No. 768,253. PATENTED AUG. 23, 1904.

J. W. WATSON.

ADJUSTABLE TONGS.

APPLICATION FILED FEB. 4, 1904.

NO MODEL.

Fig. 1.

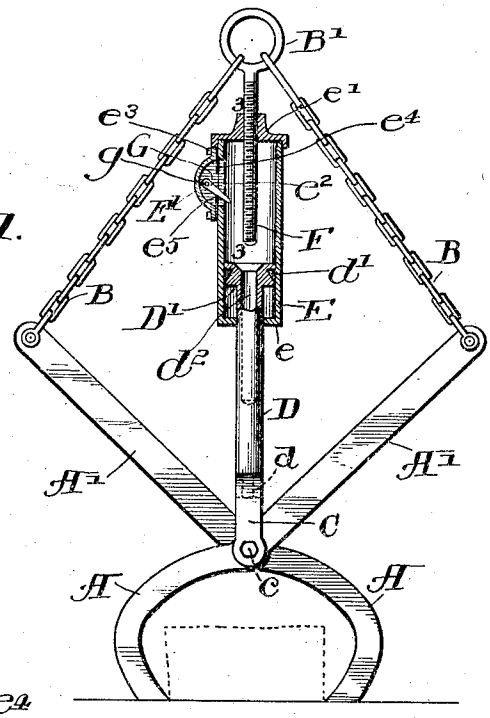



Fig. 3.

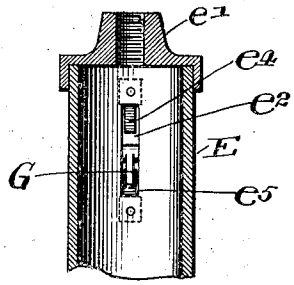
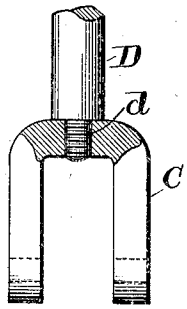



Fig. 4.



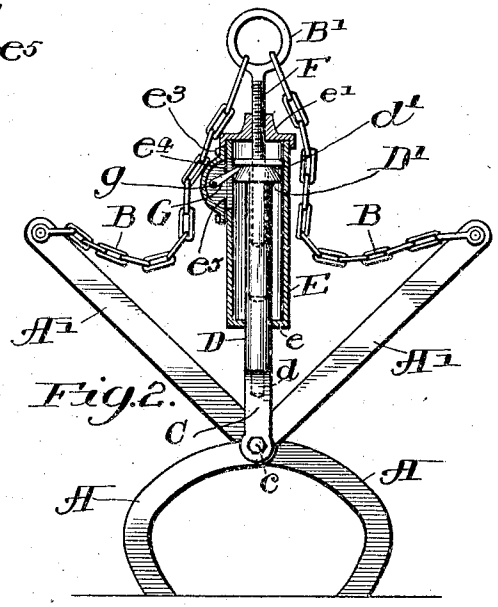




Fig. 2.

Witnesses:-
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# UNITED STATES PATENT OFFICE.

JOHN WILLIAM WATSON, OF JOHNSTOWN, PENNSYLVANIA.

## ADJUSTABLE TONGS.

SPECIFICATION forming part of Letters Patent No. 768,253, dated August 23, 1904.

Application filed February 4, 1904. Serial No. 191,986. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WILLIAM WATSON, a citizen of the United States, and a resident of Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Adjustable Tongs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in tongs designed for lifting heavy weights—such as ingots, from which are rolled bar and sheet iron, rails, &c.; and the invention relates more especially to improvements designed for adjusting the width of such tongs and also for facilitating the lifting or freeing of the tongs from the load when the load has been deposited on a supporting-base.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation, with parts shown in section, of my improved tongs, the tongs being in position to grasp the load. Fig. 2 is a like view showing the parts in position to lift the tongs from a weight or load. Fig. 3 is a detail section taken on line 3 3 of Fig. 1. Fig. 4 is a detail showing the yoke in which the tong-arms are hinged.

As shown in the drawings, A A designate the tong-arms, which cross each other and are hinged at their intersection and the upper ends A′ A′ of which are diverged, and B B lifting-chains, which are attached at their lower ends to the upper divergent ends of the tong-arms and are joined at their upper ends to a suspension-ring B′, which is adapted to be attached to a trolley depending from an overhead crane. The tong-arms are pivoted at the intersection thereof to and between the arms of a yoke or shackle C by means of a pivot-bolt *c*.

D designates a rod which is provided at its lower end with a reduced screw-threaded portion *d*, (shown in dotted lines in Fig. 1,) which enters a screw-threaded opening in the top of the yoke or shackle C, and said rod is provided at its upper end with a head D′, which is contained within and has sliding engagement with a guide E, having the form of a cylinder, as herein shown, said cylinder being provided in its lower end or head *e* with an opening through which the rod D extends. The cylinder is also provided at its upper end with a removable head or cap *e*′, having a central screw-threaded opening through which extends a screw-threaded rod or shaft F, which is rigidly connected at its upper end with the suspension-ring B′. Said ring and shaft constitutes, in effect, an eyebolt. Said guide-cylinder is provided at one side near the upper end thereof with a short longitudinally-arranged slot $e^2$, which is covered by a hollow casting E′, which is bolted to the side of the cylinder by tap-bolts $e^3$.

G designates a short vertically-swinging pawl which is hinged or loosely connected at its outer end to a horizontal pin *g*, extending transversely through the recess of said casting E′, and the inner end of said pawl extends into the cylinder through said slot $e^2$.

$e^4$ $e^5$ designate upper and lower short leaf-springs extending into the upper and lower ends respectively of said slot $e^2$ and adapted for engagement by the pawl when the latter occupies the upper and lower limits of its swing.

The piston-head D′ is provided with a circumferential groove *d*′, the lower side of which is annularly beveled, as shown in Fig. 1. The upper end of the piston-rod and the piston is provided with an axial bore $d^2$, which is adapted to receive the screw-threaded rod or bolt F when said bolt is moved endwise relatively to the rod.

The operation of the tongs is as follows: The tongs are shown in Fig. 1 in the position which they occupy when resting on a base and in position to grasp a load and also in the position which they occupy just after a load has been lowered to a supporting-base and the tongs are ready to be released there-

from. If the load is to be lifted, an upward pull on the tongs exerted through the suspension ring B′ acts through the chains B and tong-arms to pull the gripping ends of the tong-arms together, thereby clamping the tongs upon an interposed load and at the same time lifting the tongs and the load. If it be assumed that a load has just been lowered by the tongs and it is desired to release the tongs and raise them from the load after said tong-arms have touched the supporting-base and together with the rod D have been brought to rest, the lowering or descent of the guide-cylinder and rod F is continued (which is permitted by reason of the sliding engagement of the piston with the guide-cylinder) until the upper end of the piston strikes the pawl G and swings it upwardly sufficiently for the pawl to pass the upper end of the load and to permit the pawl to fall into the annular groove $d'$ of the piston. As said pawl is thus swung upwardly it strikes the upper spring $e^4$, which acts to spring it into the groove of the piston. The relative downward movement of the cylinder is now arrested, and when the cylinder is raised the pawl locks the cylinder to the piston and raises the rod D and tong-arms with the cylinder. The screw-threaded rod F, cylinder E, and piston-rod D constitute a central suspending device which is shortened in the manner described, as shown in Fig. 2, and by which the tongs are raised without bringing tension on the lifting-chains B, and therefore without closing the tong-arms, so that said tong-arms may be raised in their open position.

When another load is to be lifted, the tongs are lowered upon a supporting-base with the load between the gripping ends of the tong-arms. When said tong-arms strike the supporting-base, the piston and its rod remain stationary, while the guide-cylinder and screw-threaded rod or bolt F continue to descend relatively to the piston. Said relative descent of the guide-cylinder to the piston carries the pawl out of the groove $d'$ and permits said pawl to drop downwardly beneath the piston into its normal position against the lower spring $e^5$. When the device is thereafter raised to grasp or lift the load, the cylinder is raised relatively to the piston, so that said pawl passes the piston, the lower spring yielding to permit the pawl to spring out of the path of the piston. In the further raising of the device tension is brought upon the lifting-chains B, which closes the tong-arms upon the load in a manner to grasp or engage the load to lift it in the continued ascent of the tongs.

The tongs are adjusted to different widths of loads by turning the guide-cylinder upwardly or downwardly upon the screw-threaded shaft F. By turning said guide-cylinder to the right it will travel upwardly on said screw-threaded rod, and thereby adjust the tongs to wider loads, while turning the cylinder to the left will cause the cylinder to travel downwardly on said rod and adjust the tongs to narrower loads.

It is to be understood that the cylinder E is essentially a guide for the rod D and that such guide need not necessarily have the form of a cylinder, it only being essential that the guide be provided with upper and lower connected apertured heads for the passage of the rod D and the screw-threaded shaft F. It is to be furthermore understood if no lateral adjustment of the tong-arms be desired to adopt the same to different-width loads the shaft F need not be made adjustable relatively to the guide.

I claim as my invention—

1. Tongs comprising pivoted tong-arms which are crossed and hinged at their intersection, a suspension-ring, chains connecting said ring with the upper divergent ends of the tong-arms, and a central suspension device connected at one end directly with said ring and at its other end with the tong-arms at their hinge, said suspension device consisting of two parts which are relatively movable to lengthen and shorten the suspension device, and means for locking together the parts when the suspension device is shortened.

2. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring, lifting connections between said ring and the upper divergent ends of said tong-arms, a central suspension device which is adapted to be extended or shortened relatively to said lifting connections and means for automatically locking said suspension device when shortened and constructed to automatically release the same to permit said central suspension device to lengthen.

3. Tongs comprising pivoted tong-arms which are crossed and hinged at their intersection, a central suspension-ring, lifting devices connecting said ring with the upper divergent ends of the tong-arms, and a central suspension device, comprising a guide connected at its upper end directly with the suspension-ring, a rod connected with said tongs at their hinge and having endwise sliding engagement with the guide, and means for mechanically locking said rod to said guide when the parts are in position to shorten the central suspension device, whereby the tongs may be lifted through the medium of said suspension-ring without exerting lifting stress on the upper divergent ends of the tong-arms.

4. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring connected by lifting devices with the upper divergent ends of the tong-arms, an inclosed guide connected with and lifted by said ring, a rod connected with the hinge of said tong-arms and provided with a head which

slides in said guide, and a pawl in the upper part of said guide adapted for locking engagement with said head.

5. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring connected by lifting devices with the upper divergent ends of the tong-arms, an inclosed guide connected with and lifted by said ring, a rod connected with the hinge of said tong-arms and provided with a notched head, which slides in said guide, and a spring-pressed pawl extending through a slot in the upper part of said guide adapted for locking engagement with the notch of said head.

6. Tongs comprising crossed tong-arms, a yoke inclosing said arms at their intersection, a pivot-pin extending through said yoke and tong-arms for hinging the arms together, a suspension-ring connected by chains with the upper divergent ends of the tong-arms, an inclosed guide connected directly with and lifted by said suspension-ring, a rod attached at its lower end to said yoke and provided at its upper end with a head having endwise sliding engagement with said guide, and a locking device in the upper end of said guide adapted to engage the head.

7. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring, lifting connections between said ring and the upper divergent ends of the tong-arms, a guide-cylinder attached to and lifted by said suspension-ring, a rod connected with the hinge of said tong-arms and provided with a circular head which has sliding engagement with said cylinder, said head being provided with an annular notch, the lower side of which is beveled, and a pawl in the upper end of said guide-cylinder adapted for locking engagement with the notch of said head.

8. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring, lifting connections between said ring and the upper divergent ends of said tong-arms, a central suspension device connected with said ring which is adapted to be extended or shortened, means for locking said suspension device when shortened, whereby the tongs may be lifted thereby with the tongs open, and means for varying the gripping width of said tongs.

9. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring connected with the upper divergent ends of said arms, a rod connected with the tong-arms at their intersection, a guide with which the upper end of said rod has sliding engagement, a pawl in the upper end of the cylinder adapted to lock the rod to said cylinder and a screw-threaded rod or shaft connected with the suspension device and having screw-threaded engagement with said guide.

10. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring, lifting connections between said ring and the upper divergent ends of said tong-arms, a central suspension device comprising a guide-cylinder, a screw-threaded rod attached to said suspension-ring and having screw-threaded engagement with the upper end of said guide-cylinder, a rod connected at its lower end with the hinge of said tong-arms, and provided with a head which has sliding engagement with said cylinder, and means in the upper end of said guide for locking said head to the cylinder.

11. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring, lifting connections between said ring and the upper divergent ends of said tong-arms, a central suspension device comprising a guide-cylinder, a screw-threaded rod attached to said suspension-ring and having screw-threaded engagement with the upper end of said guide-cylinder, a rod connected at its lower end with the hinge of said tong-arms, and provided with a head which has sliding engagement with said cylinder, and means in the upper end of said guide for locking said head to the cylinder, said cylinder being rotative with respect to said head whereby it may travel upwardly and downwardly on said screw-threaded rod.

12. Tongs comprising tong-arms which are crossed and hinged at their intersection, a suspension-ring, lifting connections between said ring and the upper divergent ends of the tong-arms, a rod connected at its lower end with the hinge of said tong-arms and provided at its upper end with a head, a guide-cylinder with which said head has sliding engagement and through the lower end of which said rod extends, means at the upper end of the cylinder for locking said head to the guide-cylinder, and a screw-threaded rod connected with said suspension-ring and having screw-threaded engagement with the upper end of the guide-cylinder, said rod being provided with an axial bore to receive said screw-threaded rod.

13. Tongs comprising two tong-arms which are crossed and hinged at their intersection, a suspension-ring, lifting connections between said ring and the upper divergent ends of the tong-arms, a rod connected at its lower end with the hinge of said tong-arms and provided at its upper end with a notched, circular head, a guide-cylinder with which said head has sliding engagement and through the lower end of which said rod extends, a pivoted pawl extending into the cylinder and adapted to engage the notch of said head to lock the same in the upper end of the cylinder, and a screw-threaded rod attached to said suspension-ring and extending through and having screw-

threaded engagement with the upper end or head of the cylinder, said piston-rod being provided with an axial bore to receive the lower end of the screw-threaded rod and the cylinder being rotative relatively to said rod.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 28th day of January, A. D. 1904.

JOHN WILLIAM WATSON.

Witnesses:
SAMUEL P. STOUPPE,
JAMES V. PARTINGTON.