

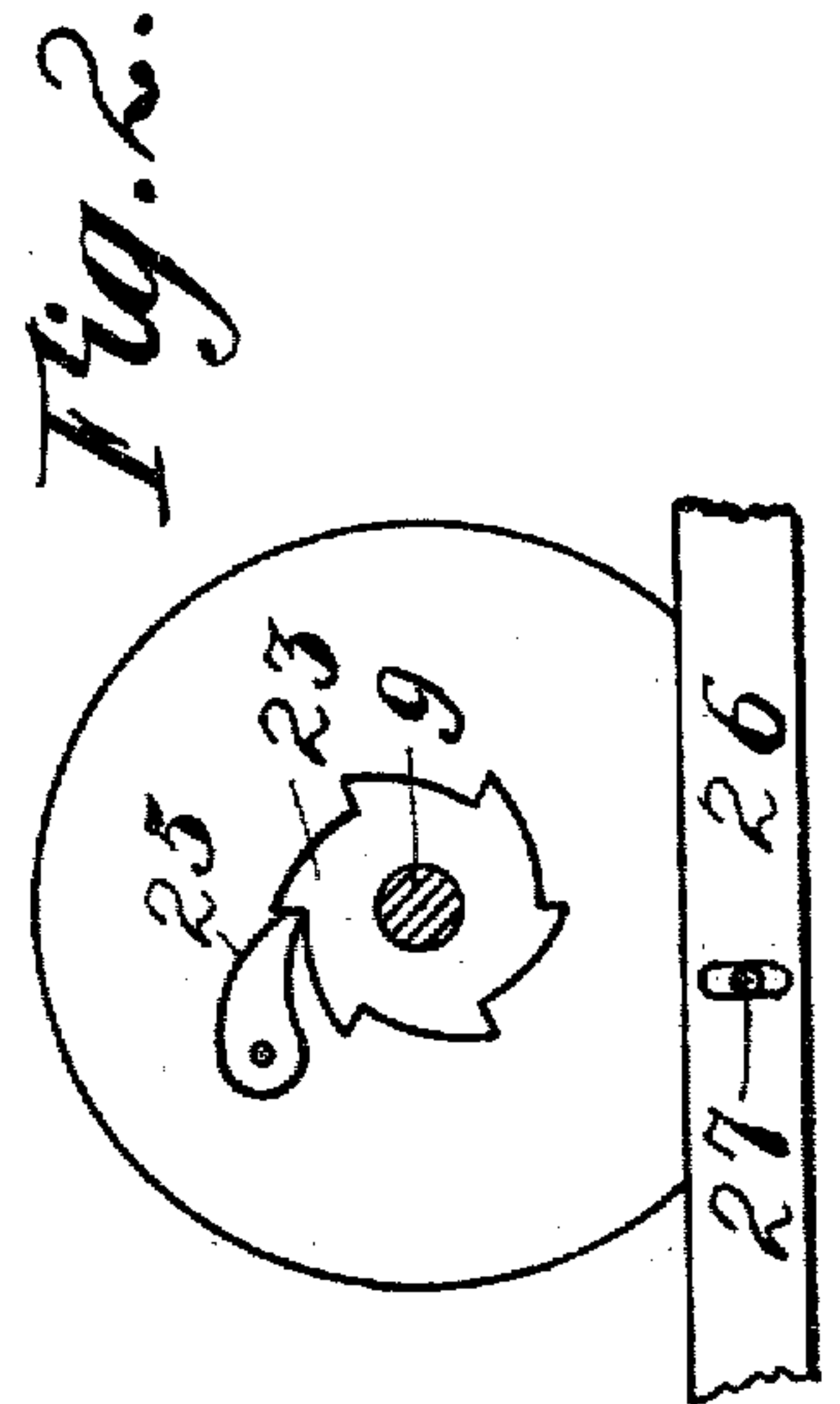
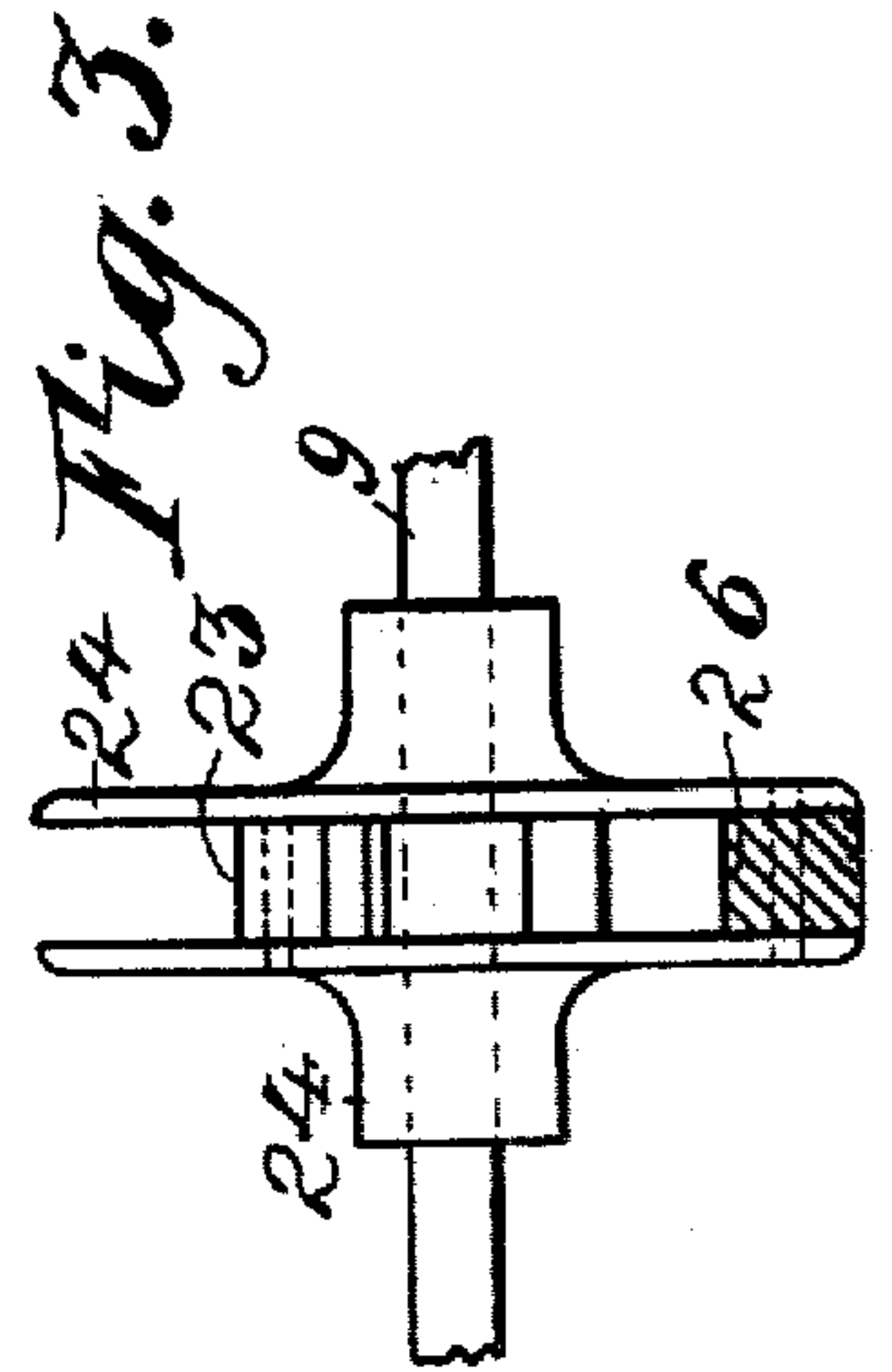
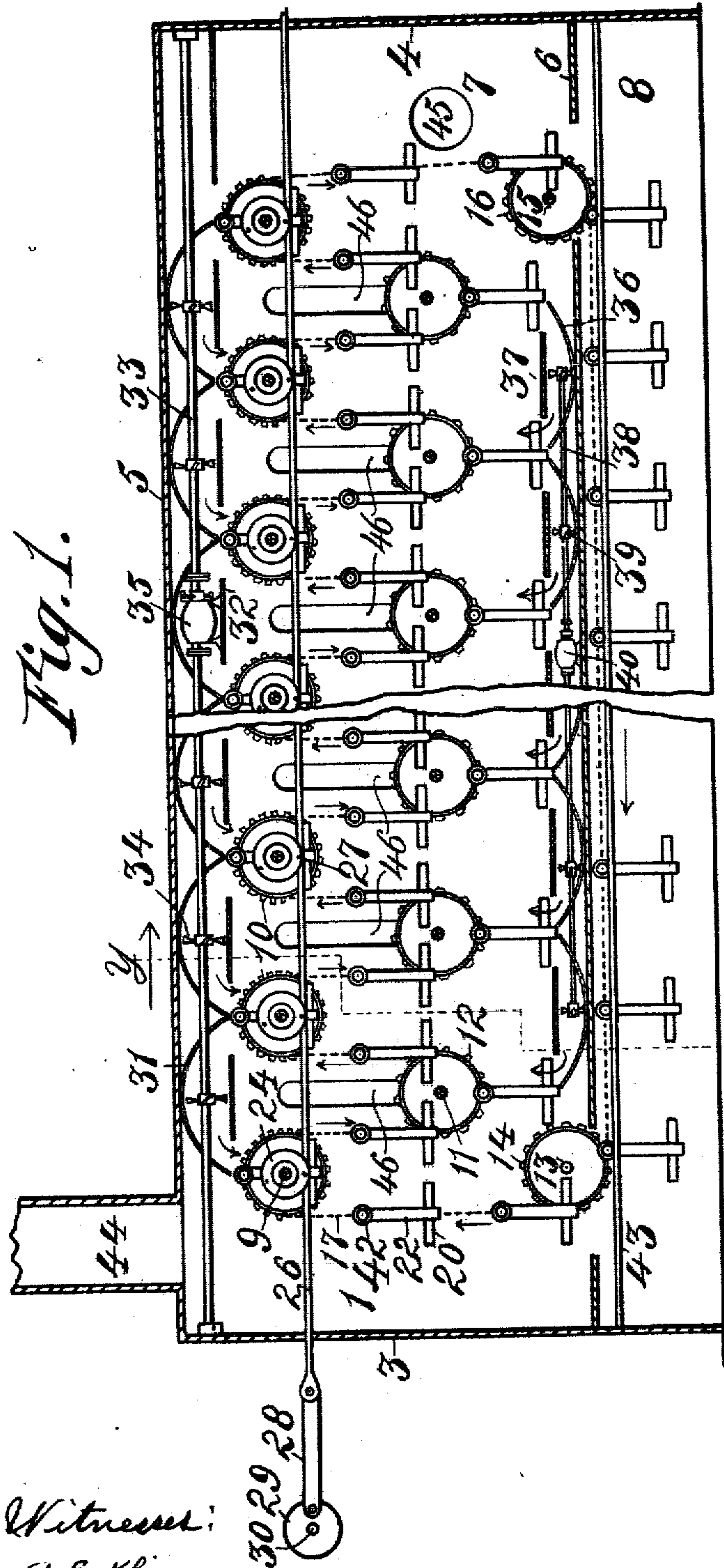
No. 811,821.

PATENTED FEB. 6, 1906.

H. B. CAMP.
DRIER.

APPLICATION FILED JULY 20, 1906.

2 SHEETS--SHEET 1.



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2 SHEETS—SHEET 2.

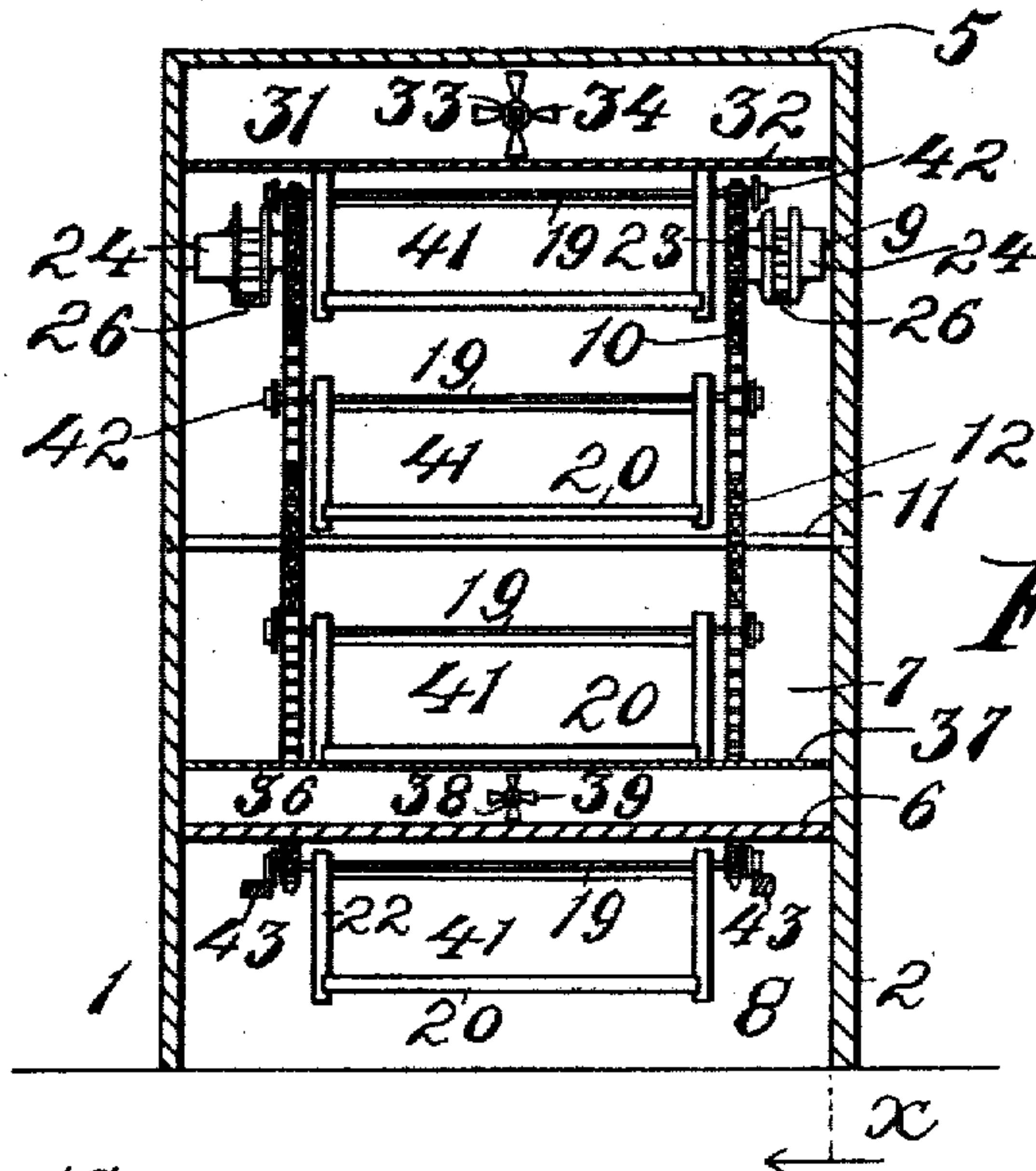


Fig. 4.

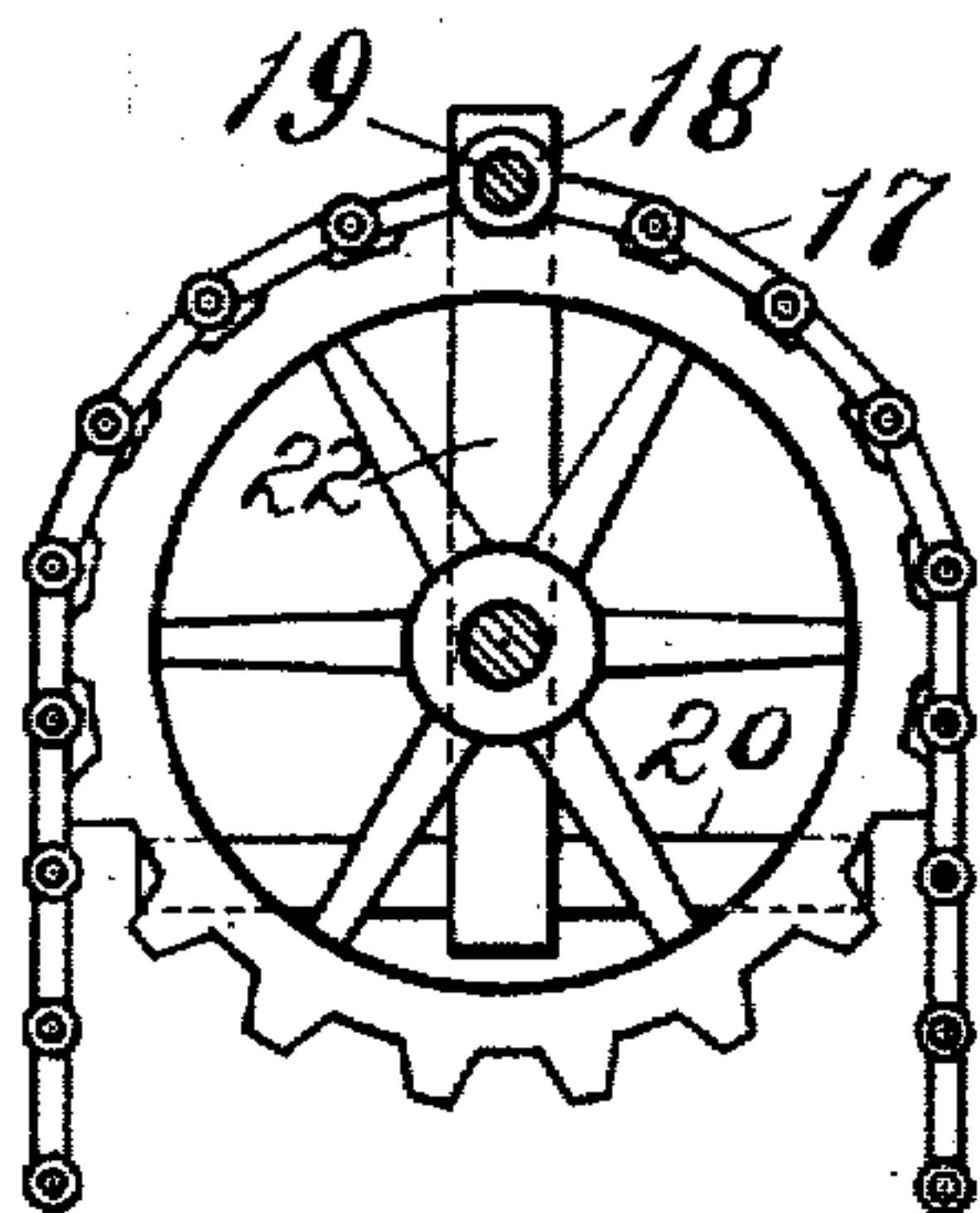


Fig. 5.

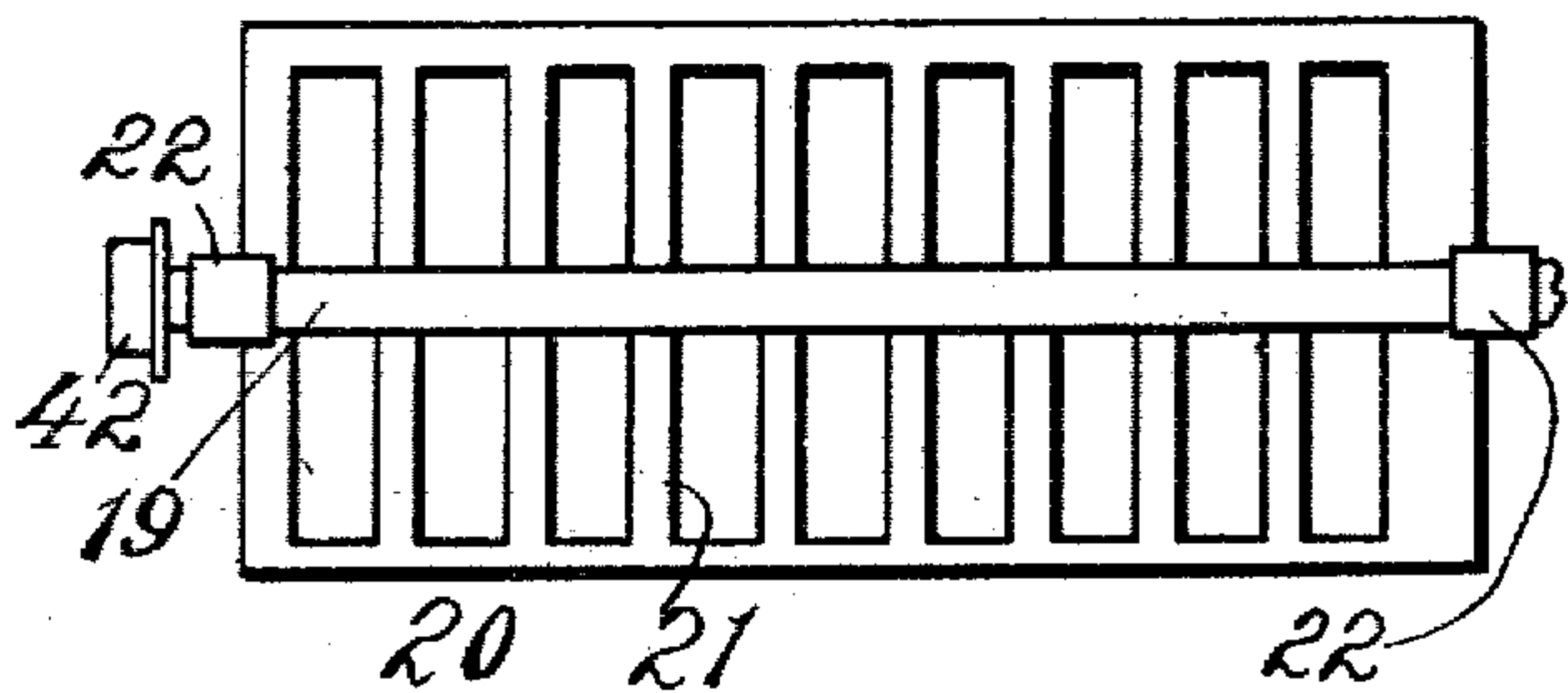


Fig. 6.

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UNITED STATES PATENT OFFICE.

HORACE B. CAMP, OF AKRON, OHIO.

DRIER.

No. 811,821.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed July 20, 1905. Serial No. 270,566.

To all whom it may concern:

Be it known that I, HORACE B. CAMP, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Driers, of which the following is a specification.

My invention relates to mechanism for drying plastic articles during the time intervening between their formation and the time when they are placed in a kiln for burning.

The object of my invention primarily is to produce a simple and economical device for drying the articles after their formation and previous to their burning, embodying in its construction a conveying device for transporting the articles to be dried and mechanism to create around and through the articles while on the conveying device a series of blasts of air for effecting the drying thereof so arranged and disposed with respect to the moving articles that the drying will be accomplished evenly and progressively to thereby avoid the danger of distortion of the articles.

The invention aims when in applying the air used in drying the articles to cause the freshly-formed and green articles to enter the device at or near the point where the air is discharged from the device relatively cool and to move the articles successively forward toward the source of inlet of the heated air and to be from there removed to the kiln. In accomplishing this object it is contemplated in this invention to force highly-heated air into one end of the device and to discharge it at the other and to so construct the device that during the passage of the air there-through it will traverse a circuitous route and be constantly agitated and kept in motion by suitably-located devices and to simultaneously convey the articles to be dried into the influence of the air at or near the point of discharge thereof, so that the articles will first encounter relatively cool air and then move forward through a circuitous progressive course toward the air-inlet, during which time the temperature of the air encountered by the articles will gradually increase, thereby preventing a sudden blast of highly-heated air from engaging the green ware when not in a condition to receive it.

The invention further aims to embody in a device of this character simple and effectual mechanism for accomplishing the hereinbefore-mentioned results.

With the foregoing and other objects in view the invention consists of the novel construction, combination, and arrangement of parts constituting the device to be hereinafter referred to, and illustrated in the accompanying drawings, which form a part of this specification, in which is shown the preferred embodiment of the invention; but it is to be understood that changes, variations, and modifications can be resorted to which come within the scope of the claim hereunto appended.

In the drawings, wherein like reference characters denote corresponding parts throughout the several views, Figure 1 is a section of Fig. 4 at the line X. Figs. 2 and 3 are details of a ratchet device for actuating the conveying device. Fig. 4 is a section of Fig. 1 at the line Y. Fig. 5 is a side elevation of one of the conveyer-chains and its sprocket-wheel used in conveying the articles through the device, and Fig. 6 is a plan view of one of the pallets used for receiving the ware and adapted to be conveyed by the conveyer-chains.

Substantially all the mechanism used in drying the articles hereinbefore referred to is inclosed in a house or building composed of side walls 1 and 2, end walls 3 and 4, and a covering or top 5. This structure, hereinafter referred to as the "inclosing" shell, may be suitably supported upon the ground or upon any foundation which the nature of the case requires, and it is divided longitudinally by a horizontal partition 6 into an upper chamber 7, which is the drying-chamber proper, and the lower chamber or conduit 8. Revolvably and suitably mounted and projecting inwardly from the side walls 1 and 2 are a series of stub-shafts 9. These shafts are situated at regularly-recurring intervals and are in horizontal alinement with each other, and each bears on its inner end a sprocket-wheel 10. Below the stub-shafts 9 and in horizontal alinement with each other are a series of transverse shafts 11, extending between the side walls 1 and 2 and suitably steadied and vertically movable in slots 12 therein. Each of these shafts 11 bears a pair of idler-wheels 12. The wheels 12 are so placed as to be in alinement with the sprocket-wheels 10. The positions of the wheels 12 are such as to alternate with the positions of the sprocket-wheels 10. Vertically below the sprocket-wheels 10, to the left in Fig. 1, is a transverse shaft 13, on

which is mounted a pair of sprocket-wheels 14, and below the sprocket-wheels 10, to the right in Fig. 1, is a transverse shaft 15, on which are a pair of sprocket-wheels 16. A pair of sprocket-chains 17 of suitable configuration are passed over the tops of each of the sprocket-wheels 10 and down around the under faces of the wheels 12 alternately, and the outer ends of these sprocket-chains are passed around the sprocket-wheels 14 and 16 and extend in a horizontal line therebetween. The sprocket-chains 17 are identically parallel with each other and are arranged to move in unison. The general construction of these sprocket-chains is immaterial and may be of any desired or preferred type; but at regular intervals in each chain are a series of bar-holders 18, (see Fig. 5,) in which are held the ends of cross-bars 19, which connect the two sprocket-chains together, and thereby further keep their motion uniform with respect to each other. On each of these bars 19 are pivotally suspended ware-carrying pallets 20, each consisting of a slatted or open-work floor 21, from the ends of which extend posts 22, which engage the bars 19. Extending between the posts 22 of the pallets 20 are dividing-boards 41, which extend upwardly nearly to the bars 19 and separate the pallets longitudinally into two parts. On both outer ends of the bars 19 are placed flanged wheels 42, freely revoluble thereon and for a purpose to be later described. From this description it will be seen that as the two chains 17 move over the sprocket-wheels they will carry and support the bars 19, and the pallets 20 being pivotally attached to said bars will always maintain themselves in a vertical position, and from the fact that the bottom portions of these pallets are slatted they will permit air to pass readily through the ware situated thereon. The means for actuating these sprocket-chains is as follows: On each of the stub-shafts 9 (reference is here directed to Figs. 2 and 3) are tightly-mounted ratchets 23, and on both sides of these ratchets 23 and abutting thereagainst and freely mounted on the shafts 9 are flanged hubs 24, one of which bears a pawl 25, arranged to engage the teeth on the ratchet 23.

Passing through the entire device are a pair of longitudinal slidable bars 26 so placed as to pass between the flanged hubs 24 near their lower portions, and through these bars and through each pair of flanged hubs 24 are pins 27. The bars 26 are reciprocated back and forth by the following mechanism: On one end of each of the bars 26 is pivotally mounted a connecting-rod 28, the other end of which is connected to a crank 29 on a rotatable shaft 30, suitably supported. As the cranks 29 reciprocate the bars 26 the pawls 25 will engage the ratchets 23 going in one direction, and thereby rotate the shafts 9,

and this motion is communicated to the sprocket-chains 17 and idler-wheels 12. As the bars 26 are reciprocated in the reverse direction the pawls 25 will ride over the teeth of the ratchets 23, and no movement takes place.

The mechanism for diffusing air through the device is as follows: Above the axial lines of the shafts 11 are a plurality of curvilinearly-formed air-deflectors 31, extending downwardly sufficiently to nearly encounter the pallets 20, carried by the sprocket-chains 17, and centrally under the deflectors 31 are horizontal deflectors 32, which do not extend sideways sufficiently to reach the depending portions of the deflectors 31, but are spaced apart therefrom.

Extending longitudinally of the device through the deflectors 31 is a rotatable shaft 33, bearing a number of fans 34, preferably placed over the centers of the horizontal deflectors 32. This shaft 33 and fans 34 are preferably rotated by placing an electric motor 35 some place on the shaft 33. On the horizontal partition 6 and projecting upwardly in alinement with the shafts 9 are a plurality of short curvilinearly-formed air-deflectors 36 and between them a series of horizontal deflectors 37, spaced apart from the deflectors 36 a short distance. Extending through the deflectors 36 is a rotatable shaft 38, bearing fans 39, preferably operated by an electric motor 41.

Extending longitudinally through the conduit portion 8 of the device are a pair of parallel bars 43, arranged to form a track to receive the flanged wheels 42, located on the outer ends of the bars 19 and the pallets suspended therefrom during their transit through the conduit portion 8. If deemed preferable, an upright stack 44 may be placed at one end of the device and extend from the top portion thereof to carry away the moisture-saturated air from within the shell of the device.

The operation of the device is as follows: The operation of the crank 29 on the shaft 30 will reciprocate the longitudinal bars 26 backward and forward by means of the connecting-rods 28. This motion of the slidable bars 26 will cause the progressive movement of the conveyer-chains 17, which will be carried over the tops of the sprocket-wheels 10 and down around the sprocket-wheels 12 successively until the last sprocket-wheel to the right is reached, and from thence the chains depend and pass around the sprocket-wheels 16 and from thence pass through the conduit portion 8 to the sprocket-wheels 14 and from thence upwardly around the first sprocket-wheel 10 to the left in Fig. 1. This motion will be kept up continuously as long as power is supplied to the shaft 30.

The ware will be loaded on the pallets near the sprocket-wheels 14 and will be from there progressively carried through the entire device, following the circuitous route hereto-

fore described with reference to the sprocket-chains.

Heated air may be admitted to the device at the right of the device through a suitable opening 45 or to any other place most convenient and is kept constantly agitated and forced toward the stack 44 by the fans 34 and 39.

The peculiar conformation of the deflectors is such that air driven by the fans 34 will be forced from between the horizontal deflectors 32 and curvilinearly-formed deflectors 31 downwardly in substantially a straight line and in doing so will follow the course indicated by the arrows and pass through the ware situated on the pallets, and also the air driven forward by the fans 39 will pass outward around the ends of the deflectors 37 and will be guided by the deflectors 36, so as to pass upwardly through the openings formed in the floors of the pallets and through the ware situated thereon.

As there are a large number of fans 34 and 39 within the device, the air will be kept in constant agitation and gradually directed toward the left end of the device in Fig. 1 and be from there conveyed by the stack 44. The air as it enters the device at the right end in Fig. 1 can be highly heated and will take up the moisture from the ware and gradually dry the same as it pursues its circuitous route through the shell, and at the same time the air will be gradually cooled, so that by the time that it has reached the ware at or near the uptake-flue 44 it will be of such a temperature as not to injure the green ware being loaded onto the pallets at that end of the device.

It will be noticed (as already described) that the shafts 11 are vertically adjustable in slots 46, and they and the idler-wheels 12 mounted thereon hang on the dependent portions of the sprocket-chains 17 between the shafts 9, and the portions of the sprocket-chains which pass down and around the sprocket-wheels 12, in connection with the pallets suspended on these portions of the chains, constitute a suspended weight on the remaining portions of the sprocket-chains, which serve to keep the entire length of the sprocket-chains taut and serve to take up any slack which may exist therein.

What I claim is—

The combination in a device of the class described comprising an inclosing shell, a plurality of sprocket-wheels mounted in said shell, said sprocket-wheels being arranged in pairs the members of each pair being oppositely disposed with respect to each other, parallel conveyer-chains arranged to run on said sprocket-wheels, means on said conveyer-chains to support ware-carrying pallets, pallets on said supporting means, means to operate said chains in a step-by-step movement, means to create a plurality of air-currents in said shell adjacent the course of said ware-carrying pallets, and means to direct said currents through said ware.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HORACE B. CAMP.

Witnesses:

C. E. HUMPHREY,
GLENARA FOX.