Feb. 16, 1932. L. F. BAASH ET AL 1,845,389

TONGS

Filed March 18, 1930

Fig. 1.

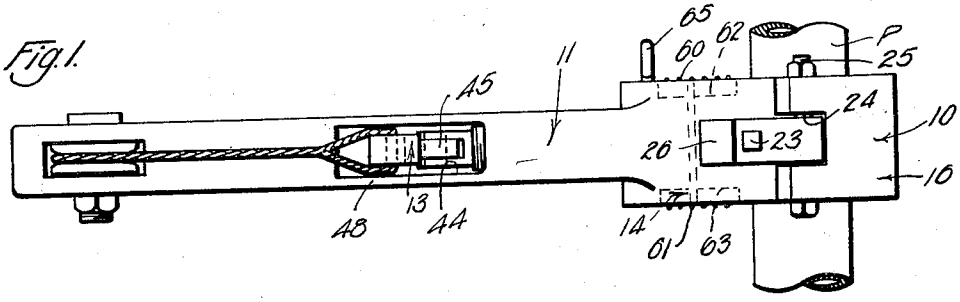


Fig. 2.

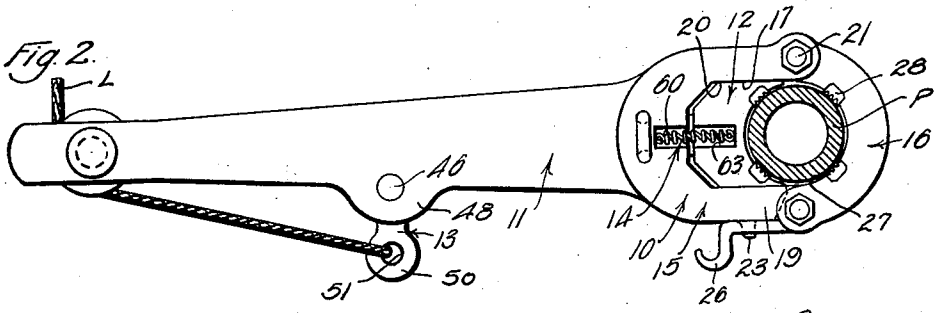


Fig. 3.

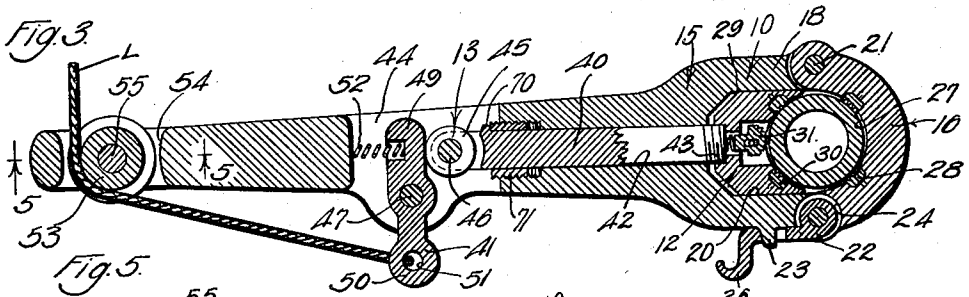


Fig. 5.

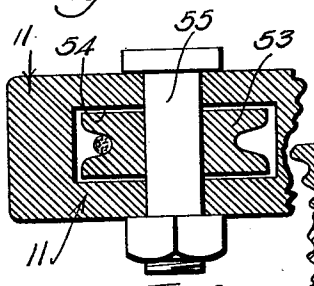


Fig. 4.

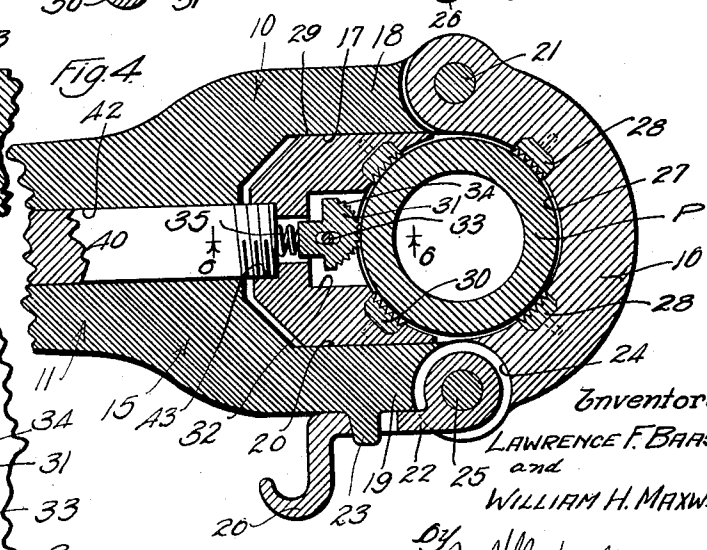
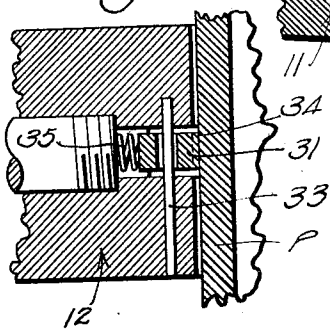


Fig. 6.



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UNITED STATES PATENT OFFICE

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TONGS

Application filed March 18, 1930. Serial No. 436,696.

This invention relates to tongs for handling pipe, tubing, etc., and it is a general object of the invention to provide a practical and effective tool of this character.

An object of the invention is to provide tongs that are particularly sturdy of construction and which are adapted to withstand hard usage.

Another object of the invention is to provide improved tongs having a gripping jaw operable by the line provided for actuating or turning the tongs.

Another object of the invention is to provide tongs in which the means for operating the jaw by the actuating line is of simple and improved construction and embodies but few simple parts.

It is another object of the invention to provide tongs of the character mentioned in which the means for operating the gripping jaw by the actuating line is carried by the handle of the tool so that the actuating line leaves the tool at the outer end of the handle giving it a substantial leverage for operating the tool.

Another object of the invention is to provide tongs of the character mentioned in which the gripping jaw is operated by the actuating line through a simple lever operating independently of the lever or handle of the tool.

It is a further object of the invention to provide tongs of the character mentioned in which the means or mechanism for operating the gripping jaw is carried in or housed by the handle of the tool and is protected against injury. The means for operating the gripping jaw, being carried by the handle, acts to balance the head or pipe encircling portion of the tool and may be made sufficiently heavy to withstand excessive strains without making the tool unbalanced or unwieldy.

Other objects and features of our invention will be best and more fully understood from the following detailed description of a typical form and application of the invention, throughout which description reference is had to the accompanying drawings, in which:

Fig. 1 is a side elevation of the tongs provided by the invention illustrating them engaging a pipe. Fig 2 is a top or plan view of the tongs. Fig. 3 is a horizontal detailed sectional view of the tool. Fig. 4 is an enlarged horizontal detailed sectional view of the head or pipe encircling portion of the tongs. Fig. 5 is an enlarged transverse detailed sectional view taken as indicated by line 5—5 on Fig. 3, and Fig. 6 is an enlarged transverse detailed sectional view taken substantially as indicated by line 6—6 on Fig. 4.

The features provided by the present invention are capable of embodiment in various forms of tools intended for various uses. In the following disclosure we will describe the invention as embodied in tongs for handling pipe and similar objects. It is to be understood that the invention is not to be construed as limited to the particular form and application of the invention about to be described, but is to be taken as including any features or modifications that may fall within the scope of the claims.

The embodiment of our invention illustrated in the drawings includes, generally, a head or pipe engaging means 10 for receiving or engaging a pipe P, or the like, a handle 11, a pipe gripping element or jaw 12 carried by the means 10, means 13 for operating the jaw 12, and means 14 for returning the jaw to the unactuated or retracted position after actuation.

The head or pipe engaging means 10 is provided to engage or embrace the pipe P and carries the jaw 12 for gripping the pipe. The means 10 may be varied considerably in construction, depending upon the type and character of the object to be handled by the tool and the class of use to which the tool is to be put. The means 10 illustrated includes two main parts: an inner or body part 15, and an outer part or gate 16.

The body part 15 of the means 10 may be a single rigid part and may be of comparatively heavy construction. In the preferred form of the invention the body part 15 carries the gripping jaw 12 and is U-shaped in its general configuration. The jaw 12 is arranged in an opening 17 formed between the side parts 18 and 19 of the part 15. The opening 17 may be provided with flat parallel side

walls 20 for slidably carrying the gripping jaw 12.

The outer part or gate 16 of the means 10 is in the nature of a closure for the opening 17 and is provided to retain the pipe P in position relative to be gripped by the jaw 12. The gate 16 may be of any suitable form and may be mounted on the body part 15 in any desired manner. In the particular case illustrated the gate 16 is a simple rigid part pivotally connected with the body part 15 by a pivot bolt 21. Suitable latch means may be provided in conjunction with the gate 16 for releasably holding the gate in the closed position. In the particular form of the invention illustrated in the drawings a latch 22 is pivotally mounted at the outer or free end of the gate 16 to cooperate with or engage a catch or lug 23 on the side part 19. The latch 22 may be pivotally mounted in a recess 24 in the outer end of the gate 16 by a pivot bolt 25. The latch 22 is provided at its outer end with a suitable handle 26 and is mounted so that it is adapted to cooperate with the lug 23 when the gate 16 is in the closed position to releasably hold the gate in the closed position. The latch 22 may be employed as a handle or means for operating the gate.

The inner side 27 of the gate 16 is shaped to seat against or engage the pipe P. For instance, it may be curved to conform to the exterior of the pipe. Gripping parts in the form of dies 28 may be provided on the inner side 27 of the gate to engage or grip the pipe P. The dies 28 may be seated in recesses or sockets in the inner side 27 of the gate and may be provided with pipe engaging parts in the form of teeth.

The handle 11 is provided to facilitate the handling of the tool and to carry the means 13 for operating the gripping jaw. The handle 11 is provided on the body part 15 of the means 10 and may be formed integral with the part 15. The handle 11 projects outwardly or rearwardly from the body part 15 and is preferably made comparatively long.

The gripping element or gripping jaw 12 is preferably slidably carried in the opening 17 in the body part 15 and is provided to clamp against or grip the pipe P. The gripping jaw 12 may be a simple unitary member such as is illustrated in the drawings and may be provided with flat sides 29 to slidably operate on the side walls 20 of the opening 17. The outer or pipe engaging end of the gripping jaw 12 is preferably curved or made concave to effectively seat against the exterior of the pipe. Gripping dies 30 may be provided in the outer pipe engaging end of the jaw 12.

In accordance with the preferred form of the invention means is provided for initially resisting relative rotational movement between the gripping jaw 12 and the pipe P. A pipe engaging member 31 may be provided on the gripping jaw 12 to engage the pipe P to resist movement of the tool and jaw relative to the pipe to ensure actuation of the jaw 11 when the operating line is operated. The pipe engaging member 31 is pivotally and slidably mounted within a recess or socket 32 in the outer end of the jaw 12. The member 31 may be mounted in the recess 32 on a pivot pin 33. The pin 33 is carried by the jaw 12 and extends through an elongated opening extending transversely through the member 31. The member 31 is adapted to pivot as well as shift radially relative to the pipe P. The outer or pipe engaging face 34 of the member 31 is rounded or curved so that it is eccentric to the pivotal axis of the member so that pivoting of the member 31 brings the pipe engaging face into effective engagement with the pipe. The member 31 may be provided with suitable gripping parts or teeth to grip the pipe. A spring 35 may be provided to normally yieldingly hold the member 31 in position where it is adapted to engage the pipe. The spring 35 may be arranged under compression in the socket 32 to react against the inner end of the member 31.

The means 13 for operating the jaw 12 into tight engagement with the pipe P is adapted to be operated directly by an actuating line L, or the like, employed for turning the tool. The means 13 is carried by or mounted in the handle 11 of the tongs. The means 13 includes a rod 40 connected with the gripping jaw 12 and a lever 41 adapted to be operated by the line L to actuate the rod 40. The rod 40 is slidable in a longitudinal opening 42 in the unit formed by the handle 11 and the body part 15. The inner end of the rod 40 extends into the opening 17 where it may be screw threaded into a socket 43 in the rear end of the jaw. The outer end of the rod 40 projects into a transverse slot or opening 44 in the handle 11. The opening 44 is preferably located about midway between the ends of the handle 11 and is provided to carry the lever 41. The outer end of the rod 40 that extends into the opening 44 may be provided with anti-friction means to cooperate with the lever 41. The outer end of the rod 40 may be yoked and an anti-friction roller 45 may be rotatably mounted between the yoked parts of the rod by a pin or shaft 46.

In accordance with the preferred form of the invention means is provided for limiting the inward movement of the rod 40. A lug or projection 70 is provided on the rod 40 to engage a sleeve 71 screw threaded into the outer end of the opening 42. The projection 70 is adapted to engage the end of the sleeve 71 to limit the inward movement of the rod. The sleeve 71 may be adjusted to various positions to permit the rod and jaw 12 to be operated inwardly the desired amount.

The lever 41 is pivotally carried by the handle 11 and is adapted to be operated by

the actuating line L to force the rod 40 inwardly to shift the jaw 12 into gripping engagement with the pipe P. The lever 41 is pivoted to the handle 12 at a point offset from the end of the rod 40. The lever 41 may be pivotally mounted in the opening 44 on a pivot pin 47 carried by projecting parts 48 on the handle 11 at one side of the opening 44. The lever 41 includes an inner arm 49 for engaging the anti-friction roller 45 and an outer arm 50 for connection with the operating line L. The inner arm 49 is provided with a flat inner face to effectively cooperate with the roller 45 and the end of the arm 49 may be rounded to compensate for the arcuate movement of the arm and to effectively engage the roller 45. The outer arm 50 of the lever 41 projects laterally from the handle 11 and is provided as a means for operating the lever and as a means for gaining the desired leverage. The outer end of the arm 50 may be provided with suitable means for connection with the actuating line L. An opening 51 may be provided in the arm 50 for passing the actuating line L. The arms 49 and 50 of the lever 41 may be proportioned and related to give the desired amount of leverage for operating the rod 40 by the actuating line L. In accordance with the preferred form of the invention means is provided for normally retaining the inner arm 49 of the lever in cooperative engagement with the roller 45. A compression spring 52 may be arranged under compression between the outer side of the arm 49 and the outer end of the opening 44.

In practice it is desirable to apply a lateral pull or force to the handle 11 preferably at its outer end for operating the tongs. In accordance with the preferred form of the invention means is provided for arranging the actuating line L so that it leaves the outer end of the handle 11 at the desired angle and so that it is connected to the means 13 to properly operate it. In the construction illustrated the line L extends outwardly from the lever arm 50 toward the outer end of the handle 11 and then extends laterally from the handle 11 at the side opposite to that from which the lever arm 50 projects. A pulley 53 is rotatably mounted at the outer end of the handle 11 to pass or carry the line L. The pulley 53 may be rotatably mounted in an opening 54 at the outer end of the handle on a pin or shaft 55.

The means 14 is provided for returning the gripping jaw 12 to its normal retracted position after operation. The means 14 may be in the form of spring means. In the particular embodiment of the invention shown in the drawings the means 14 includes one or more springs arranged between the body part 15 and the jaw 12. We have illustrated a spring 60 at the upper sides of the part 15 and the jaw 12 and a spring 61 arranged at the lower sides of the body part 15 and the jaw. The springs 60 and 61 are preferably arranged in openings or recesses 62 and 63, respectively, in the upper and lower sides of the tool. The springs 60 and 61 may be helical springs that act through contraction to return the jaw 12 after its actuation. Each spring has one end secured to the body part 15 of the pipe encircling means and the other end secured to the jaw 12. When the jaw 12 is operated to the gripping position the springs are elongated and when the means 13 is released the springs contract to return the gripping jaw 12 to its normal retracted position.

Means may be provided for suspending or carrying the tongs. In the form of the invention illustrated an eye bolt 65 projects upwardly from the upper side of the body part 15. The bolt 65 is adapted to receive a suspending line or like part for carrying the tongs.

It is believed that the operation of the tongs provided by this invention will be readily apparent from the foregoing detailed disclosure. Force applied to the line L acts to turn the lever 41 so that its inner arm 49 forces the rod 40 inwardly carrying the jaw 12 into gripping engagement with the pipe P. The pull on the line L also acts to turn or swing the tongs to rotate the pipe P. It is to be noted that the means 13 for operating the gripping jaw is of simple construction and is mounted in the handle 11 where it is protected and does not complicate the construction or operation of the active or pipe encircling portion of the tool. Further, the various parts of the means 13 may be of comparatively heavy construction to withstand excessive strains without making the tool heavy or unwieldy as the parts are carried where they act to balance the tool.

Having described only a typical preferred form of our invention, we do not wish to limit ourselves to the specific details set forth, but wish to reserve to ourselves any changes or variations that may appear to those skilled in the art or fall within the scope of the following claims.

Having described our invention, we claim:

1. A tool of the character described including, pipe engaging means, a pipe gripping element carried by said means, an elongated handle on said means, and means for operating the gripping element including, a rod slidably carried by the handle, a lever pivoted to the handle at a point a substantial distance from the pipe engaging means, the lever having an arm for engaging the rod, and an arm projecting from the handle for connection with an operating line, means on the handle for guiding the operating line and means for limiting movement of the lever whereby the operating strain may be trans-

mitted from the line to the handle through the last mentioned means.

2. A tool of the character described including, pipe encircling means, a pipe gripping element carried by the pipe encircling means, a handle of substantial length for the pipe encircling means, and means for operating the gripping element including, a rod slidably carried by the handle, a lever pivoted to the handle at a point substantially midway between its ends, the lever having an arm for engaging the rod, and an arm projecting from the handle for connection with an operating line, means on the handle for guiding the line including a pulley for receiving the line and means for limiting movement of the lever whereby the operating strain may be transmitted from the line to the handle through the last mentioned means.

3. A tool of the character described including, pipe encircling means, a pipe gripping element carried by the pipe encircling means, a handle of substantial length for the pipe encircling means, and means for operating the gripping element including, a rod slidably carried by the handle, a lever pivoted to the handle at a point removed from the pipe encircling means, the lever having an arm for engaging the rod, and an arm projecting laterally from the handle for connection with an operating line, a pulley rotatably carried in the outer end of the handle for guiding the line, and means for limiting movement of the lever whereby the operating strain may be transmitted to the handle from the line through the pulley to turn the tool.

4. A tool of the character described including, pipe encircling means, a pipe gripping element carried by the pipe encircling means, an elongated rigid handle for the pipe encircling means, and means for operating the gripping element including, a rod slidably carried in an opening in the handle, a roller at the outer end of the rod, a lever pivoted in the handle, the lever having an arm for engaging the roller, and an arm projecting laterally from the handle for connection with an operating line, a pulley rotatably mounted at the outer end of the handle for passing the line laterally from the handle, and means for limiting movement of the lever whereby the operating strain may be transmitted to the handle from the line through the pulley to turn the tool.

5. Tongs of the character described including, a pipe encircling means, a rigid handle of substantial length for the said means, a gripping element slidably carried by the said means, means for operating the element directly by a line for operating the tongs including, a rod slidably carried by the handle and connected to the element, and a single pivoted lever on the handle at a point removed from the pipe encircling means, the lever having an arm for engaging the rod, and an arm projecting laterally from the handle for connection with the operating line, means for guiding the operating line laterally from the end of the handle and means for limiting movement of the lever whereby the operating strain may be transmitted to the handle by the line through the guide means.

6. Tongs of the character described including, pipe-embracing means, a gripping jaw slidably carried by the said means and adapted to engage the pipe, an elongated handle rigidly connected with said means, a rod connected with the jaw and slidably carried by the handle, a lever pivoted to the handle at a point removed from the said means and having an arm engaging the rod and an arm projecting from the handle, and a line tied to the last-mentioned arm adapted to be pulled to operate the jaw and engaging the handle adjacent its outer end to pass laterally therefrom whereby it transmits a lateral force to the handle to turn the tongs after the jaw has engaged the pipe.

7. Tongs of the character described including, pipe-embracing means, a gripping jaw slidably carried by the said means and adapted to engage the pipe, an elongated handle rigidly connected with said means, a rod connected with the jaw and slidably carried by the handle, a lever pivoted to the handle at a point removed from the said means and having an arm engaging the rod and an arm projecting from the handle, a line tied to the last-mentioned arm adapted to be pulled to turn the lever and operate the jaw, and means adjacent the outer end of the handle for guiding the line laterally therefrom so that it transmits a lateral force to the handle to turn the tongs after the jaw has engaged the pipe.

8. Tongs including, pipe-embracing means, a gripping jaw carried by the said means for engaging the pipe, an elongated handle rigidly connected to the said means, a rod connected with the jaw and movable on the handle, a lever pivotally mounted on the handle at a point a substantial distance from the said means and having an arm operatively engaging the rod and an arm projecting laterally from the handle, a line tied to the said projecting arm and adapted to be pulled to pivot the lever and actuate the jaw, the gripping engagement of the jaw with the pipe limiting movement of the lever, and means adjacent the outer end of the handle for guiding the line laterally from the handle whereby the line transmits a lateral turning force to the handle when the jaw is in gripping engagement with the pipe.

In witness that we claim the foregoing we have hereunto subscribed our names this 14th day of March, 1930.

LAWRENCE F. BAASH.
WILLIAM H. MAXWELL.