

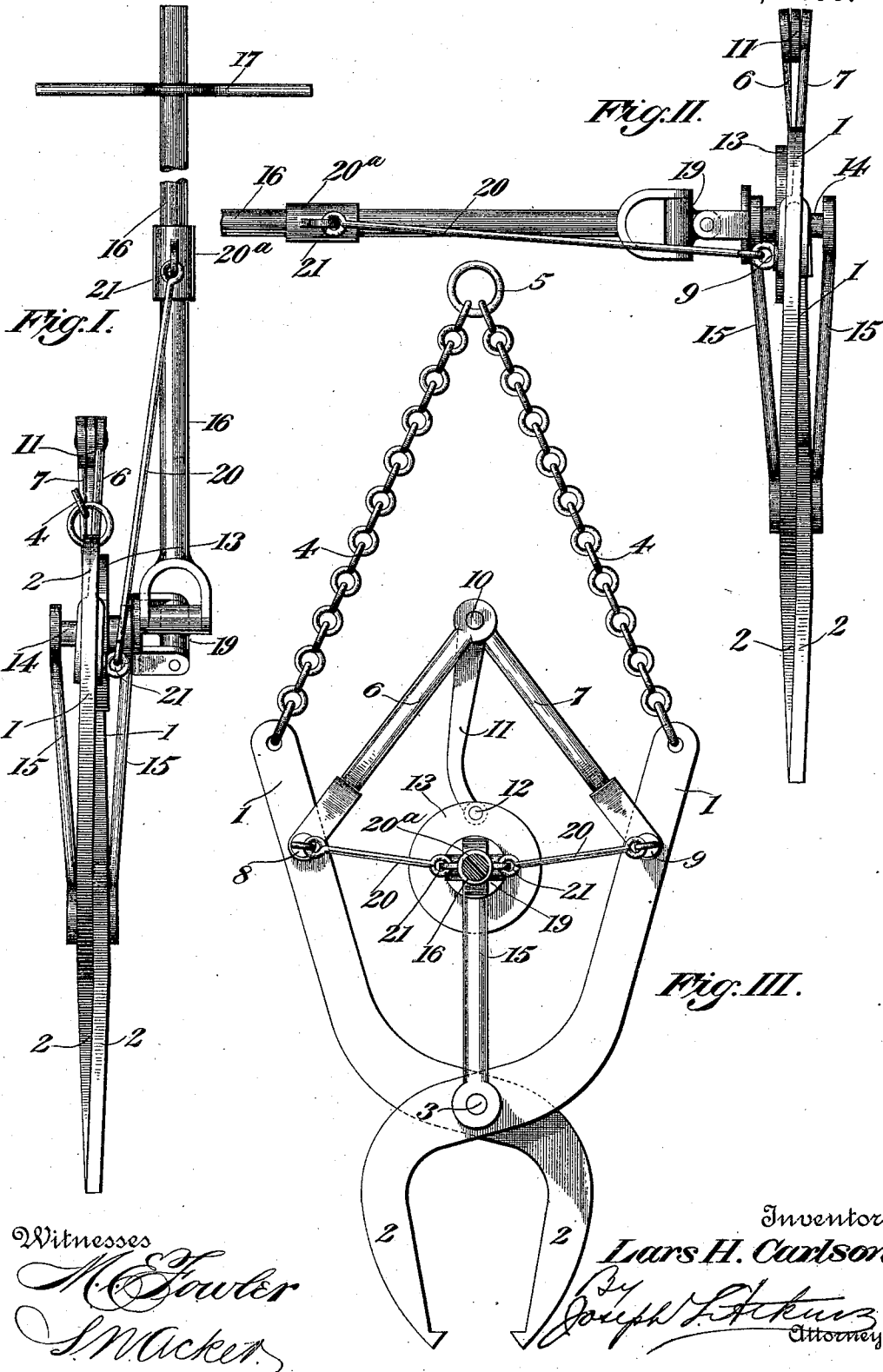
(No Model.)

2 Sheets—Sheet 1.

L. H. CARLSON.
GRAPPLE.

No. 574,133.

Patented Dec. 29, 1896.



Witnesses

M. Fowler
S. Macker

Inventor

Lars H. Carlson

Joseph L. Atkins
Attorney

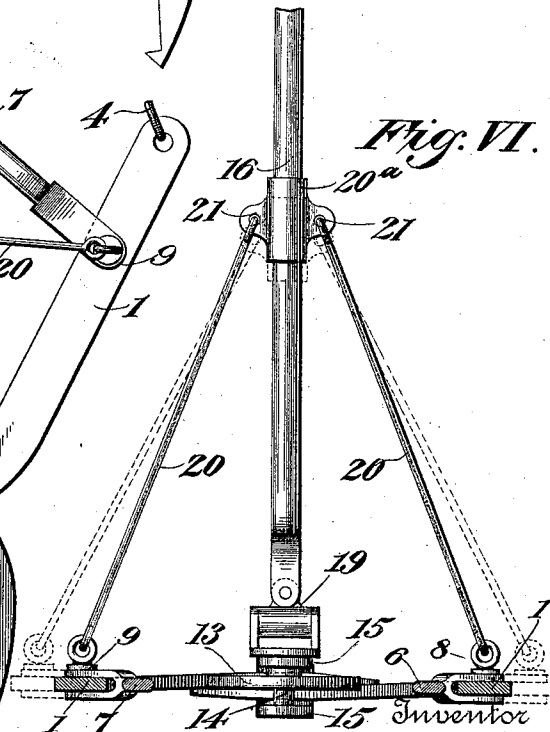
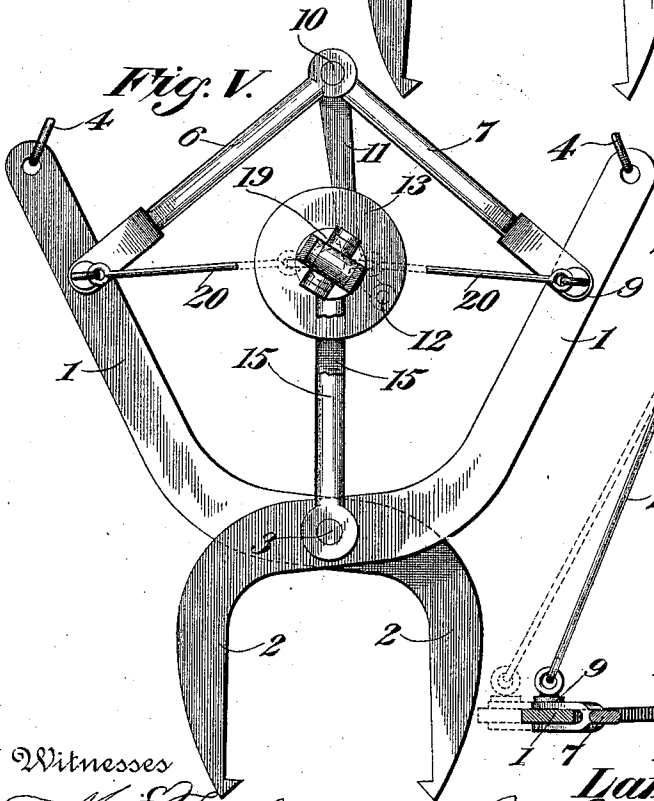
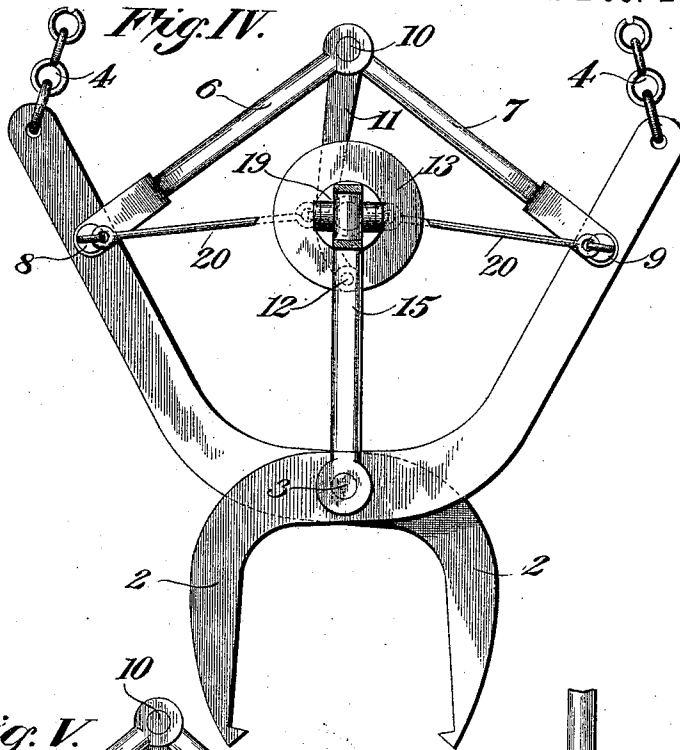
(No Model.)

L. H. CARLSON.
GRAPPLE.

2 Sheets—Sheet 2.

No. 574,133.

Patented Dec. 29, 1896.



Witnesses

McStowler
Wacker

Lars H. Carlson

By Joseph L. Atkins
Attorney

UNITED STATES PATENT OFFICE.

LARS HENNING CARLSON, OF LORAIN, OHIO.

GRAPPLE.

SPECIFICATION forming part of Letters Patent No. 574,133, dated December 29, 1896.

Application filed April 14, 1896. Serial No. 587,490. (No model.)

To all whom it may concern:

Be it known that I, LARS HENNING CARLSON, of Lorain, county of Lorain, State of Ohio, have invented certain new and useful Improvements in Grapples, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to produce an improved grapple which consists substantially in a pair of tongs with mechanism for expanding them in locations inaccessible to manual operation or under conditions which prohibit manual operation.

My invention is especially adapted for lifting ingots in and out of soaking-pits, but it may also be employed for a variety of other purposes.

In the accompanying drawings, Figure I is an edge view of my tongs suspended with the handle in the elevated position. Fig. II is a similar view with the handle at right angles to the tongs. Fig. III is a front elevation of the tongs in the closed position. Fig. IV is a similar view with the tongs expanded to the widest limit by a turn of the handle in one direction. Fig. V is a similar view with the tongs expanded by a turn of the handle in the opposite direction. Fig. VI is a transverse section of Fig. II, taken just above the handle and looking toward the handle, showing the handle-support, and in dotted lines the change of position of the handle-supporting arms when the tongs are expanded by the rotation of the handle, as indicated in Fig. V.

Referring to the figures on the drawings, 1 indicates the lever end, and 2 the grapple end, of each member of my tongs proper, which are pivotally united in the usual manner, as by a bolt or pin 3. The extremity of each of the levers 1 is secured to the respective ends of a chain or the like 4. This chain is provided with a hanging ring 5, by which the tongs may be raised and lowered and which, through the tension produced upon the chain by the weight of the tongs and their load, tends to keep the grapple ends 2 closed with a force proportionate to the weight of the tongs and their load. The ring 5 may be attached to any suitable elevating mechanism (not illustrated) adapted to raise and lower it or to transport it from place to place.

6 and 7 indicate the respective members of a toggle-joint, which are pivotally united to the respective levers 1, as indicated at 8 and 9, respectively, and to each other, as indicated at 10. The length of the members 6 and 7 is such as to cause them to maintain an angle with respect to each other at the farthest limit of expansion of the levers 1, in consequence whereof they constitute a permanent supporting element for a kind of arm or pitman 11, that is pivotally united to both members, being preferably carried between the members at their junction upon their pivot-pin 10. The arm 11 is preferably curved at its lower end and is pivotally united, as indicated at 12, to an eccentric oscillatory member 13. The member 13 is preferably disk-shaped, the connection 12 between it and the arm 11 being near its margin. It is fixed to an axle 14, that is movably mounted in two arms 15, that are secured upon opposite sides of the tong members, as by the pin 3, and which, in bearings at the opposite ends of the axle 14, support it in an oscillatory manner.

It is apparent that the oscillation of the disk 13 will increase or diminish, as the case may be, the distance between the points 3 and 10, and that as those points approach each other the toggle-joint, composed of the members 6 and 7, forces the levers 1 apart and expands the grapple ends 2, while, on the contrary, as the points 3 and 10 recede from each other the contrary effect is produced. By this means the grapples may be opened to receive and adjusted to a load, as, for example, an ingot, so that when adjusted the ingot may be lifted by the aid of the chain 4, or, after having been lifted or transported, it may be separated from the tongs by expanding them and exerting a lifting force upon the chain 4.

It will be perceived from the foregoing description that any means may be employed for rotating the shaft 15 and that the simplest means will be serviceable for that purpose, while the tongs are heated by contact with hot metal, or where they are located, so that they cannot be readily manipulated. As suggested at the outset, however, I propose to use my tongs especially under conditions which compel them to be used upon a different level than that on which the operator stands. For

that reason I prefer to employ the particular mechanism for oscillating the shaft 14 that is shown in the drawings. That mechanism consists of a rod 16, preferably provided at its outer extremity with a handle 17, and which is united to the axle 14 by a universal joint, such, for example, as the gimbal-joint 19 illustrated. I prefer also to employ in connection with the rod 16 guide-rods 20, loosely secured at their opposite ends to the levers 1, being fastened, preferably, to the pivot-pins 8 and 9, which secure them to the members 6 and 7, respectively. The guide-rods are loosely secured at their opposite ends to the opposite sides of the collar or sleeve 20, as indicated at 21, the sleeve 20 encircling the rod and allowing the free and independent movement thereof within it.

By aid of the mechanism described the tongs may be operated when the handle is in the horizontal position illustrated in Fig. II, or it may be operated when the tongs are elevated or depressed to a high or low level, the former condition being illustrated in Fig. I of the drawings.

What I claim is—

1. The combination with a pair of tong-levers and their pivot, of the two members of a toggle-joint, pivotally united to each other and to the tong members, respectively, and of a length sufficient to cause them to maintain an angle with respect to each other at the farthest limit of expansion of the tong-levers, an oscillatory member operatively connected with the tong-levers, an arm pivotally united to the pivot-pin of the toggle-joint members, and eccentrically pivoted to the oscillatory member, and means for imparting motion to the oscillatory member, substantially as and for the purpose specified.

2. The combination with a pair of tong-

levers and their pivot, of a pair of toggle-joint members pivotally united to each other, and to the tong-levers, respectively, arms loosely secured at one end to the pivot which unites the tong-levers, an oscillatory member pivotally secured to said arms between the tong-pivot and the toggle-joint pivot, and an arm eccentrically pivoted to the oscillatory member at one end and pivotally united at the other end to the toggle-joint pivot-pin, and means for actuating the oscillatory member, substantially as set forth.

3. The combination with a pair of tong-levers and their pivot, of a pair of toggle-joint members pivotally united to each other and to the tong-levers, respectively, an oscillatory member pivotally confined between the tong-lever pivot and toggle-joint pivot, an arm eccentrically pivoted to the oscillatory member and pivoted to the toggle-joint pivot, and means for actuating the oscillatory member, substantially as set forth.

4. The combination with a pair of tong-levers and their pivot, of a pair of toggle-joint members, pivotally united to each other and to the tong-levers, respectively, arms movably secured at one end to the pivot which unites the tong-levers, and pivotally supporting at their opposite ends an oscillatory member, and a curved arm eccentrically pivoted to the oscillatory member at one end, and pivotally united at the other end to the pivot-pin of the toggle-joint members, and means for actuating the oscillatory member, substantially as set forth.

In testimony of all which I have hereunto subscribed my name.

LARS HENNING CARLSON.

Witnesses:

GEO. S. GLITSET,
W. G. BLISS.