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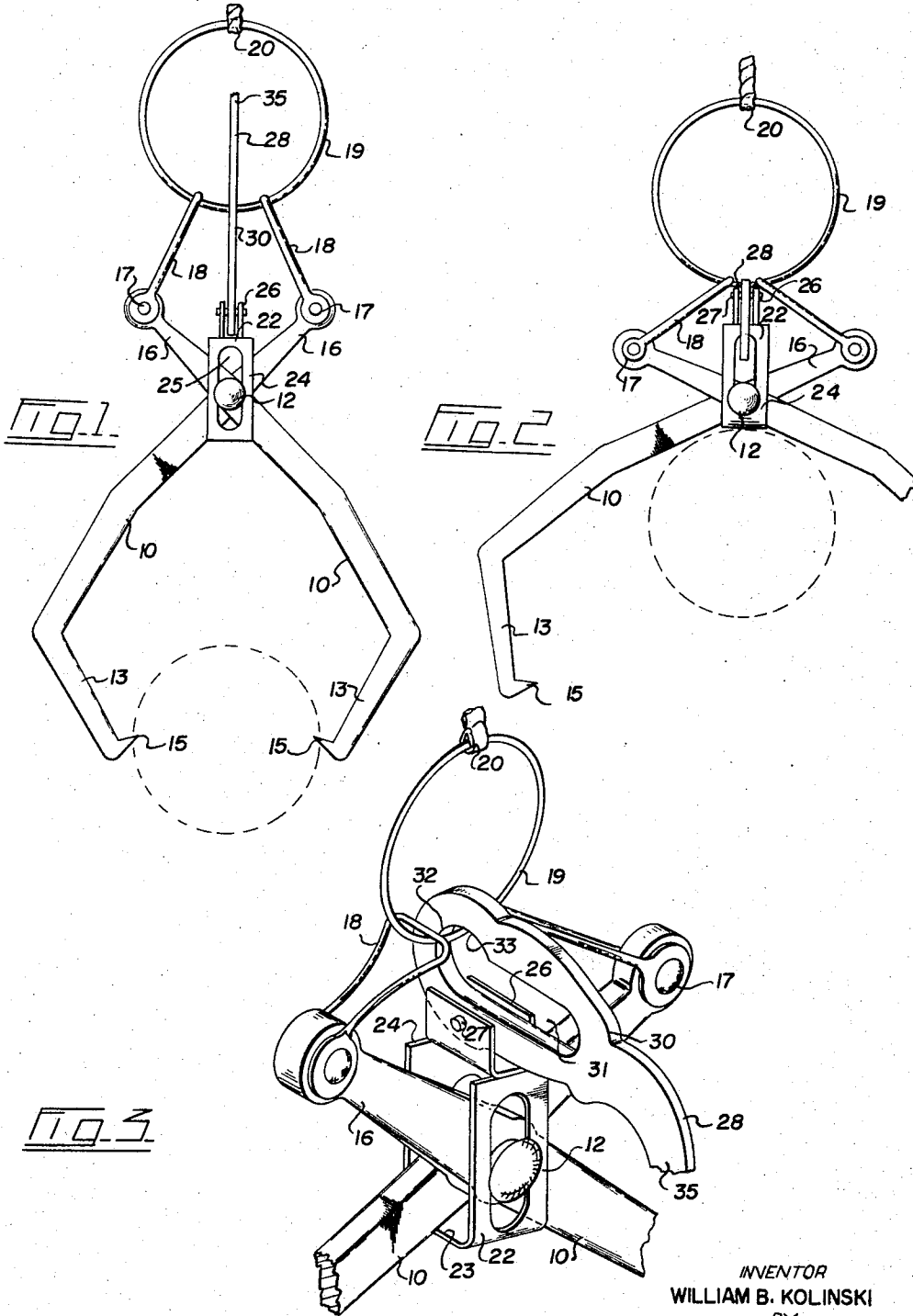
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AUTOMATIC TONGS

Filed June 9, 1966

2 Sheets-Sheet 1



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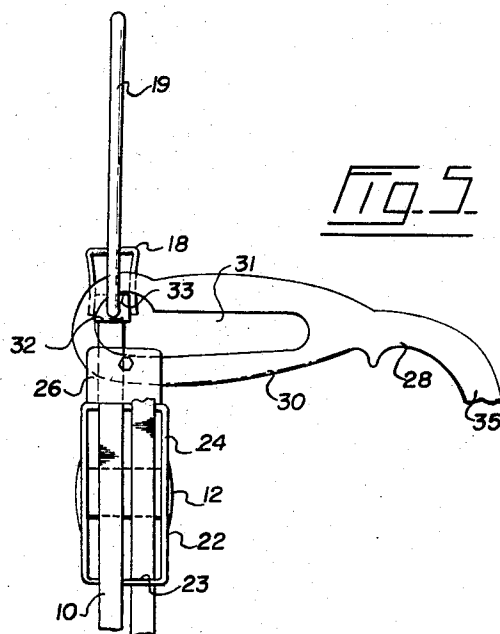
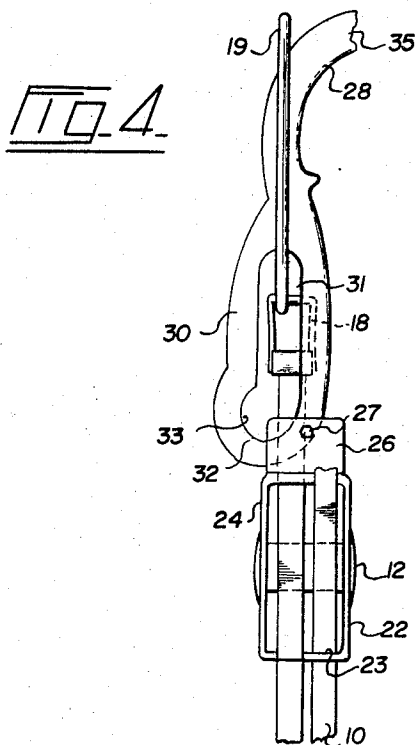
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AUTOMATIC TONGS

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This invention relates to tongs used primarily with log handling equipment, and more particularly to tongs which may be automatically disengaged from the log without the intervention of external means.

In the use of tongs for handling logs and the like, it is generally normal practice to suspend the tongs from a lifting cable in such a manner that when the tongs are applied to a log to be lifted, the cable automatically moves them to a gripping position. These tongs are usually shaped such that a log may be picked up easily by spreading them around the log and then tightening the cable to draw the tongs into gripping engagement with the log. However, difficulties are normally encountered when attempting to disengage the tongs from the log, and it is therefore common practice to have a man at the site at which the logs are to be deposited to hold the tongs in a spread position while the cable lifts them upwardly away from the log.

Working at the site of deposit of the logs is extremely dangerous as the logs, when released by the tong, quite often have a tendency to roll. This has resulted in the development of tongs which are automatically releasable after the logs have been deposited and which therefore do not require manual handling. Automatic tongs of this nature have, in the past, been of intricate and complicated design, prone to being damaged and being relatively costly to manufacture. Some of these automatic tongs also require the application of means external to the tongs themselves in order to cause operation thereof to a log disengaging position.

The present invention provides automatic tongs of extremely simple and rugged construction and, which without the application of external means, may be releasably locked in an open or non-gripping position by simply slackening off the lifting cable to which the tongs are secured.

The present invention comprises a pivot pin, a pair of tongs pivotally mounted in crossed relationship on the pin, said tongs having upper ends extending above the pin and load gripping arms extending below the pin, linking means connecting the cable and the upper ends of the tongs normally operative under a taut cable condition to urge the arms towards each other to a load gripping position, a tong engaging member slidably connected to the pin for vertical movement relative to the tongs into and out of supporting and spreading engagement with the arms, latch mechanism extending between the cable and tong engaging member operable by gravity when the cable is slackened off so as to render the linking means inoperative to operably connect the cable and tong engaging member, said member being moved by the cable when the latter is again drawn to a taut condition upwardly relative to the tongs and into spreading engagement with the arms.

In the drawings which illustrate the invention:

FIGURE 1 is a side view of the tongs in gripping engagement with the logs,

FIGURE 2 is a side view of the tongs similar to FIGURE 1 with the tongs shown in their disengaged position,

FIGURE 3 is an enlarged isometric view of a portion of the tongs showing the latter in the open or disengaged position,

FIGURE 4 is a side of a portion of the tongs illustrated in the gripping position similar to a position as illustrated in FIGURE 1, and

FIGURE 5 is an enlarged side view of a portion of the

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tongs showing the latter in their open or disengaged position as illustrated in FIGURE 2.

Referring to the drawings, the tong apparatus comprises a pair of tongs 10-10, interconnected in crossed relationship on a pivot pin 12. These tongs each have lower elongated arms 13-13 terminating at their lower ends in points 15-15. These tongs also have upper end portions 16-16 extending above the pin terminating in eyes 17-17 to which shackles 18-18 are applied, said shackles being engaged with a looped or closed link 19 connected to the end of a lifting cable 20.

A tong engaging member comprising a U-shaped bracket 22 having a base 23 and elongated spaced apart upstanding legs 24 is fitted to the tongs, the base 23 extending between the arms 13 and the legs 24 extending upwardly therefrom on either side of the said tongs. These legs 24 are each formed having elongated apertures 25 through which the pivot pin 12 extends, the latter being peened at its ends to maintain the bracket in slidable engagement therewith.

Across the free end of the legs 24 are secured, as by welding or the like, a pair of spacedly parallel plates 26 and, pivotally mounted for movement in a vertical plane on a shaft 27 extending between the plates 26, is a latch lever 28.

This lever 28 is formed having an elongated body portion 30 provided with a centrally-located longitudinally-extending closed slot 31 terminating at one end 32 in a laterally extending notch 33. The pivotal axis of the lever 28, as represented by the centre line of the shaft 27 and the notch 33 are, as illustrated in FIGURES 4 and 5, directly opposite each other on opposite sides of the slot 31.

From the body portion 30 at its end opposite the notched end of the slot 31, extends an elongated massive handle 35 which is bent laterally away from the longitudinal axis of the body and on the same side thereof as the said pivotal axis of the latter. The closed link 19 is slidably hooked through the slot 32 with the body portion 30 of the lever lying between the shackles 18-18.

From the drawings it will be observed that the relative size of the latch lever 28 and bracket 22 compared to the length of the end portions 16-16 of the tongs and the shackles 18-18, is such that when the latch lever is arranged in a substantially vertical position as illustrated in FIGURES 1 and 3, the weight of the tongs is supported from the link 19 by the shackles 18-18, the tongs thereby being in an operative condition for gripping a log or the like. It will be observed that the link 19 during opening and closing motions of the tongs is free to slide in the slot 32. However, the weight of the tongs either loaded or unloaded will, acting through the link 19 on the body portion of the latch lever, maintain the latter in a vertical position against the latter's tendency to gravity under the action of the handle 35 to a horizontal position, thereby permitting the tongs to be operated to pick up a log.

It will also be observed that when the handle 28 is arranged in its horizontal position as illustrated in FIGURES 2 and 5 of the drawings with the link 19 engaged in the notch 33, the tongs will now be supported from the link 19 acting through the latch lever and bracket 22, the base 23 of the latter engaging the arms 13-13 beneath the pivot pin so as to spread the tongs apart. Due to the weight of the massive handle 35, the latch lever 28 will remain in a horizontal position unless operated in its vertical position by some external means.

In the operation of the apparatus commencing with the tongs in the position as illustrated in FIGURES 1 and 4 as supported by the shackles 18-18 and with the latching lever 28 in its vertical position, the points 15-15 of the tongs are engaged in the log to be transported, and the log lifted and deposited at its deposit site. During this

movement, of course, due to the taut condition of the lifting cable, the latching lever will be maintained, by virtue of its engagement with the link 19, in its vertical position. The operator, in order to disengage the tongs from the log, need then only lower the tongs to rest upon the log so as to allow some slack in the cable. This will spread the tongs apart and will also permit the link 19 to move downwardly through the slot and opposite the notch 33. The overbalancing effect of the massive handle 35 will then swing the latching lever to its horizontal position moving the link 19 into the notch 33. Upon again tightening the cable, the base 23 of the bracket 22 will move into engagement with the tongs to maintain the latter in a spread or inoperative condition so that they cannot re-engage the log.

As has been previously indicated, it is quite often necessary to have a man at the site from which the logs are to be taken whose duty it is to properly position the tongs on the log to be lifted. It will of course be his duty to move the latching levers again to its vertical position to permit the link 19 to move upwardly in the slot and again permit the tongs to be supported by the shackles 18-18, thereby placing the tongs into condition in which they may be used to again grip a log.

Although it is preferable to employ a man at the loading site to lift the latching lever to its vertical position and to properly position the tongs for the log on its surfaces, his services may be dispensed with as the latch lever may be easily operated from its horizontal to its vertical position by the cable operator. It will be observed that as the handle 35 extends outwardly beyond the plane of the tongs, it will therefore be a simple matter for the operator operating the lifting cable to lower the tongs alongside the log to bring the handle in contact therewith so as to permit the weight of the tongs themselves to move the latch lever 20 to its vertical position.

It will be appreciated therefore that the tongs are fully automatic, being arrangeable, without the use of external means, between an operative and inoperative condition.

What I claim as my invention is:

1. Tong mechanism for use with a single lifting cable comprising a pivot pin, a pair of tongs pivotally mounted in crossed relationship on the pin, said tongs having upper ends extending above the pin and load gripping arms extending below the pin, linking means connecting the cable and the upper ends of the tongs normally operative under a taut cable condition to urge the arms towards each other to a load gripping position, a tong engaging member slidably connected to the pin for vertical movement relative to the tongs into and out of supporting and spreading engagement with the arms, latch mechanism extending between the cable and tong engaging member operable by gravity when the cable is slackened off so as to render the linking means inoperative to connect the cable and tong engagement member, thereby moving the latter when the cable is again drawn to a taut condition into supporting and spreading engagement with the arms.

2. Tong mechanism for use with a single lifting cable

comprising a looped link at the end of the cable, a pivot pin, a pair of tongs pivotally mounted in cross relationship in the pin, said tongs having upper ends extending above the pin and load gripping arms extending below the pin, linking means connecting the cable and the upper ends of the tongs normally operative under a taut cable condition to urge the arms towards each other to a load gripping position, a tong engaging member slidably connected to the pin for vertical movement relative to the tongs into and out of supporting and spreading engagement with the arms, an elongated latch member connected for vertical swingable movement adjacent one of its ends to the tong engaging member and slidably extending at its other end through the link and being normally maintained by the latter in a non-operative substantially vertically extending position when the tongs are operatively supported by the linking means, and being swingable by gravity when the cable is slackened to a position in which it extends substantially horizontally, said latch member having a notch formed in a side edge adjacent its said one end adapted when said latch member moves to its horizontally extending position to receive the link so as to form a connection between the link and tong engagement member, thereby moving the latter when the cable is again drawn to a taut condition into said supporting and spreading engagement with the tong arms.

3. Tong mechanism as claimed in claim 2 in which the tong engagement member is formed as a U-shaped bracket having a pair of parallel arms and a base, said arms each having closed longitudinally elongated pin receiving openings formed therein and being arranged on said pin with the base extending between the tong arms.

4. Tong mechanism as claimed in claim 2 in which the latch member comprises an elongated body portion having a longitudinally extending closed slot formed therein within which the link is slidably engageable, said slot terminating at one end in a laterally extending notch, means for pivotally mounting the body portion on the tong engagement means for pivotal movement in a vertical direction about a pivotal axis located to one side of the slot on a side opposite the notch and spaced no further from said one end than the centre line of the notch, and a massive elongated handle extending laterally from the body portion normally urging the latter to rotate from a vertically extending position to a horizontally extending position.

5. Tong mechanism as claimed in claim 2 in which the linking means comprises a pair of U-shaped shackles.

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