the stone and project over an undercut edge thereof, a block beneath said projecting end of the beam engaging the undercut edge of the stone, said block and beam having at their facing sides transverse shoulders exposed by recessing, means for clamping said beam and block together, means between said block and beam for engaging said shoulders and preventing longitudinal movement of the block with respect to the beam, and means for attaching a lifting device.

5. The hereindescribed clamp for lifting stone, comprising in combination a beam adapted to lie at the top of a stone and project over an undercut edge thereof, a block beneath said projecting end of the beam, said block and beam having in their adjacent faces transverse recesses partly overlapping each other, the recess in the beam extending nearer the stone than the recess in the block and the recess in the block extending farther from the stone than the recess in the beam, a wedge in said recess, and means for attaching a lifting device.

6. The hereindescribed clamp for lifting stone, comprising in combination a beam adapted to lie at the top of a stone and project over an undercut edge thereof, a lower block beneath said projecting end of the beam engaging the undercut edge of the stone, an intermediate block between said lower block and the beam, each block and the part next above it having overlapping transverse channels or recesses, means for clamping said beam and blocks together, wedges one above each block in the said recesses, and means for attaching a lifting device.

7. In a clamp of the character described, a beam adapted to lie at the top of the stone and project over an undercut edge thereof, a block beneath said projecting end of the beam adapted to engage the undercut edge of the stone, said block and beam having at their facing sides opposed transverse shoulders, means between said block and beam for engaging said shoulders and preventing longitudinal movement of the block with respect to the beam, means for securing said beam and block together, and means for attaching a lifting device to said block below the top of the stone.

8. The hereindescribed clamp for lifting stone, comprising in combination a beam adapted to lie at the top of a stone and project over opposite undercut edges thereof, means upon the projecting ends of said beam for engaging beneath the undercut edges of the stone and leaving the under surface of the stone exposed, an auxiliary beam at one side of the first-mentioned beam projecting over an undercut side edge of the stone, means upon said projecting end of said auxiliary beam for engaging beneath said undercut edge of the stone and leaving the under surface of the stone exposed, means binding the auxiliary clamp to the main beam, and means for attaching a lifting device.

9. In a clamp of the character described, a beam adapted to lie at the top of a stone longitudinally thereof, an auxiliary beam at

the top of the stone at one side of the first-mentioned beam transverse thereto and projecting over an undercut side edge of the stone, means upon the projecting end of said auxiliary beam for engaging beneath said undercut edge of the stone and leaving the under surface of the stone exposed, means securing said auxiliary beam to the main beam, and means for attaching a lifting device to said main beam.

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