No. 721,789. PATENTED MAR. 3, 1903.

J. S. DUNCAN.

MACHINE FOR SAWING ICE INTO CUBES OR BLOCKS.

APPLICATION FILED APR. 21, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

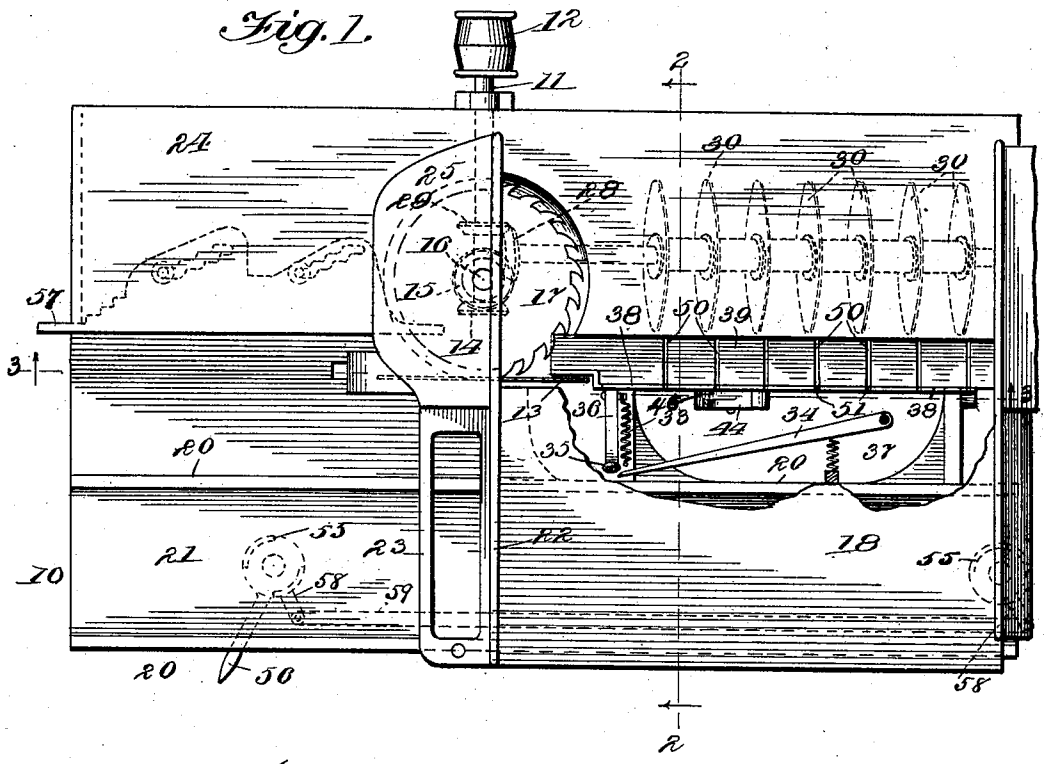


Fig. 5.

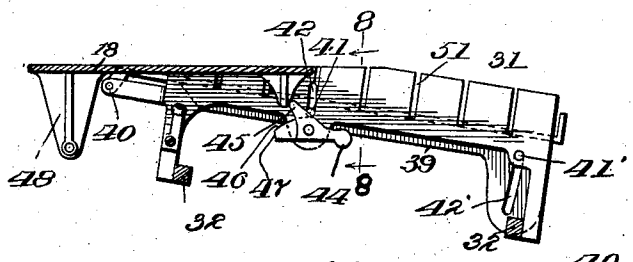


Fig. 8.

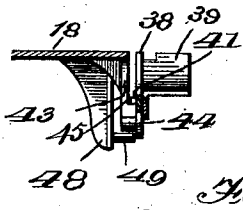


Fig. 6

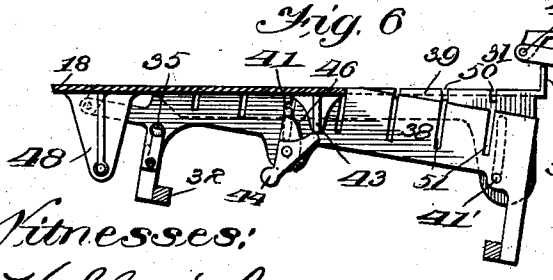
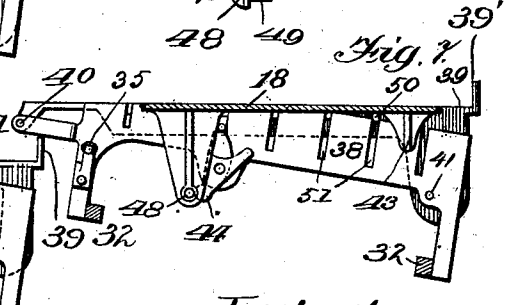


Fig. 7.



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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.

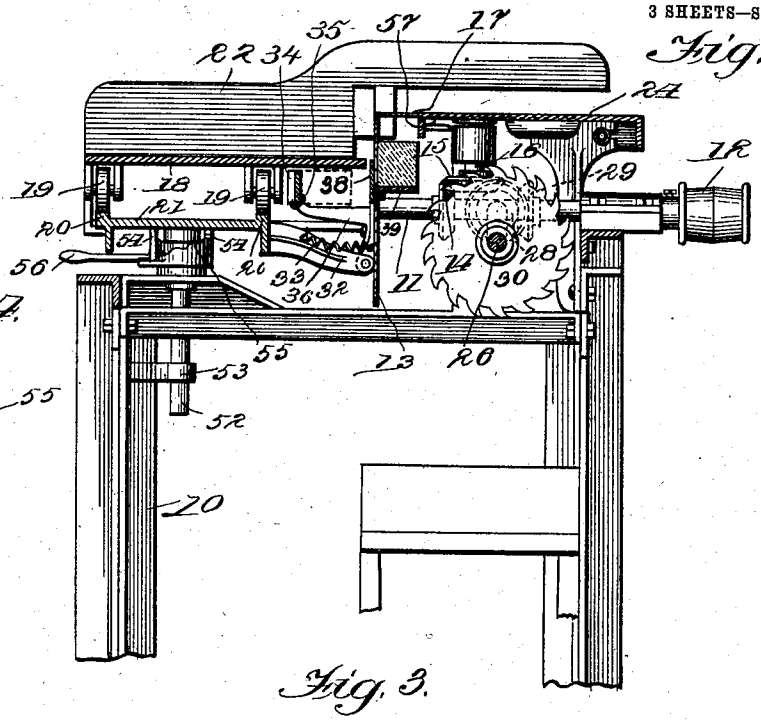


Fig. 4.

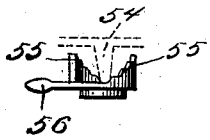
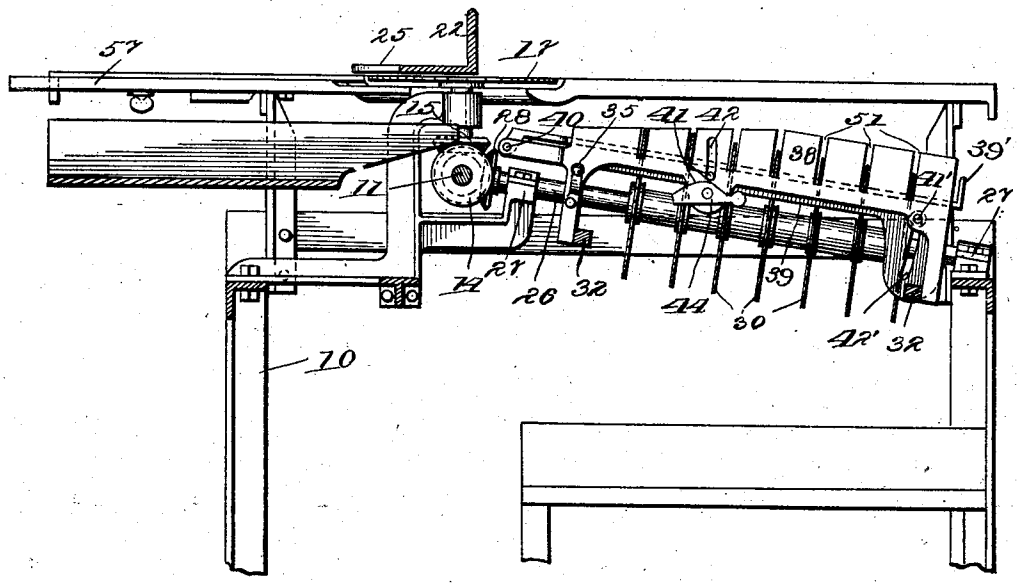


Fig. 3.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 9.

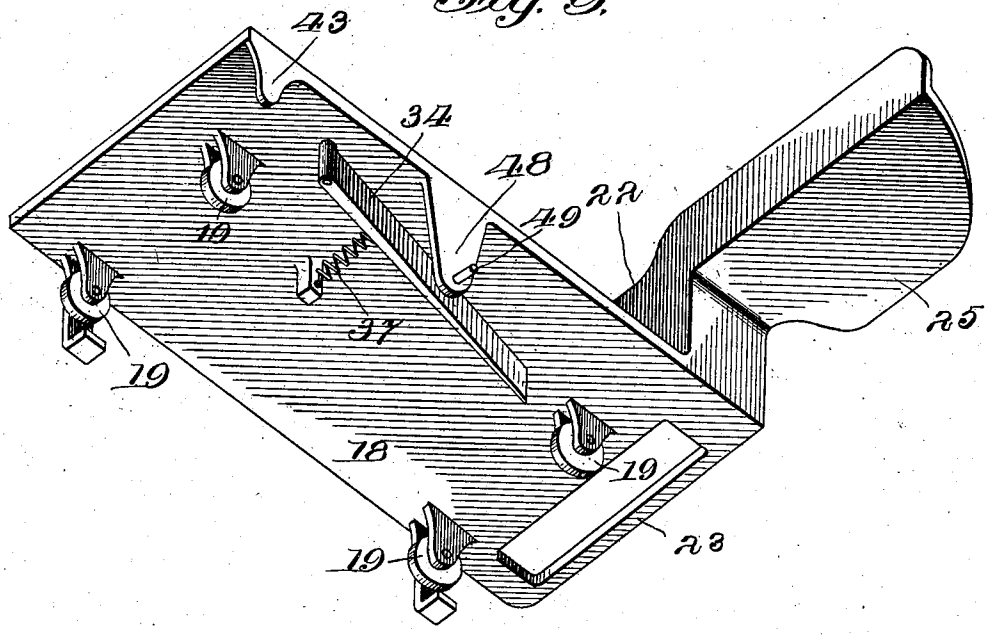
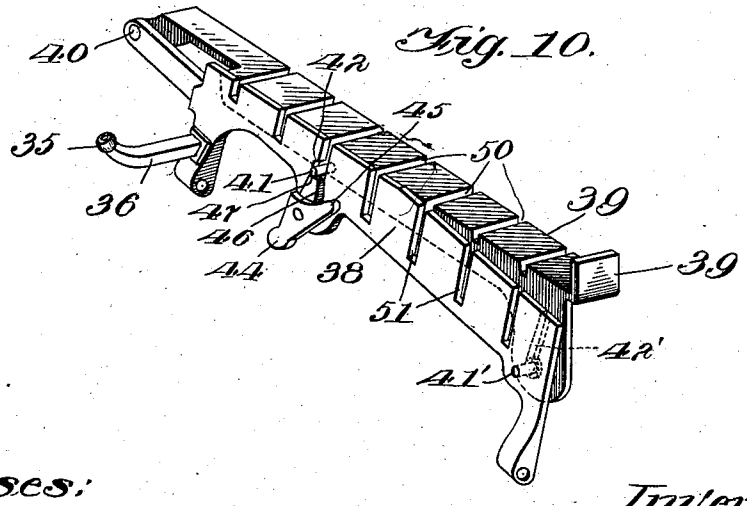


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOSEPH S. DUNCAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO ICECUBATOR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR SAWING ICE INTO CUBES OR BLOCKS.

SPECIFICATION forming part of Letters Patent No. 721,789, dated March 3, 1903.

Application filed April 21, 1902. Serial No. 104,015. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. DUNCAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Sawing Ice into Cubes or Blocks, of which the following is a specification.

This invention relates to machines of the general character disclosed in Letters Patent No. 694,260, dated February 25, 1902, for sawing ice into cubes or blocks for use in dispensing liquid refreshments, and has for its object to greatly increase the capacity of said patented machine and simplify its operation; and a further object is to make a machine of this character operate partly automatically, and thereby greatly reduce the handling of the ice.

The present invention also aims to simplify and improve the construction of a machine of this character and has other objects in view, which will appear fully hereinafter in the detailed description thereof.

In the accompanying drawings, Figure 1 is a top plan view of a machine embodying my invention, the carriage being partly broken away to show parts located thereunder. Fig. 2 is a transverse sectional view on the line 2 2 of Fig. 1. Fig. 3 is a longitudinal sectional view on the line 3 3 of Fig. 1. Fig. 4 is a detail view of the device for adjusting the table and carriage. Figs. 5, 6, and 7 are detail views illustrating the several positions of the tilting parallelepiped support. Fig. 8 is a sectional view on the line 8 8 of Fig. 5. Fig. 9 is a bottom view of the carriage in perspective. Fig. 10 is a perspective view of the support.

Referring to the drawings, in which like numerals of reference designate corresponding parts in the several figures, 10 designates a frame of any kind which is adapted to support and carry the operative parts of the machine. A main shaft 11 is journaled in bearings in the frame and is shown provided with a belt-pulley 12, whereby power can be communicated to the machine, although it will be understood that the machine may be operated by means of a hand-wheel or by a foot-treadle, if desired. The main shaft carries on its inner end an upright saw 13 and is provided with a bevel-gear 14, which meshes with a bevel-gear 15 on the saw-shaft 16, journaled in suitable bearings in the frame and carrying on its upper end the horizontal saw 17.

The carriage 18, which supports the large cake of ice to be divided, is provided with rollers 19, which ride on tracks 20 on a table 21, and the carriage is provided with an upright end guard 22, against which the cake of ice can be held, and a handle 23, whereby the carriage can be moved back and forth. The upright guard extends over the top plate 24 and is provided with a rearward extension 25 to protect the operator from the saws when the carriage is moved to its forward position.

In the machine of the patent heretofore mentioned the ice is first divided into parallelepipeds by saws arranged at right angles in a manner substantially similar to those just described, and then the parallelepipeds are collected and fed singly or in series to the same saws to be divided into small blocks or cubes. This necessitates handling the ice several times, and I have sought to avoid this and provide a machine which will operate automatically to a very large extent and produce small blocks or cubes of ice with only one handling. I provide a gang-saw shaft 26, which is journaled in suitable bearings 27 and carries a bevel-gear 28, which meshes with a similar gear 29 on the main shaft. This shaft carries a series of circular saws 30, which are adjusted to divide the parallelepiped sawed from the block by the upright and horizontal saws into blocks or cubes of predetermined size. The parallelepiped is received from the saws 13 17 on a tilting support 31, which is pivotally connected by arms 32 to the table 21; but it may be otherwise supported on the frame of the machine, if desired. The parallelepiped-support is held in upright position by a spring 33, Figs. 1 and 2, and it is thrown into tilting position by means of a wedge or lever 34, carried by the carriage, on the under side thereof, and arranged to engage a roller 35 on the end of an arm 36 on the support. When the carriage moves forward, the wedge or lever 34 will pass the roller 35 into the position shown in Fig. 1, being held under tension of the spring 37, and upon the re-

turn movement of the carriage the wedge 34 will engage the roller 35 and act thereon to tilt the holder and discharge the parallelepiped upon the saws 30.

The tilting support 31 comprises an upright member 38 and a movable horizontal member 39, the latter being pivoted at one end 40 to the upright member and provided with pins 41 41′, which are guided in slots 42 42′ in the upright member. The parallelepiped is delivered onto the horizontal member while the latter is in its elevated position, as shown in Fig. 6, and after it has been separated from the cake of ice the horizontal member is carried to its lowered position, as indicated in Fig. 5, the parallelepiped being held by the stop 39′, and then the entire support is tilted, as before described, to carry the parallelepiped into operative engagement with the saws 30. This is accomplished in the following manner: The carriage is provided on its under side with a downwardly-projecting lug 43, which is arranged to engage a pivoted pawl 45 and throw it from the position shown in Fig. 5 to that shown in Fig. 6. The pin 41 on the horizontal member 39 of the support projects through its slot in the upright member and is engaged by the cam 46 on one side of the pawl, so that when the latter is moved in the manner just described said cam will travel against the pin 41 and move the horizontal member 39 into its elevated position, and then this pin will rest upon the flattened upper end 47 of the cam, Fig. 6. The continued forward movement of the carriage will bring the downwardly-projecting lug 48, having the lateral projection 49, into engagement with the weighted end 44′ of the pawl and throw it back again into its normal position, as shown in Fig. 5, the cam 46 being carried with the pawl and permitting the pin 41 and the horizontal member 39 to fall by gravity into its lowered position. When the carriage is moved back to its initial position, the support is tilted, as before described, by the wedge, and the projecting lug 43 will ride over the pawl 44, which will be returned to its normal operative position, as shown in Fig. 5, by reason of its weighted end. The horizontal member of the support is thus permitted to remain in its lowered position until the lug 43 is moved forward with the carriage to engage and operate the pawl, as heretofore described. It will thus be observed that the horizontal member of the support is permitted to remain in its lowered and tilted position while the carriage is being returned to its initial position and for a sufficient length of time to permit the parallelepiped to be subdivided into blocks or cubes by the saws 30, and the operation of the parts is such that by the time the next parallelepiped is partly separated from the cake of ice the horizontal member of the support will have been carried into elevated position to receive the same. The horizontal member of the support is provided with slots 50 to receive the saws 30, and the upright member is also provided with slots 51 for the same purpose, so that the support can be forced by the wedge 34 to carry the parallelepiped into such operative engagement with the saws 30 as will produce a complete subdivision thereof. By the time the carriage is at its initial position the wedge will have passed the roller on the end of the arm 36, and the spring 33 can then return the support to its upright position, ready to receive the next parallelepiped.

The table 21 is provided with upright standards 52, which are guided in brackets 53 in the frame, and adjacent to the standards I provide lugs 54 on the under side of the table, which are arranged to ride on the waved or cam wheels 55, the latter being provided with arms 58, connected by a link 59, and a handle 56, by which they are operated to raise and lower the table as required to set the parts for sawing a parallelepiped of the desired thickness. The block of ice is adjusted on the carriage against a side guide 57, supported on the under side of the top plate 24 and adapted to be adjusted laterally to regulate the width of the parallelepiped to be separated from the block of ice.

A machine constructed in accordance with my present invention can be operated with considerable rapidity and will deliver the ice in the form of blocks of a predetermined size, and it requires only one handling of the ice. The machine will be found of special value in hotels and large restaurants where a great number of blocks of ice are required.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination with one set of saws for cutting a section from a cake of ice, of a series of saws for dividing the section into small blocks, a carriage for carrying the cake of ice and moving the section forward to the series of saws, and means for operating the saws.

2. In a machine of the character described, the combination with one set of saws for cutting a section from a cake of ice, of a second set of saws for dividing said section into small blocks, means for receiving the section from the first set of saws and delivering it to the second set of saws, and a carriage for carrying the cake of ice and moving the section forward onto said receiving means.

3. In a machine of the character described, the combination with a pair of saws arranged at right angles to each other for cutting a section from a cake of ice, of a series of parallel saws arranged to operate at right angles to the pair of saws, and means for operating the saws simultaneously.

4. In a machine of the character described, the combination with means for cutting a section from a cake of ice, of a support to receive the section, a movable member forming part of said support and upon which the section

rests, a series of saws for dividing said section into small blocks, and means for actuating said support to carry the section into operative engagement with said series of saws.

5. In a machine of the character described, the combination with means for cutting a section from a cake of ice, of a support arranged in a substantially horizontal plane to receive the section as it is cut from the cake, means for lowering one end of said support, a series of saws for dividing said section into small blocks, and means for delivering the section to the series of saws.

6. In a machine of the character described, the combination with means for cutting a section from a cake of ice, of a support to receive the section, a movable member forming part of said support and upon which the section rests, a series of saws for dividing said section into small blocks, means for actuating said movable member to receive the section and lower it into position for operative engagement with said series of saws, and means for tilting said member to carry the section to said series of saws.

7. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a traveling carriage for supporting and carrying the cake of ice into operative engagement with the saws, a series of saws for subdividing the section into small blocks, means adjacent to the path of travel of the carriage for receiving and supporting the section of ice after it is separated from the cake, and devices operated by the carriage for operating said means to deliver the section into operative engagement with the series of saws.

8. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for supporting and carrying the cake of ice into operative engagement with said saws, a series of saws for subdividing the section into small blocks, a support for receiving the section, and means operated by said carriage for tilting the support to deliver the section into operative engagement with the series of saws.

9. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for supporting and carrying the cake of ice into operative engagement with said saws, a series of saws for subdividing the section into small blocks, a support for receiving said section and comprising a vertically-movable member, and means operated by the carriage for tilting the support to deliver the section into operative engagement with the series of saws.

10. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for supporting and carrying the cake of ice into operative engagement with said saws, a series of saws for subdividing the section into small blocks, a support for receiving said section and comprising a movable member pivoted at one end and upon which the section rests, means for holding said movable member in elevated position to receive the section and then lowering said member to carry the section into position for operative engagement with the series of saws, and means operated by the carriage for tilting the support to deliver the section to the series of saws.

11. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for supporting and carrying the cake of ice into operative engagement with said saws, a series of saws for subdividing the section into small blocks, a support for receiving said section, an arm fastened to said support, and a wedge carried by the carriage and arranged to engage said arm to tilt the support to deliver the section to said series of saws.

12. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for supporting and carrying the cake of ice into operative engagement with said saws, a series of saws for subdividing the section into small blocks, a support for receiving said section and comprising a movable member upon which the section rests, a pawl carried by said support, lugs on the carriage arranged to operate the pawl, and means controlled by the pawl for raising and lowering said movable member.

13. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for supporting and carrying the cake of ice into operative engagement with said saws, a series of saws for subdividing the section into small blocks, a support for receiving said section and comprising a movable member upon which the section rests, a pawl carried by said support, lugs on the carriage arranged to operate the pawl, a pin on the movable member, a cam rigid with the pawl and in engagement with said pin and having a flattened upper end on which the pin rests when the cam is in upright position, and means for releasing said pin from the flattened end of the cam.

14. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for supporting and carrying the cake of ice into operative engagement with said saws, a series of saws for subdividing the section into small blocks, a support comprising a movable member, a pawl-and-cam device carried by said support, lugs on the carriage for throwing the pawl to cause the cam to raise and lower said movable member, an arm on the support, and a wedge on the carriage for engaging said arm to tilt the support.

15. In a machine of the character described, the combination with saws for cutting a section from a cake of ice, of a carriage for car-

rying the cake of ice, a table for supporting the carriage, and means for adjusting the table and carriage to regulate the thickness of the section to be cut from the cake of ice and comprising standards guided in the frame of the machine and supporting the table, waved cam-wheels, and lugs on the bottom of the carriage arranged to ride on said cam-wheels.

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