United States Patent

Young, Jr.

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[54] LOCKING TONGS

[72] Inventor: **Norman S. Young, Jr.**, P.O. Box 54, Malden Bridge, N.Y. 12115

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[52] **U.S. Cl.** **294/106**, 294/118

[51] **Int. Cl.** **B66c 1/44**

[58] **Field of Search** 294/86, 91, 95, 97, 103, 104, 294/106, 108, 116, 118

[56] **References Cited**

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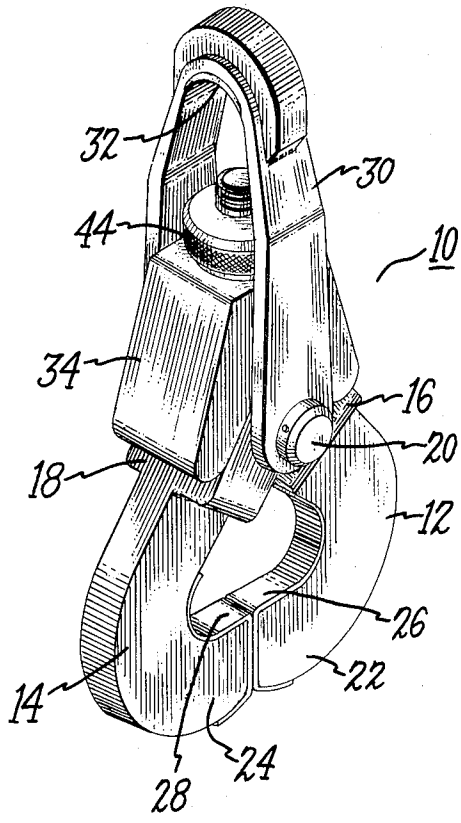
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Primary Examiner—Evon C. Blunk
Assistant Examiner—Johnny D. Cherry
Attorney—Francis X. Doyle

[57] **ABSTRACT**

Tongs for lifting heavy members such as structural steel, wheels, pipes and the like. The tongs are provided with a pair of opposed arms which are pivoted at one end about a shaft member. The opposite ends of the arms provide a gripping means for lifting members. The shaft member is provided with a bail member which may be secured to a crane or similar device to lift the tongs. A threaded member is also pivotally mounted on the shaft between the arms and carries a locking member which is movable on the threaded member and has sides which engage the exterior of the arms to lock them in lifting engagement with an object to be lifted. A nut is provided on the threaded member and may be threaded into contact with the locking member to hold it in a locked position.

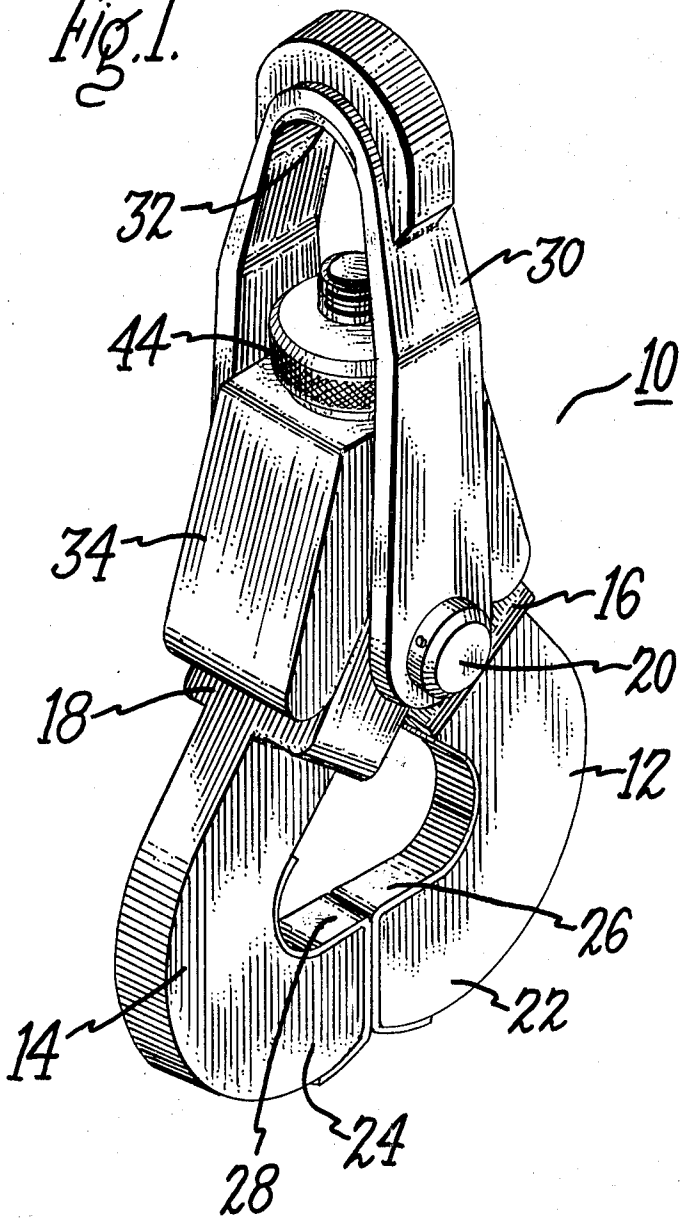
5 Claims, 4 Drawing Figures



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2 Sheets-Sheet 1

Fig. 1.



Inventor,
Norman S. Young, Jr.,
by Francis K. Hoyle
His Attorney.

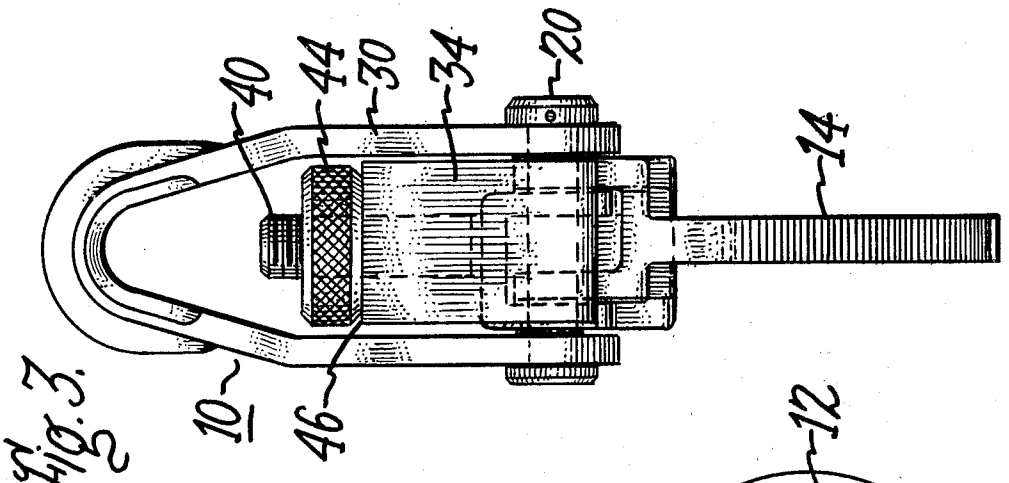


Fig. 3.

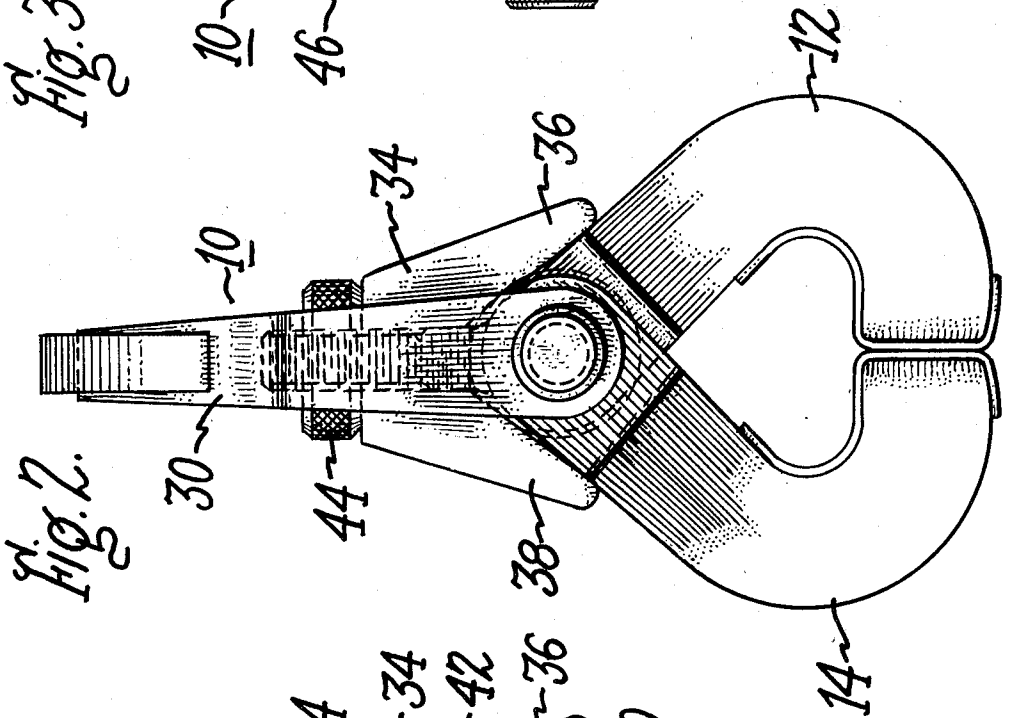


Fig. 2.

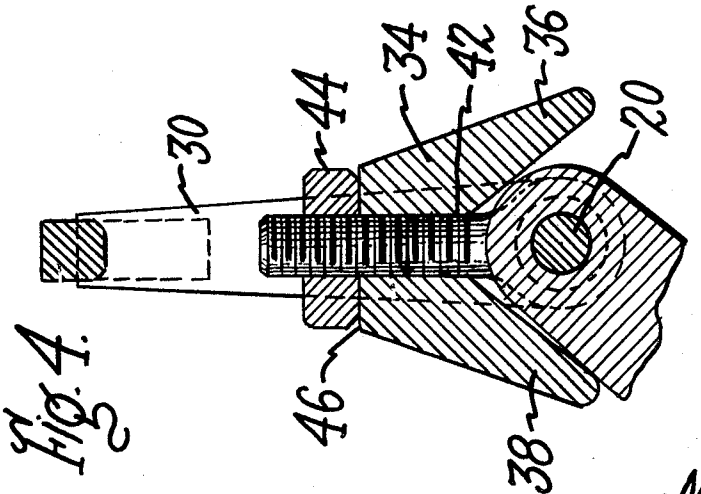


Fig. 4.

Inventor,
Norman S. Young, Jr.,
by Francis K. Doyle
His Attorney.

LOCKING TONGS

BACKGROUND OF THE INVENTION

This invention relates to lifting tongs, and more particularly, to lifting tongs provided with locking means for locking the tongs in engagement with an object to be lifted.

As is well known to those skilled in the lifting tong art, tongs are used in many instances to lift heavy objects, such as structural steel and the like, and move them about for various purposes in a manufacturing plant or the like. A common type of lifting tong comprises a pair of opposed arms which are pivoted at one end and which have gripping means at the opposite end for gripping objects to be lifted. Usually a bail is provided on the pivot and provides means for applying a lifting force, such a by a crane. In this common type of lifting tongs the bail engages the arms when lifting force is applied, forcing the arms into secure engagement with the object to be lifted. As long as the lifting force is applied the arms will maintain their secure grip on the object being carried. However, as is well known, when the lifting force is released, such as when the object is placed on the floor, or on a machine bed, the tongs release their grip, often allowing the carried object to fall to its side. Many industrial accidents are caused by the premature release of lifting tongs.

Another common problem with the usual type of lifting tongs is that they are unable to lift in a horizontal plane. As is well understood a vertical lifting force is required to provide the necessary gripping force to the arms of the tongs. Thus, it will be apparent that there is presently a need in the lifting tong field for lifting tongs which will not prematurely release a carried object and one which will enable the movement of objects in a horizontal plane.

It is therefore a principal object of this invention to provide a lifting tong which may be used to lift objects without danger of premature release.

A further object of this invention is to provide lifting tongs which may be used to move objects in a horizontal plane.

A still further object of this invention is to provide lifting tongs which may be used to move objects from a horizontal position to another desired horizontal position with a vertical carry in between.

Yet another object of this invention is to provide lifting tongs with locking means such that the tongs may be locked in gripping position on an object to be carried.

SUMMARY OF THE INVENTION

Briefly, in one form, this invention comprises lifting tongs having a pair of opposed arms which are pivoted, at one end about a shaft member. The opposite ends of the arms provide gripping means for gripping objects to be carried. A bail member is provided, pivotally secured to the shaft for providing lifting force to the tongs. Locking means are provided which slidably engage the exterior of the arms and which can be locked in any desired position against the arms to securely hold them in a gripping contact with an object to be carried.

The invention which is sought to be protected will be particularly pointed out and distinctly claimed in the claims appended hereto. However, it is believed that this invention, and the manner in which its various objects and advantages are obtained, as well as other objects and advantages thereof, will be better understood by reference to the following detailed description of a preferred embodiment, especially when considered in the light of the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the present preferred embodiment of this invention;

FIG. 2 is a side elevation view of the preferred form of invention shown in FIG. 1;

FIG. 3 is an end elevation view of the preferred form of the invention; and

FIG. 4 is a partial sectional view of the invention showing the details of the present preferred form of locking means.

DESCRIPTION OF PREFERRED EMBODIMENT

As above noted, this invention relates to lifting tongs and particularly to lifting tongs provided with locking means to enable the tongs to be locked in any desired position for gripping and lifting a desired object. Referring now to the drawings, in which like numerals are used to indicate like parts throughout the various views thereof, a detailed description will be provided of the present preferred embodiment of the invention. Considering first FIG. 1, a perspective view of the locking tongs **10** of this invention is shown. As there shown, the locking tongs **10** comprise a pair of arms **12, 14**, substantially C-shaped, which are pivotally mounted at the ends **16, 18**, about a shaft or pivot pin **20**. The opposite ends **22, 24** of the arms **12, 14**, provide gripping means for gripping an object to be carried or lifted. As will be understood, the arms **12, 14**, are made of steel or other strong, hard metal for lifting heavy objects.

In the present preferred embodiment a heat treated chrome-moly steel is used. This metal provides for the maximum weight capacity for the locking tongs. Obviously, for lower weights and other specific applications other types of metal could be used. In the preferred embodiment shown, soft metal members **26, 28**, are provided on the gripping faces of the gripping ends **22, 24**, of the arms **12, 14**. This material may be desired to protect the object to be lifted.

To enable a lifting force to be applied to tongs **10** a bail **30** is provided, pivotally secured to the pivot shaft **20**, as shown. As will be apparent from the above description, an object to be lifted may be enclosed by the gripping ends **22, 24**, of the arms **12,14**, and a lifting device, such as a crane, may be secured to the apex **32** of the bail **30** to provide a desired lifting force to the tongs **10**, and the object being lifted. In order to secure the arms **12, 14**, to the object to be carried, this invention provides a locking means to lock the arms **12, 14**, in a gripping position about an object to be carried. In the preferred embodiment, as best shown in FIGS. **2** and **4**, the locking means is in the form of a substantially triangular shaped member **34**, open at the bottom to form angularly extending legs **36, 38**, which slidably engage the exterior of the arms **12,14**.

The locking member **34** is slidably mounted on a threaded member **40**, which extends through an opening **42** in the locking member **34**, as is clearly shown in FIG. **4**. As can also be seen, especially in FIG. **4**, the threaded member **40** is pivotally mounted on the pivot pin or shaft **20**, between the arms of the bail **30**. The positioning of the threaded member **40** with respect to bail **30** is best shown in FIG. **3**. A nut member **44** is threaded on the threaded member **40** and engages the top **46** of locking member **34**, as best shown in FIGS. **3** and **4**. As will be apparent, the nut **44** may be threaded or screwed down on the threaded member **40** so as to engage the top **46** of the locking member **34**, securely locking it against the exterior of the arms **12, 14**, to lock such arms **12, 14**, in any desired gripping position about an object to be lifted or carried. An object may be moved in a horizontal position by merely pivoting the arms **12, 14**, about pivot pin **20**, to a horizontal position. The arms **12, 14**, may then be opened to grip the object. When the arms **12, 14**, are in the desired gripping position the locking member **34** will be moved downward on the threaded member **40** until the legs **36, 38**, of the locking member **34** securely engage the exterior of the arms **12, 14**. The nut **44** is then tightened down on threaded member **40**, against the top **46** of locking member **34**, securely locking the arms **12,14**, in the desired position. The tongs **10** may then be moved in a horizontal direction, or lifted in a vertical direction without danger of the arms **12, 14**, prematurely releasing the object gripped therebetween. Obviously, once the object has been moved to a desired position it may be readily released from the tongs **10** by merely loosening the nut **44** and moving the locking member **34** away from engagement with the arms **12,14**. This will allow the arms **12,14** to be opened to release the object.

While there has been shown and described the present preferred embodiment of this invention, it will be obvious to

those skilled in this art that many changes may be made in the various details of the structure without departing from the invention. It will be obvious that the particular shape of the arms and of the locking member may be changed as desired. These and other changes are considered as within the spirit and scope of the invention, as it is defined in the appended claims.

What is claimed as new and which it is desired to secure by Letters Patent of the United States is:

1. Locking tongs comprising;

a pair of opposed arms pivotally mounted at one end to a pivot member, the other end of said arms providing gripping means;

a bail means pivotally mounted to said pivot member and providing means for applying a lifting force to the tongs;

a locking means pivotally mounted to said pivot member and having portions engaging the exterior of said arms, said locking means being movable to engage said exterior of said arms to securely hold said arms in any desired gripping position.

2. Locking tongs as set forth in claim 1 in which said locking means includes a threaded member pivoted to said pivot member, a locking member slidable on said threaded member, and a nut threaded on said threaded member for engaging and locking said locking member.

3. Locking tongs as set forth in claim 1 in which said pivot member is a shaft extending through said bail and said one end of said opposed arms.

4. Locking tongs as set forth in claim 1 in which said gripping means are soft metal members secured to said other end of said opposed arms.

5. Locking tongs as set forth in claim 1 in which said opposed arms are substantially C-shaped and said locking means includes a locking member having a pair of angularly extending legs, said legs engaging the exterior of said arms.

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