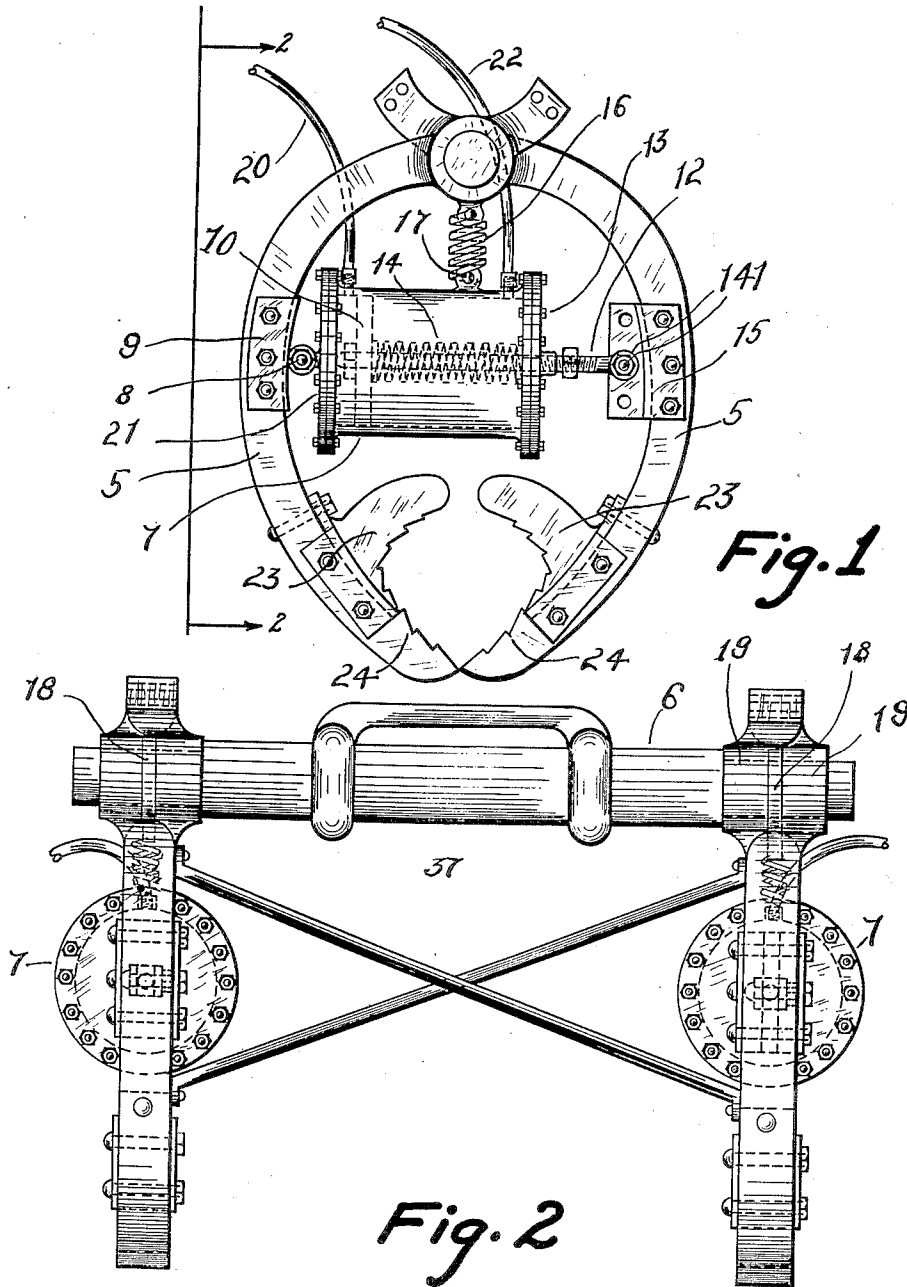


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POWER OPERATED TONGS.
APPLICATION FILED MAR. 14, 1919.

1,346,160.

Patented July 13, 1920.
2 SHEETS—SHEET 1.



Inventor
S. E. Barlow.

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Attorney

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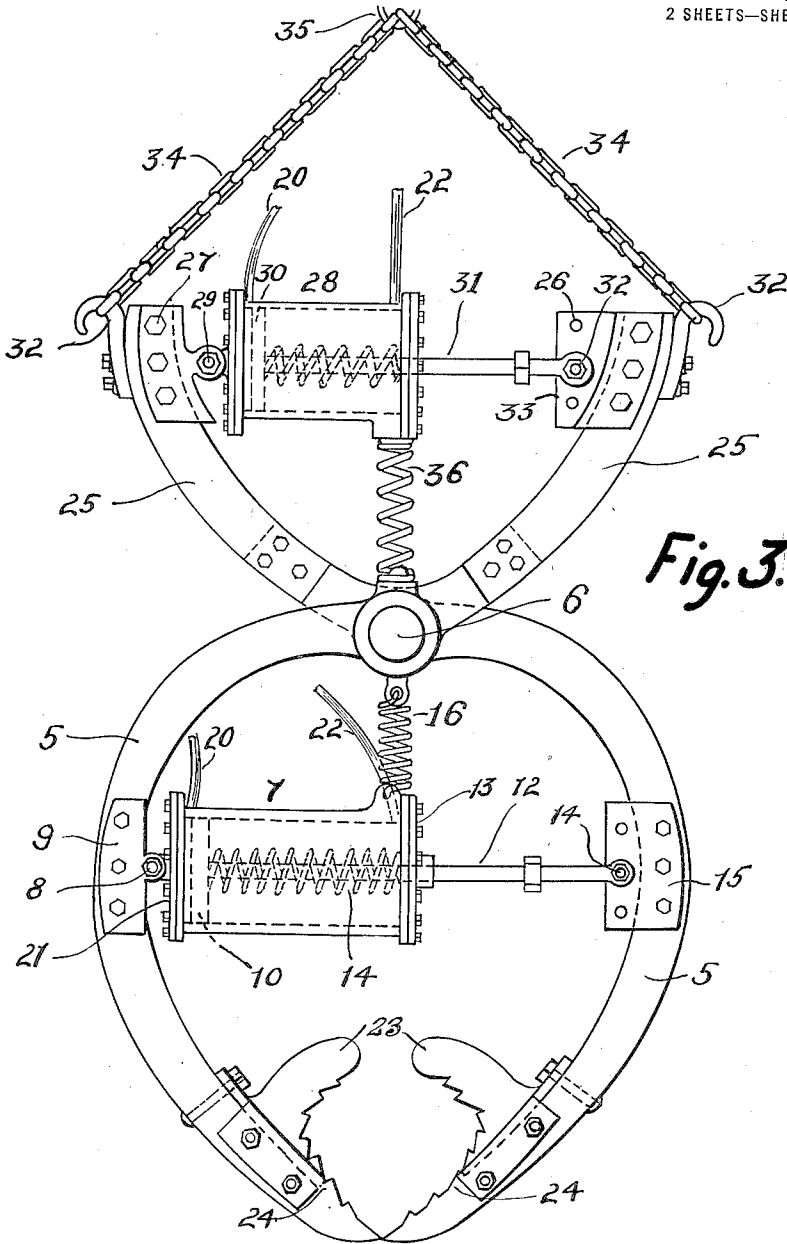


Fig. 3.

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UNITED STATES PATENT OFFICE.

SAMUEL E. BARLOW, OF DENVER, COLORADO.

POWER-OPERATED TONGS.

1,346,160.

Specification of Letters Patent. Patented July 13, 1920.

Application filed March 14, 1919. Serial No. 282,620.

To all whom it may concern:

Be it known that I, SAMUEL E. BARLOW, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Power-Operated Tongs; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in tongs for doing relatively heavy work, and more especially intended for handling relatively long articles, as railway rails, which must be picked up along the right of way and loaded on cars.

One object in producing this invention is to handle articles of this character in numbers at a single load and in such a manner that they are held in parallel relation, and to this end I employ a number of pairs of jaws, these pairs being suitably spaced and hingedly connected with an axle, the spaced jaws on the same side of the structure being connected with each other and suitably braced in order to give the required strength and durability.

In all forms of my invention I employ cooperating cylinders and pistons, or other suitable motors, which are connected with fluid, as air under pressure, for operating the jaws of the tongs. In one form of the invention I employ a cylinder and piston for each pair of tongs, the piston of one cylinder having its stem or rod pivotally connected with one of the jaws, while the other jaw is pivotally connected with the adjacent head of the cylinder. Then, as fluid under pressure, as air, is introduced into the cylinder in the rear of the piston, the piston will be moved in the cylinder and the two jaws will be simultaneously actuated for opening purposes. The cylinders may be arranged within the jaws, or they may be located above the jaws and connected with the handles or reins of the jaws; or cylinders in both positions may be simultaneously employed if it should be desirable to do so.

Having briefly outlined my improvement, I will proceed to describe the same in detail, reference being made to the accompanying

drawing in which is illustrated an embodiment thereof. In this drawing:

Figure 1 is an elevation of one form of my improved tongs.

Fig. 2 is a side view of the same, or a view looking in the direction of arrows 2, Fig. 1.

Fig. 3 is an end view, showing a modified form of construction.

The same reference characters indicate the same parts in all the views.

Referring first to Figs. 1 and 2, let the numeral 5 designate each of the individual jaws of two pairs of tongs, these pairs being suitably spaced and journaled on an axle 6. Between the individual members of each pair of jaws is located a cylinder 7, one head of which is pivotally connected as shown at 8 with a bracket 9 mounted on the adjacent jaw. Within this cylinder is located a piston 10, having a rod, 12, which projects through the head 13 of the cylinder, its outer extremity being pivotally connected as shown at 141, with a bracket 15, secured to the adjacent jaw. The piston rod within the cylinder is surrounded by a spiral spring, 14, which is under normal tension to close the piston or move it to the position corresponding with the closed position of the jaws.

In order to support the extremity of the cylinder remote from the hinge 8 when the jaws are opened, I employ a spiral spring, 16, which is connected at one extremity with the cylinder, as shown at 17, and at its opposite extremity with a ring, 18, surrounding the axle and arranged between the eyes, 19, of the two jaws, 5, at the same end of the axle.

Assuming that the jaws are closed, air under pressure may be introduced through a pipe, 20, into the cylinder between the head 21 and the piston, with the result that the cylinder and piston are moved in opposite directions and the two jaws 5 simultaneously opened or caused to travel in opposite directions, the movement being from the axis of the axle 6. For the purpose of closing the jaws, fluid, as air under pressure, may be introduced into the opposite end of the cylinder through a pipe 22, though the spring 14 has a tendency to close the jaws and will serve for this purpose unless there is considerable resistance.

In Figs. 1 and 2 the lower portions of the

jaws 5 are equipped with inwardly projecting lugs, 23, which form a chamber, when the jaws are closed in which the material to be carried is located. These lugs are preferably toothed or roughened in order to give a better holding or grasping capacity. This toothed condition of the lugs is also continued, as shown at 24, at the lower ends of the jaws.

In the form of construction shown in Fig. 3, there is a cylinder, 7, located between each pair of jaws 5, and this is substantially the same as the cylinders 7 in Figs. 1 and 2. However, in the construction shown in Fig. 3, each jaw 5 is continued to form handles or reins, 25, the handle 25 on the left, being continuous with the jaw 5 on the right. In other words, the jaws and their corresponding handles or reins are arranged shears-fashion, and cross each other at the axle 6. The handles 25 are continued upwardly and equipped with brackets, 26 and 27. To the bracket 27, one head of a cylinder 28 is pivotally connected, as shown at 29, while the piston 30, within the cylinder, is provided with a stem, 31, which is pivotally connected, as shown at 32, with a bracket 33, connected with the adjacent rein or handle 25. The upper extremity of each handle 25 is provided with a hook, 32, which makes it practicable to lift the tongs by means of chains, 34, respectively connected with these hooks and connected at their outer extremities by a ring, 35, with which a hook (not shown) of the lifting apparatus may be connected.

In this form of construction a spring, 16, forms a support for the cylinder, 7, the same as illustrated in Figs. 1 and 2, while another spring, 36, is connected with one extremity of the cylinder, 28, and affords the necessary support for the latter. The two springs 16 and 36 may be connected with the same ring, 18, the latter being clearly disclosed in Fig. 1. The pistons in the cylinders 7 and 28 are operated by fluid pressure and will be connected with the pipes 20 and 22, the same as illustrated in Figs. 1 and 2.

For lifting the tongs a loop, 37, may be connected with the central portion of the axle 6, as shown in Fig. 2, while in the form of construction shown in Fig. 3, the lift may be either from the axle or from the extremities of the handles or reins, 25, as heretofore explained.

It should also be explained that this construction, instead of consisting of tong arms for lifting long articles as railroad rails, may be constructed to lift fine or granular material, as dirt, gravel, sand, etc., and hence used for excavating purposes if desired without in any way departing from the spirit of the invention. It is evident that by connecting two pairs of spaced tong arms by metal members which will close the space

between the tong arms, receptacles for fine or granular material may be formed and the jaws or members of these receptacles would be operated in the same manner as where the tong arms alone are employed.

Furthermore, it should be explained that it is believed liable to mount a motor upon tong arms, or excavating shovels or receptacles for holding granular material, and hence the invention is broad enough to cover any construction of motor, whether the same consists of a cylinder and piston or other form.

I claim:

1. In power-operated tongs, the combination with a pair of tong jaws, of a cylinder and piston respectively connected with and carried by said jaws for operating purposes.

2. In power-operated tongs, the combination with an axle of a pair of tong jaws, journaled on the axle, a cylinder arranged between the jaws and having one extremity pivotally connected with one jaw, and a piston within the cylinder provided with a stem whose outer extremity is pivotally connected with the other jaw.

3. In power-operated tongs, the combination with an axle of a pair of tong jaws journaled on the axle and arranged in cooperative relation, a cylinder arranged between the two jaws, one head of the cylinder being pivotally connected with one jaw, a piston in the cylinder, a stem connected with the piston and extending through the opposite head of the cylinder, its outer extremity being pivotally connected with the other jaw, and means for yieldingly supporting one extremity of the cylinder from the said axle.

4. In power-operated tongs, the combination with an axle of a pair of tong jaws journaled on the axle and arranged in cooperative relation, a cylinder arranged between the two jaws, one head of the cylinder being pivotally connected with one jaw, a piston in the cylinder, a stem connected with the piston and extending through the opposite head of the cylinder, its outer extremity being pivotally connected with the other jaw, and means for yieldingly supporting one extremity of the cylinder from the said axle, said means comprising a spiral spring.

5. In power-operated tongs, the combination with an axle of a pair of jaws journaled on the axle, a cylinder arranged between the two jaws and having one head pivotally connected with one jaw, a piston in the cylinder, a stem connected with the piston and extending through the opposite head, its outer extremity being pivotally connected with the other jaw, and means for introducing fluid pressure into the cylinder on opposite sides of the piston for operating purposes.

6. In power tongs, the combination with

an axle, of a plurality of pairs of jaws journaled on the axle, the individual members of each pair of jaws being oppositely disposed and arranged in cooperative relation, 5 a cylinder arranged between each pair of jaws, one end of the cylinder being pivotally connected with one jaw, a piston in the cylinder, a stem connected with the piston and extending through the opposite head of 10 the cylinder, the outer extremity of the stem being pivotally connected with the other jaw, each pair of jaws having lugs arranged between the free extremities of the jaws and the cylinder to protect the latter from interference with the load. 15

7. Power tongs, composed of a plurality of spaced pairs of jaws, an axle upon which the jaws are journaled, and a power cylinder mounted on each pair of jaws.

20 8. Power tongs, composed of an axle, a pair of jaws pivotally mounted on the axle and having reins extending above the axle, a cylinder having one extremity pivotally connected with one of the reins, a piston in 25 the cylinder, and a stem connected with the piston, the outer extremity of the stem being pivotally connected with the other rein.

9. Power tongs, composed of an axle, a pair of jaws pivotally mounted on the axle 30 and having reins extending above the axle, a cylinder having one extremity pivotally connected with one of the reins, a piston in the cylinder, a stem connected with the piston, the outer extremity of the stem being 35 pivotally connected with the other rein, a second cylinder arranged between the jaws of the tongs, one head of the cylinder being operatively connected with one jaw, a piston in the cylinder, and a piston stem whose 40 outer extremity is operatively connected with the other jaw.

10. Power tongs, composed of an axle, a pair of jaws pivotally mounted on the axle and having reins extending above the axle, a 45 cylinder having one extremity pivotally connected with one of the reins, a piston in the cylinder, a stem connected with the piston, the outer extremity of the stem being pivot-

ally connected with the other rein, a second cylinder arranged between the jaws of the 50 tongs, one head of the cylinder being operatively connected with one jaw, a piston in the cylinder, and a piston stem whose outer extremity is operatively connected with the 55 other jaw, each of the cylinders being yieldingly connected with the axle to prevent undue wear of the parts.

11. Power tongs, consisting of a plurality of pairs of jaws suitably spaced, an axle on which the jaws are journaled, each pair of 60 jaws having reins, a power cylinder and piston connected in operative relation with the reins of each pair of jaws.

12. Power tongs, consisting of a plurality of pairs of jaws suitably spaced, an axle on which the jaws are journaled, each pair of 65 jaws having reins, a power cylinder and piston connected in operative relation with the reins of each pair of jaws, a second cylinder and piston connected in operative relation 70 with each pair of jaws and arranged between the latter, and means for introducing fluid pressure on opposite sides of the piston of each cylinder, to cause the two cylinders and pistons to work in cooperative re- 75 lation.

13. In power-operated lifting means, the combination with a pair of jaws of a cylinder and a piston both the piston and the cylinder being mounted on and carried by said 80 jaws for operating purposes.

14. In power-operated lifting means, the combination with a pair of jaws, of a cylinder and piston mounted on said jaws for 85 operating purposes, and lugs arranged on the jaws between the free extremities thereof and the cylinder to protect the latter from interference by the load.

15. Power tongs comprising a plurality of spaced pairs of jaws, an axle upon which 90 the jaws are journaled, and a power cylinder and piston connected with and carried by each pair of jaws.

In testimony whereof I affix my signature.

SAMUEL E. BARLOW.