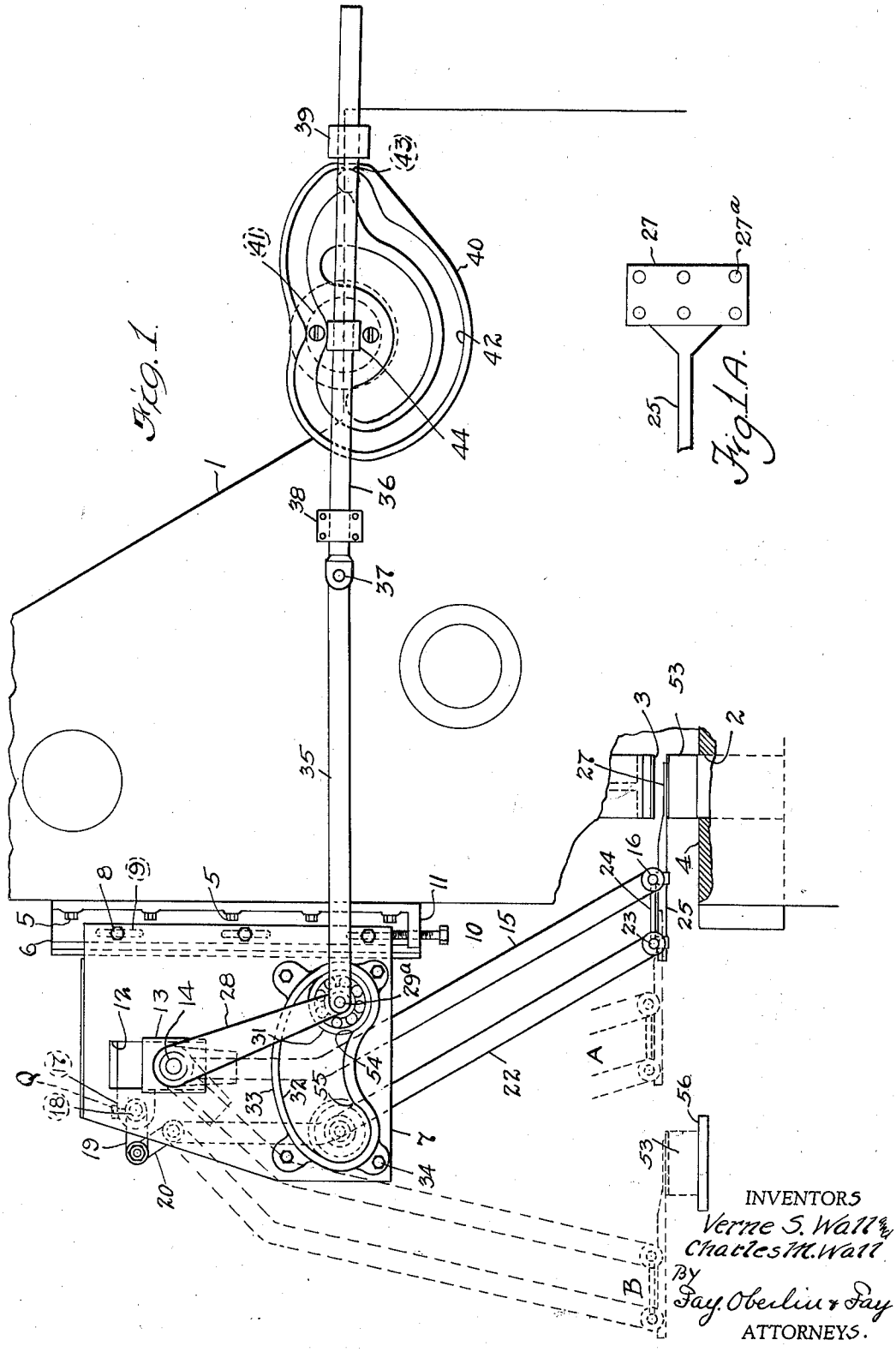
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BRICK TRANSFERRING APPARATUS

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BRICK TRANSFERRING APPARATUS

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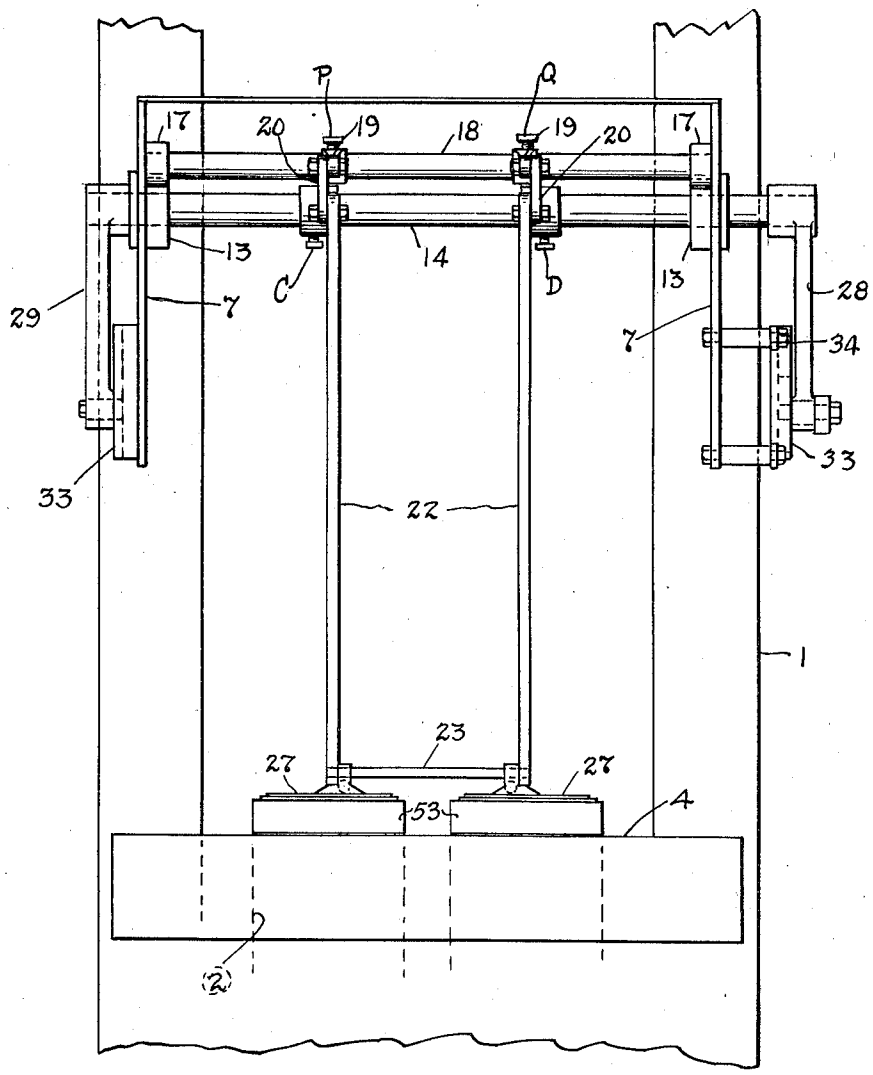


Fig. 2

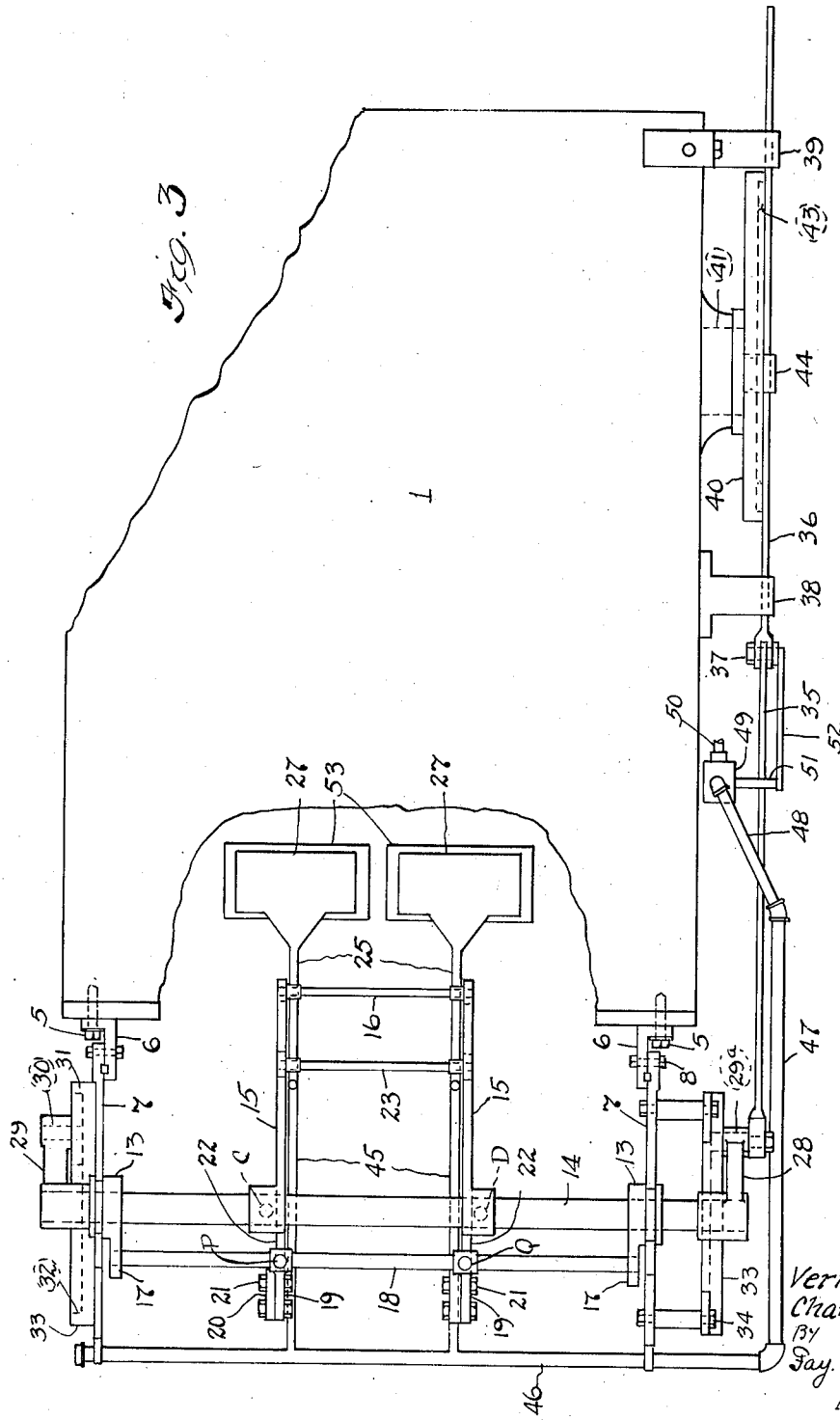
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Fig. 3



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BRICK TRANSFERRING APPARATUS

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13 Claims. (Cl. 25—1)

This invention relates as indicated to brick handling apparatus, but has reference more particularly to apparatus of this character which is especially adapted for transferring green bricks from the presses in which they are molded to a pallet or other support for further treatment of the bricks, such apparatus being capable, however, of being used for conveying other fragile products.

It is the practice, at the present time, after the bricks have been ejected from the mold cavities in which they have been pressed into the desired form, to push the bricks to an apron extending from the front of the press table from which the bricks are then pushed or carried to pallets for drying, baking or other treatment. The bricks, after being ejected from the molds, are usually in such a condition that they cannot withstand any considerable amount of mechanical handling without having their corners or edges broken off or the surface thereof marred or otherwise damaged, such injuries resulting particularly from the mere operation of pushing the bricks towards the front of the press table. Occasionally, where waste material has accumulated on the press table or apron, the injuries resulting from pushing the bricks are apt to be aggravated.

The present invention, accordingly, has as its primary object the transfer of the bricks from the dry presses or other machines in which they are molded to a pallet or other support without in any manner injuring the bricks.

Another object of the invention is to provide an apparatus for this purpose which may be readily applied to existing types of brick presses without consequential changes or alteration thereof, which will be effective to transfer bricks from the press to the pallet without injury to the bricks and which is adapted to be operated by the press operating mechanism, thereby dispensing with the use of independent operating mechanism for the brick transferring apparatus and enabling such apparatus to be easily operated in synchronism with the press molding operations. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a side elevation of the brick transferring apparatus as applied to conventional types of brick presses; Fig. 1A is a detail plan view taken from below of the vacuum pad 27; Fig. 2 is a front elevation of the apparatus; and Fig. 3 is a plan view of the apparatus.

Referring more particularly to the drawings, the brick transferring apparatus is shown in combination with a brick press 1. The brick press is of a conventional type wherein the bricks are molded by charging the clay in regulated amounts into the mold cavities 2 and upon lower die plates (not shown), and pressing the charges by means of upper die plates 3, the bricks thus formed being then ejected upwardly from the mold cavities to the surface 4 of the press table, from which they are subsequently removed.

Secured to the front of the press 1, as by means of screw bolts 5, are spaced brackets 6 which serve as supports for frame members 7, the frame members being secured to the brackets by means of clamp bolts 8, and the apertures in the brackets through which these bolts pass being in the form of elongated slots 9 whereby vertical adjustment of the frame members is permitted. Such adjustment is effected by means of adjusting screws 10 which extend through lugs 11 of the brackets and into engagement with the lower edges of the frame members.

Mounted for vertical sliding movement in guide slots 12 in the members 7 are bearing blocks 13 in which is journalled a shaft 14. Rigidly secured to the shaft 14 are laterally spaced downwardly extending arms 15, the lower portions of which are bent in the direction of the press and are connected at their lower ends by a cross member 16.

The blocks 13 are provided at their upper ends with forwardly extending lugs 17, to which the ends of a shaft 18 are rigidly secured. Shaft 18 has secured thereto a pair of forwardly extending links 19, to which in turn are rigidly secured links 20. Pivotally secured to the links 20 as by bolts 21 are arms 22 which are similar to arms 15 and extend parallel therewith, being interconnected at their lower ends by a cross member 23 similar to the cross member 16. The cross members 16 and 23 are interconnected by means of transversely spaced links 24 and support tubular members 25 which terminate in pads 27, having perforations 27a.

The blocks 13, links 19 and 20 and arms 15 and 22 constitute a pantograph which as will be later apparent is adjustable to facilitate the handling of bricks of various shapes.

The shaft 14 has splined on its ends cranks 28 and 29 which are respectively provided at their other ends with bearing pins 29a and 30, each of which has mounted thereon a ball bearing roller 31. Rollers 31 are disposed in substantially arcuate cam grooves 32 of cam plates 33 which are rigidly secured as by bolts 34 to the frame member 7. The crank 28 is adapted to be oscillated by suitable mechanism which includes a connecting rod 35 which is pivotally secured to the bearing pin 29a and a cam bar 36 which is pivotally secured as by means of a pin 37 to the rod 35 and is guided for linear or axial movement only in guide blocks 38 and 39 secured to the side of the press 1. Such movement is imparted to the cam bar by means of a cam 40 which is rigidly secured to the end of the crank shaft 41 of the brick press and has a cam slot 42 in which is disposed a roller 43 extending laterally from the cam bar. The cam bar 36 is also guided in its reciprocal movement by a guide block 44 which is pivotally connected to the cam 40 at its center of rotation and remains stationary during revolution of the cam.

Means are also provided for evacuating the pads 27. Such means comprises flexible conduits 45 which are connected at one end to the tubular members 25 and at their other ends to a rigid manifold 46 suitably supported by the frame members 7. Manifold 46 is closed at one end and is connected at its other end to a flexible conduit 47 which in turn is connected to a rigid conduit 48. Conduit 48 is connected to a valve mechanism 49 suitably secured to the side of the press, such valve mechanism being connected as by a conduit 50 to a vacuum tank (not shown). For the purpose of synchronizing the evacuation of the pads 27 with the operation of the brick transferring apparatus, the valve 51 of the valve mechanism 49 is adapted to be oscillated by a lever 52 which is pivotally secured to the pin 37 and is adapted to be oscillated upon reciprocation of the cam bar 36.

The operation of the brick transferring apparatus may now be briefly described as follows:

During the molding of the bricks in the manner hereinbefore described, the pads 27 are in the position indicated at A in Fig. 1, the rollers 31 being disposed at points intermediate the ends of the cam grooves 32. After the bricks designated 53 are ejected from the mold cavities 2 to the surface 4 of the press table and the upper die plates 3 have been raised clear of the bricks as shown in Fig. 1, the pads 27 are moved rectilinearly toward the press by the pantograph arms 15 and 22, the cam grooves 32 compensating for the arcuate path which would otherwise be taken by the pads during such movement. When the rollers 31 reach shoulders 54 in the lower edges of the cam grooves, they drop to the position shown in solid lines. This slight drop of the rollers permits the pads 27 to move downwardly a corresponding amount and into engagement with the bricks, the position of the pads being indicated in solid lines in Fig. 1. In this position the pads 27 overlie the bricks and the valve 51 of the valve mechanism is automatically opened to the vacuum tank, thereby exhausting the air from the pads and causing the pads to adhere to the bricks.

On return movement of the connecting rod 35, the pads 27, due to the movement of the rollers over the shoulders 54, are first lifted a slight distance and are thereafter moved rectilinearly away from the press. By initially lifting the bricks in this manner before carrying them away from the press, they are carried clear of the surface of the press table, thereby avoiding injury to the bricks which would result if they were pushed forwardly before being lifted. When the rollers reach shoulders 55 in the lower edges of the cam grooves, they drop to the position indicated by the dotted lines. This slight drop of the rollers permits the pads 27 to move downwardly a corresponding amount, depositing the bricks on a pallet or other support 56 for subsequent treatment. The final position of the pads is indicated at B. By depositing the bricks in this manner, we avoid the injury thereto which would result from pushing them on the pallet.

After the bricks are deposited on the pallet, the valve 51 is automatically closed, thereby releasing the bricks from the pads 27, which are thereafter returned to their initial position at A.

The pads 27 may be of any desired shape to correspond with the shape of the bricks which are being molded in the press. The vertical adjustment of the frame members 7 which has been previously described is for the purpose of adapting the use of the transferring mechanism to bricks of various thicknesses.

The arms 15 as well as the links 19 are adjustable along the shaft to which they are secured by some such means as set screws P, Q, C, D, thus providing an adjustment of the pads 27 transversely of the press.

In addition, the links 19 are adjustable circumferentially of the shaft 18 by the set screws P and Q or the like, and such adjustment is effective to tilt one end of the pads 27 downwardly or upwardly to thereby provide for proper positioning of the pads on arch or wedge shaped bricks.

It is thus apparent that we have provided a brick transferring apparatus which may be readily applied to existing types of brick presses without consequential changes or alteration thereof, which will be effective to transfer bricks from the press to the pallet or other support without injury or damage to the bricks and which is adapted to be operated by the press operating mechanism for the brick transferring apparatus and enabling such apparatus to be easily operated in synchronism with the molding operations of the press.

Although the brick transferring mechanism has been described in connection with a brick press of a conventional type, it will be readily apparent that it may be used with other types of brick presses or brick making machines and that it may also be used for handling and transferring products and articles other than bricks.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention:

1. Apparatus for transferring bricks from a brick molding apparatus to a point removed therefrom comprising suction means for gripping the bricks and means for moving said suction means to said point.

2. Apparatus for transferring bricks from a brick molding apparatus to a point removed therefrom comprising suction means for gripping the bricks and means for moving said suction means in a rectilinear path to said point.

3. Apparatus for transferring bricks from a

brick molding apparatus to a point removed therefrom comprising pads adapted to be applied to the molded bricks, means for evacuating the pads, to cause the bricks to adhere to the pads, and means for moving the evacuated pads to said point.

4. Apparatus for transferring bricks from a brick molding apparatus to a point removed therefrom comprising pads adapted to be applied to the molded bricks, means for evacuating the pads to cause the bricks to adhere to the pads, and means for moving the evacuated pads in a rectilinear path to said point.

5. Apparatus for transferring bricks from a brick molding apparatus to a point removed therefrom comprising parallel arms mounted for oscillating movement, pads supported by said arms and adapted to be applied to the bricks, and means for evacuating said pads.

6. Apparatus for transferring bricks from a brick molding apparatus to a point removed therefrom comprising parallel arms mounted for oscillating movement, pads supported by said arms and adapted to be applied to the bricks, means for evacuating said pads, and means for oscillating said arms to transfer the bricks from said apparatus to said point.

7. Apparatus for transferring bricks from a brick molding apparatus to a point removed therefrom comprising parallel arms, pads supported by said arms and adapted to be applied to the bricks, means for evacuating said pads and means for moving the lower ends of said arms in a rectilinear path to transfer the bricks from said apparatus to said point.

8. Apparatus for transferring bricks from a brick molding apparatus to a point removed therefrom comprising parallel pairs of arms terminating in a common horizontal plane, pads supported by said arms and adapted to be applied to the bricks, means for evacuating said pads, means for moving the lower ends of said arms in a rectilinear path to transfer the bricks from said apparatus to said point, and means for adjusting one pair of said arms relatively to the other pair to tilt the pads.

9. In apparatus of the character described, parallel pairs of arms, pads supported thereby, and means for simultaneously oscillating and vertically reciprocating said arms.

10. In combination, means for molding bricks, and means operating automatically and in synchronism with said molding means for initially lifting and thereafter transferring the bricks to a point removed from said molding means.

11. In combination, means for molding bricks, and suction means operating automatically and in synchronism with said molding means for initially lifting and thereafter transferring the bricks to a point removed from said molding means.

12. In combination, a brick press and operating means therefor, and means operated by said operating means and in synchronism therewith for initially lifting and thereafter transferring the bricks to a point removed from said molding means, said movement being characterized by a slow uniform speed.

13. In combination, a brick molding apparatus, and means for automatically removing the bricks formed therein from the position which they occupy at the termination of the molding operation to a point removed from said apparatus, said movement being at a slow uniform speed.

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