(No Model.) 2 Sheets—Sheet 1.

A. C. DINKEY.

TONGS OPERATING APPARATUS.

No. 539,982. Patented May 28, 1895.

Fig. 1.

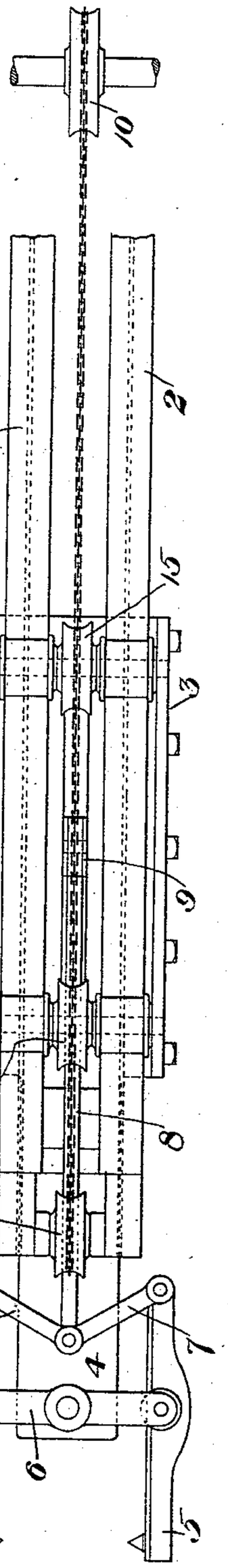
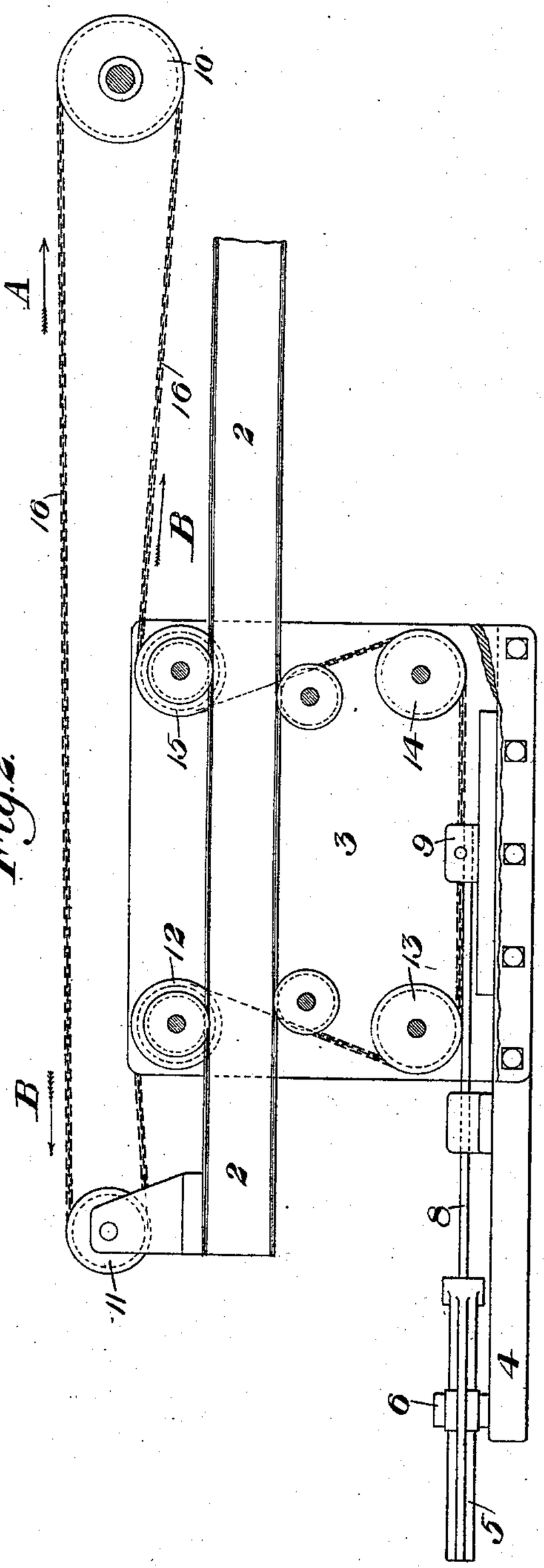


Fig. 2.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

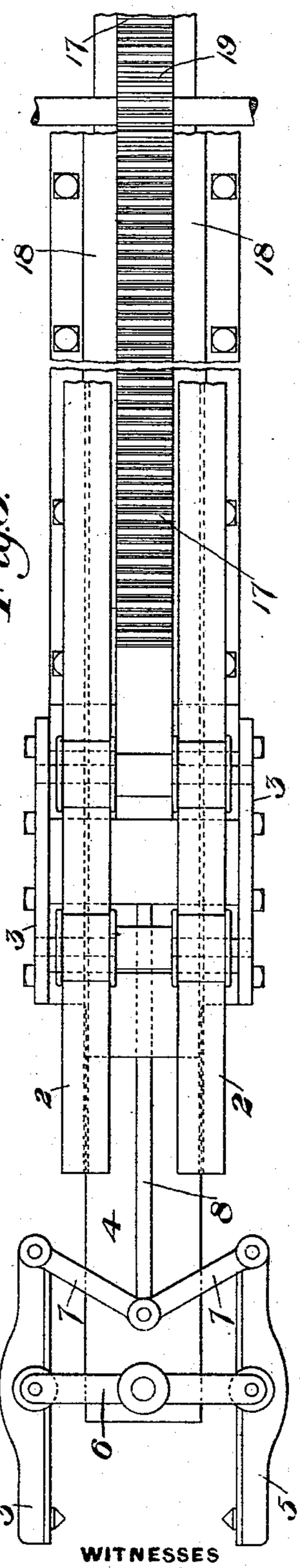


Fig. 5.

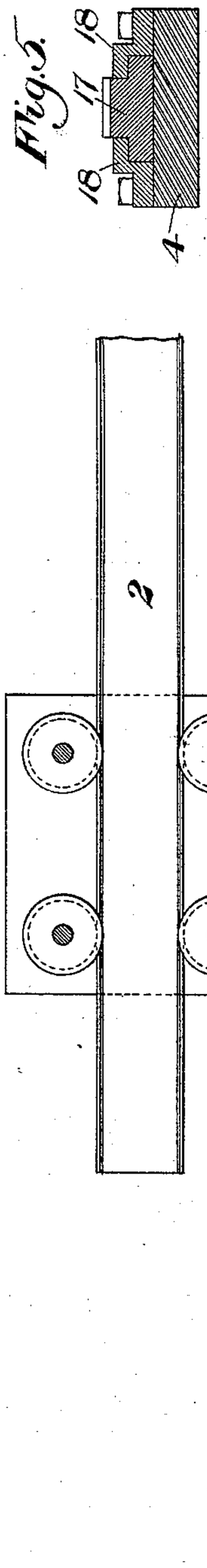


Fig. 4.

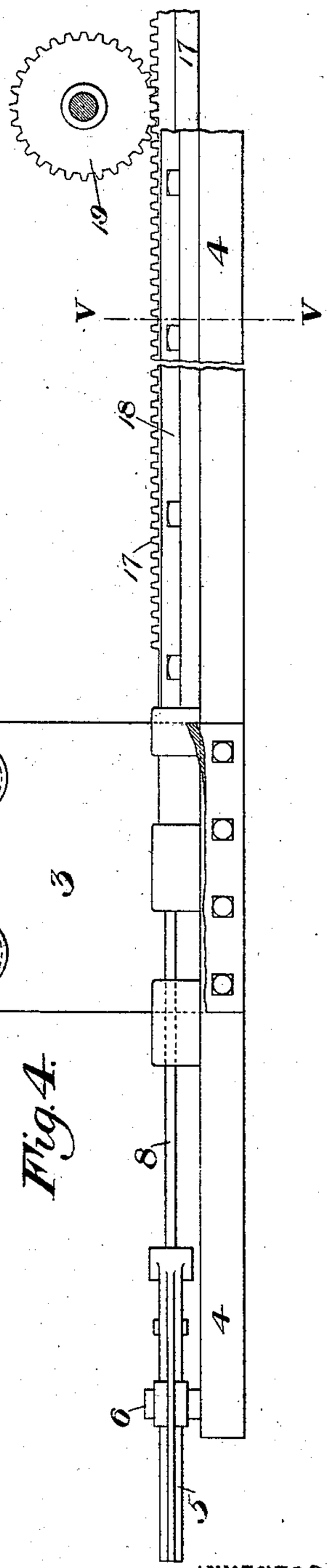
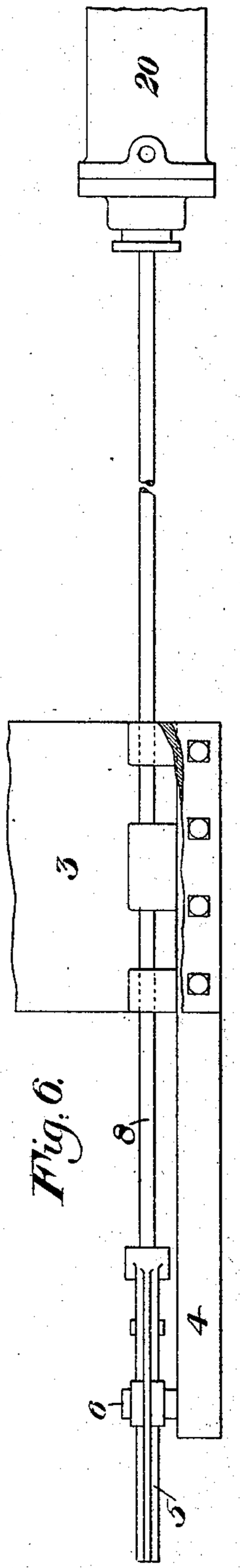


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

ALVA C. DINKEY, OF MUNHALL, PENNSYLVANIA.

TONGS-OPERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 539,982, dated May 28, 1895.

Application filed March 19, 1895. Serial No. 542,323. (No model.)

To all whom it may concern:

Be it known that I, ALVA C. DINKEY, of Munhall, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tongs-Operating Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of the preferred form of my improved apparatus. Fig. 2 is a side elevation thereof. Fig. 3 illustrates in plan view a modification of my invention. Fig. 4 shows the same in side elevation. Fig. 5 is a partial cross-section on the line V V of Fig. 4. Fig. 6 is a side elevation of another modification.

Like symbols of reference indicate like parts in each figure.

In the drawings, 2 represents the jib of a crane. It may be the projecting jib of a rotary crane, the jib or beam of a traveling buggy or car or traveling crane, or other carrier designed to convey blooms or ingots of metal to or from a furnace. On said jib is mounted a trolley or carrier 3, which is adapted to move back and forth on wheels or slides, and carries a frame or base 4 on which are the jaws 5 of tongs, pivoted either directly to the frame or to a cross-head 6 thereon. These jaws are opened and closed by toggle-levers 7, connected by a rod 8 to a sliding head 9 on the frame 4.

To move the sliding head 9 when desired, and also to move the trolley back and forth upon the jib, I employ the following mechanism:—10 is a sprocket-wheel journaled on the jib and adapted to be rotated by a suitable motor. An electric motor or a steam or hydraulic or other engine may be used for this purpose. There is another sprocket-wheel 11 journaled at an advanced point on the jib, and on the trolley there are wheels or sheaves 12, 13, 14, and 15. An endless sprocket-chain 16 passes in succession around the wheels 10 and 11 and around the wheels on the trolley and is secured to the sliding head 9.

To close the jaws of the tongs upon an ingot, the operator causes the motor to run so as to rotate the sprocket-wheel 10 and to move the chain 16 in the direction of the arrow B. The inertia of the trolley is such that at first the chain will pass freely around the wheels 10, 11, 12, 13, 14 and 15, and will retract the sliding-head 9, thus spreading the toggle-levers and closing the jaws of the tongs upon the ingot. The inertia of the trolley is sufficient to cause the chain to travel over the wheels 12, 13, 14, and 15 without moving the trolley on the jib, but when the tongs engage the ingot, the resistance which is thus afforded to the sliding-head 9 blocks the movement of the chain around the wheels on the trolley, and further motion of the chain in the direction above indicated will draw the trolley back and cause it to travel on the jib. If it be desired to advance the trolley on the jib, after the tongs have engaged the metal, a pin or other suitable stop is placed in front of the sliding-head 9 so as to lock it, and the sprocket-chain is then moved in the direction of the arrow A by reversal of the motor.

To open the jaws of the tongs, the stop is removed from the front of the sliding-head and in operating the motor so as to move the chain in the direction of the arrow A, the sliding head will be moved forward and by means of the rod 8 will operate the toggle-arms so as to spread the jaws. Further motion of the sprocket-chain in the same direction will then advance the trolley on the jib.

Instead of the chain connection shown in Figs. 1 and 2, I may employ the rigid connections shown in Figs. 3, 4, 5 and 6. In the form of Figs. 3, 4 and 5, I employ a rack-bar 17 to which the rod 8 is secured, and which is reciprocated within suitable guides 18 by a gear-wheel 19 intermeshing therewith and actuated by a suitable motor. In Fig. 6 I illustrate a form wherein the piston-rod of the motive cylinder 20 is secured directly to the rod 8. In either form, the operation is exactly similar to that previously described.

The advantages of my invention will be appreciated by those skilled in the art.

It will be noticed that the mechanism can be operated so as to open or close the jaws no matter where the trolley may be on the jib, and it also enables the trolley to be moved back and forth so as to deliver the metal to or to draw it from a heating furnace, to pick it up from the floor or from a car, or to deliver it to the feed-table of a rolling-mill.

Within the scope of my invention as de-

fined in the claims, various modifications may be made in the form and construction of the parts, and some of the elements of my apparatus may be used independently of the others.

I believe that I am the first to devise means for operating tongs on a movable carrier by means of operating mechanism connected therewith by a traveling connection, and I intend to claim the same broadly *inter alia*.

I claim—

1. The combination of tongs, a movable carrier on which the tongs are mounted, and by which they are moved toward and from a furnace, and tongs-operating mechanism situate at a point off the carrier, but operatively connected with the tongs by a traveling connection.

2. The combination of a carrier, tongs carried thereby, and an endless flexible connection extending around sheaves on the carrier and around mechanism situate at a point off the carrier.

3. The combination of a carrier, tongs carried thereby, and an endless flexible connection extending around sheaves on the carrier and around mechanism situate at a point off the carrier, and connected with a sliding head on the carrier, which sliding head is operatively connected with the tongs.

4. The combination of a jib, a carrier, tongs on the carrier, and a driven flexible endless connection extending around sheaves on the jib and around sheaves on the carrier, and connected with the tongs.

In testimony whereof I have hereunto set my hand.

ALVA C. DINKEY.

Witnesses:
THOMAS W. BAKEWELL,
H. M. CORWIN.