Feb. 21, 1956 X. B. K. GREEN ET AL 2,735,134

LOCK HINGE

Filed June 18, 1953 2 Sheets-Sheet 1

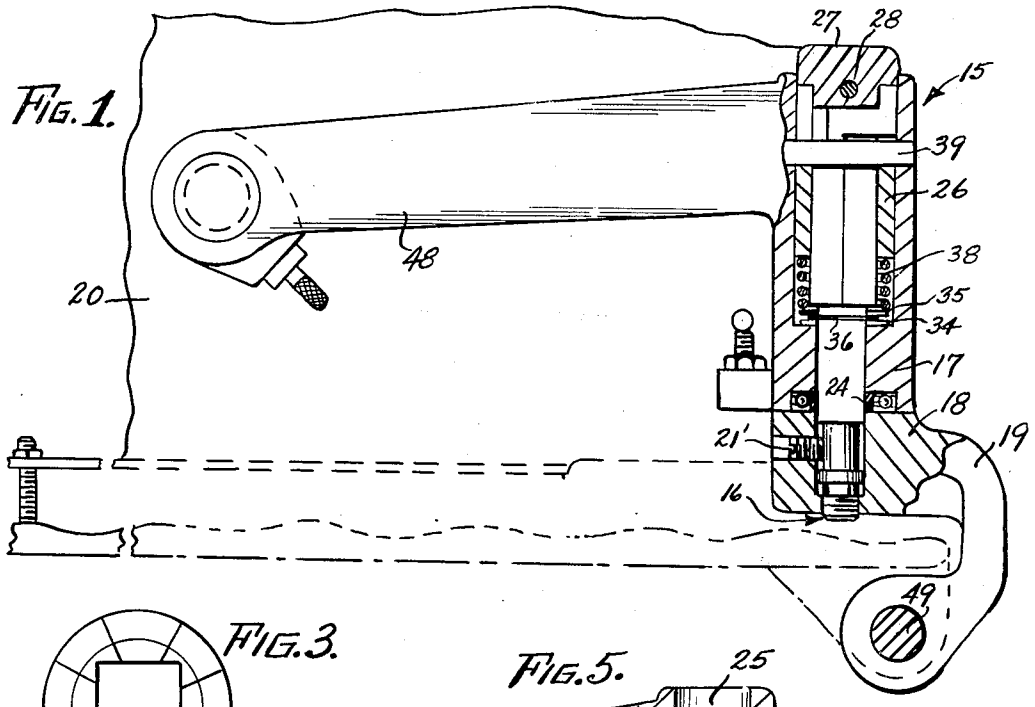


FIG. 1.

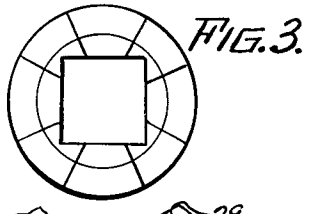


FIG. 3.

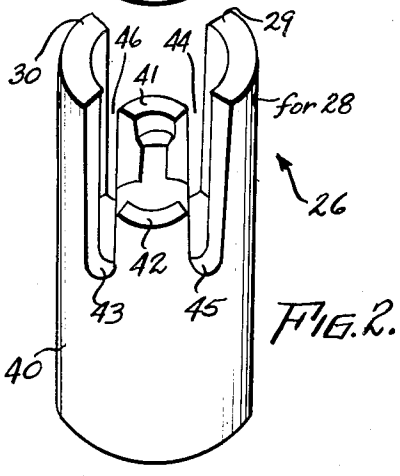


FIG. 2.

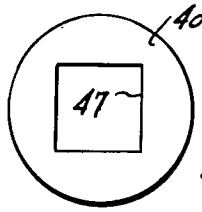


FIG. 4.

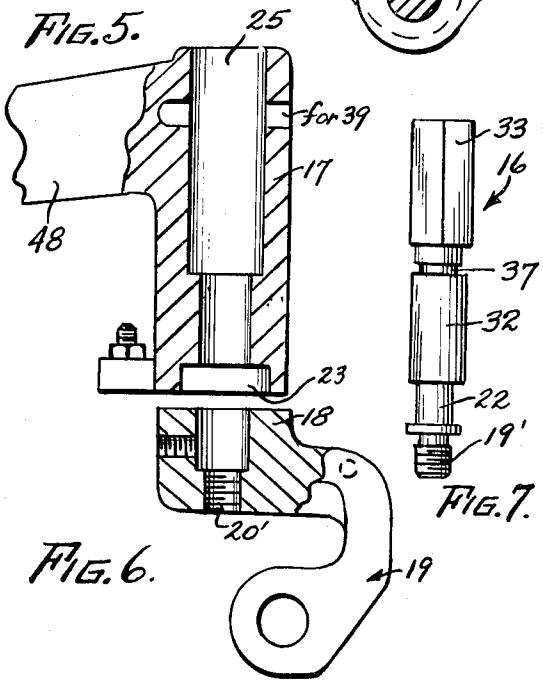


FIG. 6.

FIG. 7.

FIG. 5.

XAN B. K. GREEN,
HARRY PREBLE, JR.,
INVENTORS,
by
ATTORNEY.

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LOCK HINGE

Filed June 18, 1953 2 Sheets-Sheet 2

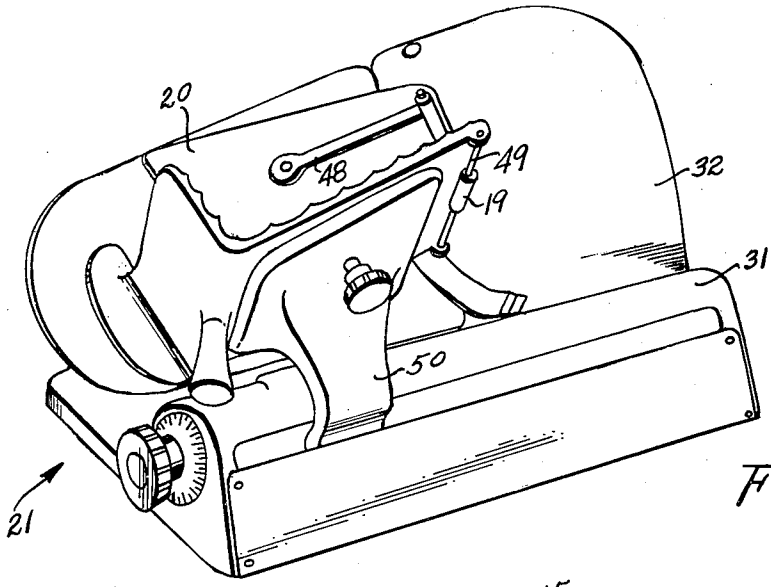


FIG. 8.

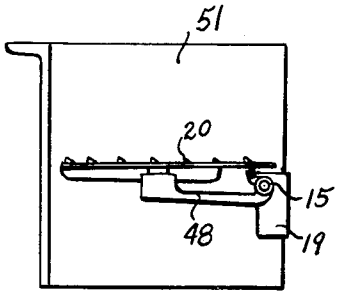


FIG. 9.

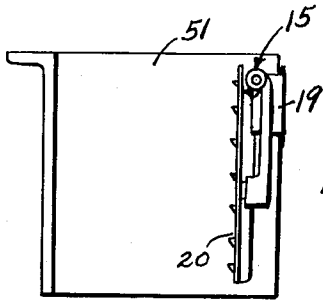


FIG. 10.

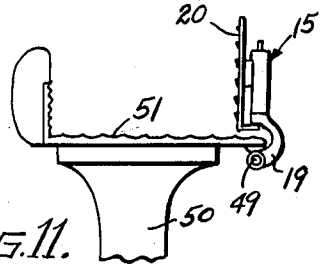


FIG. 11.

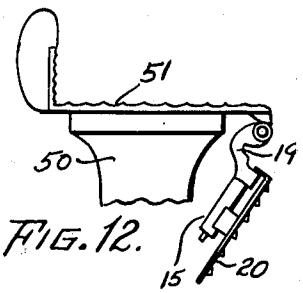


FIG. 12.

XAN B. K. GREEN,
HARRY PREBLE, JR.,
INVENTORS,

BY

ATTORNEY.

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LOCK HINGE

Xan B. K. Green, New Paltz, and Harry Preble, Jr., Cross River, N. Y., assignors to General Slicing Machine Co., Inc., Walden, N. Y., a corporation of New York

Application June 18, 1953, Serial No. 362,566

4 Claims. (Cl. 16—144)

The present invention relates to hinges and more particularly to the type wherein its knuckles are locked against relative movement about their axis pin at predetermined positions of one knuckle in relation to the other.

The principal object of this invention is to provide a novel and improved lock hinge of the character mentioned.

Another object hereof is to provide a lock hinge of novel and improved construction which is sturdy and non-wobbly at all of its possible set positions.

A further object hereof is to provide a novel and improved lock hinge which is push-button operated, easy to use, reasonable in cost and efficient in carrying out the purpose for which it is designed.

Other objects and advantages will become apparent as this disclosure proceeds.

In the accompanying drawings forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

Fig. 1 is a central longitudinal sectional view of a lock hinge structure embodying the teachings of this invention. Such hinge is here shown used in conjunction with the pusher or prong plate of a food slicing machine.

Fig. 2 is an enlarged perspective view of the push button member included in said hinge structure. By manipulating this push button, the hinge knuckles are either free to turn relative to one another on the hinge axis pin, or to be locked in one of a plurality of positions relative each other.

Fig. 3 is a top view of Fig. 2.

Fig. 4 is a bottom view of Fig. 2.

Fig. 5 is a longitudinal central sectional view of one of the hinge knuckles.

Fig. 6 is a similar view of the other hinge knuckle.

Fig. 7 is a longitudinal view of the axis pin for said knuckles.

Fig. 8 is a pictorial view of a food slicing machine utilizing the lock hinge of Fig. 1.

Fig. 9 is a top plan view of the food-carrying platform and the pusher plate of said slicing machine. In both this view and in Fig. 8, said pusher plate is shown in use position.

Fig. 10 is a similar view showing the pusher plate moved a quarter turn by the use of the lock hinge taught herein.

Fig. 11 is a view of which Fig. 10 is the top plan view.

Fig. 12 is similar to Fig. 11, but shows the pusher plate swung away to an unobstructive position to clear the platform for loading or to permit easy cleaning of said platform and the prong or pusher plate aforesaid.

In the drawings, the numeral **15** designates generally the preferred embodiment of the lock hinge structure having the axis pin **16** for the hinge knuckles **17** and **18**; the latter of which may be an integral part of the slide **19** which carries the pusher plate **20** of the food slicing machine **21**. The said axis pin **16** is fixedly secured at one end to the knuckle **18** from which it extends into the knuckle **17**. This secured end of said axis pin may be threaded as at **19'** to fit into the threaded hole **20'** and is maintained against axial rotation by the set screw **21'** which engages the reduced shank portion **22** of such axis

pin. In the end of the knuckle **17** next to knuckle **18**, there is a comparatively shallow counterbore **23** to house a thrust bearing unit **24** carried on the axis pin **16**, while at the other end of said knuckle **17** there is provided a relatively deep counterbore **25** which has therein the longitudinally slidably fitted tine-carrying tubular member denoted generally by the numeral **26**, which latter is a push button having the finger piece or head element **27** secured thereon by means of a pin **28** held in a pair of opposite tines **29, 30**.

That intermediate part of the axis pin **16** which fits into the bore **31** so that the knuckle **17** may revolve thereon, is denoted by the numeral **32**, while the end portion **33** of said hinge pin which is within the push button **26**, is of non-circular or of square cross-section. Intermediate and in contact with the loose washers **34, 35** there is a bowed spring retainer ring **36** mounted as a flange on the reduced portion **37** of the pin **16**. The washer **34** rests on the bottom of the counterbore **25**, while a stressed compression spring **38** of coil form about the axis pin, rests on the washer **35** and urges the push button **26** in a direction outwardly of said counterbore **25**; the pin **39** across and within said counterbore **25**, acting as a stop therefor. The tubular part **40** of the push button member **26**, in the embodiment illustrated, has four tines **29, 30, 41, 42** extending longitudinally therefrom towards the entrance of the counterbore **25**. The tines **41, 42** which are diametrically opposite each other, are shorter than and between the other pair of diametrically opposite tines **29, 30**. Such construction affords the notches **43, 44, 45, 46** between the tines respectively. These notches are equi-spaced. The notches **43, 44** are opposite each other and pin **39** can lie through both of them simultaneously without play. The same applies to the notches **45, 46**. The push button member **26** slides along the square-section part **33** of the hinge axis pin and fits thereon through the square hole **47**. It is evident that when the push button member **26** is pushed into the counterbore **25** until pin **39** is clear of the ends of the low tines **41, 42**, the hinge knuckle **17** is free to move a quarter turn. When the pin **39** is in notches **43, 44** or in notches **45, 46** and the finger hold on the push button member **26** is let go, the hinge **15** is locked. In the assembly, the hinge axis pin **16** is so set and the push button member **26** is so mounted thereon, that at one locked position of the hinge **15** the pusher plate **20** shall be as in Fig. 9, while at the other locked position of said hinge structure, said pusher plate will be as in Fig. 10, if said hinge is to serve in the slicing machine as intended. It might here be mentioned that the pusher plate **20** is really carried on an arm **48** which extends as an integral part of the knuckle **17** in the illustrated embodiment. Also, as an expedient for the manufacture of the push button **26**, the square hole **47** need only be part way therealong while the balance may be a round bore to clear the axis pin part **33**.

It is important to note that the bowed spring retainer ring **36** is in tensed state in the assembly of the lock-hinge **15**. It is evident that this spring acting to pull knuckle **18** against knuckle **17**, and to push knuckle **17** downward against knuckle **18**, keeps the said knuckles tightly one against the other with force, thereby obviating all possibility of any wobble and maintains the arm **48** in rigid position at the locked positions of the hinge structure **15**. The stress in spring **36** can be adjusted by shifting the position of the pin **16** in the threaded hole **20'**.

The adaptation of such lock-hinge in the use illustrated on the slicing machine **21**, permits positioning the pusher plate **20** as shown in the Figs. 9 and 10 respectively. Then said pusher plate may be swung out of the way as in Fig. 12, because the slide **19** is both slidable and rotatable on its track rod **49** which is mounted on the carriage **50**, as

particularly shown on the food carrying platform 51, of such carriage.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiment shown herein be deemed illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

We claim:

1. In a lock hinge structure, a first member having a bore therethrough, a second member positioned in contact with the first member and across one end of said bore; the other end of said bore being counterbored, a tubular member longitudinally positioned within the counterbore and slidable therealong; the end of said tubular member furtherest from the plane of contact of said first and second members, having a plurality of pairs of spaced diametrically opposite longitudinal extensions determining pairs of diametrically opposite longitudinal notches in said tubular member; one pair of said diametrically opposite extensions being longer than the others, a finger piece carried by at least one of said longer extensions, accessible at the mouth of said counterbore and adapted to be manually pushed to move the tubular member inwardly in the counterbore, a first pin secured to the first member and extending diametrically across and within said counterbore and positioned in normal rest position through a diametrically opposite pair of said notches; said notch-engagement pin when in any of said pairs of diametrically opposite notches, holding the tubular member against rotation within the counterbore, spring means within the said counterbore urging said tubular member in a direction outwardly of said counterbore and against said notch-engaging pin, a second pin secured to the second member and extending into the bore and into said tubular member; the first member being rotatably mounted on said second pin; said tubular member being slidable along said second pin, means on said second pin engaging said tubular member against rotation about such second pin and stressed suring means within said counterbore, mounted and held against movement on said second pin; such stressed spring means pressing the first member against the second member; said tubular member when slid a sufficient distance into the said counterbore that the first pin is out of said notches, freeing said first member for rotation about said second pin within the spaces between said longer extensions whereby said first pin can be positioned to be set in any pair of opposite notches upon relative rotation of the first and second members and the subsequent release of the tubular member.

2. The lock-hinge structure as defined in claim 1, wherein the number of longitudinal extensions on the tubular member is four thereby presenting four notches; the diameters determined by such two pairs of notches, being in perpendicular relation.

3. The lock-hinge structure as defined in claim 1, wherein the stressed spring means on the second pin urging the first member against the second member, is a bowed spring washer.

4. The lock-hinge structure as defined in claim 1, wherein the second pin is straight and includes a screw portion threadedly engaged in the second member and is thus adapted for movement to adjust the stress in said stressed spring means urging the first member against the second member and a means on the said second member to fix the second pin against rotation.

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