

No. 629,795.

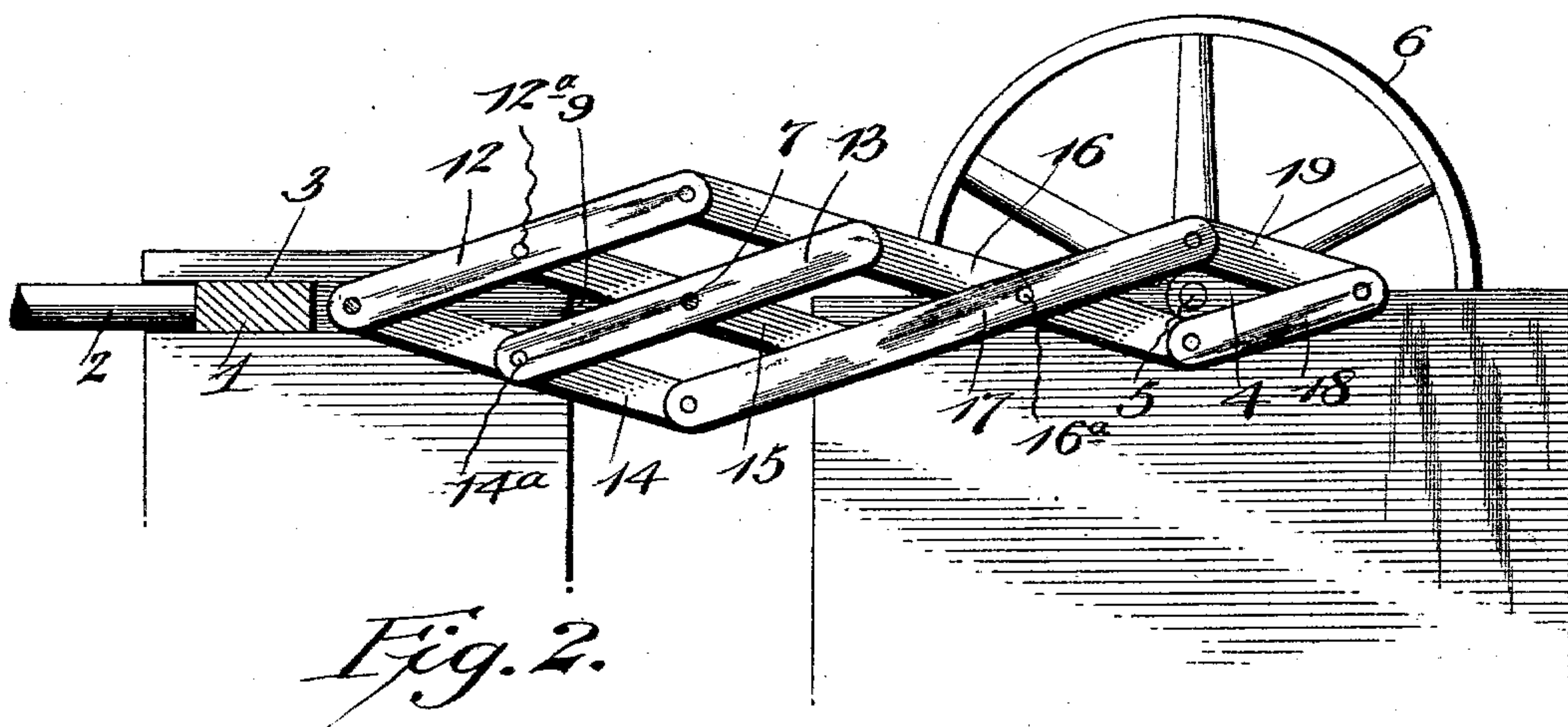
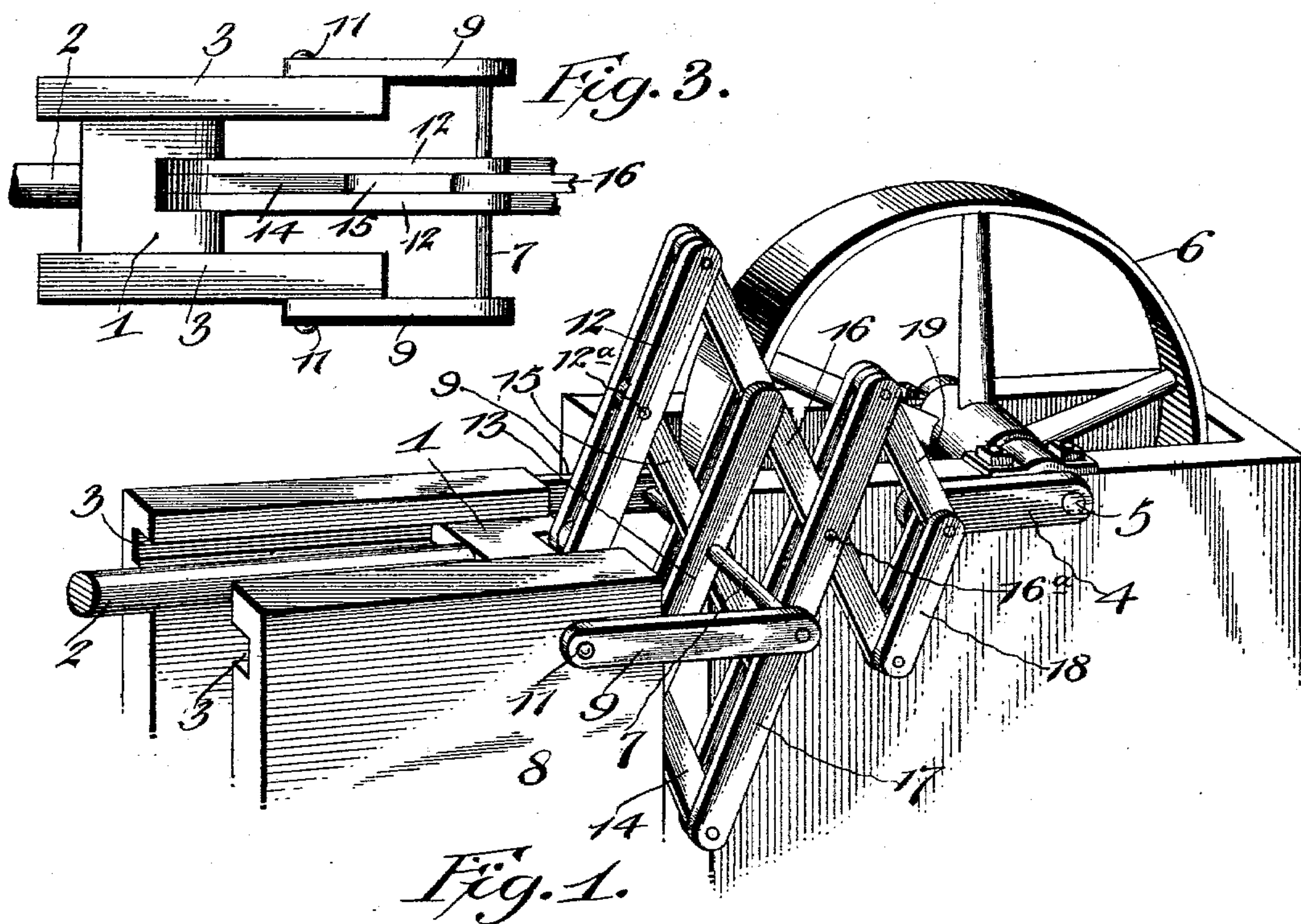
Patented Aug. 1, 1899.

R. G. LINN.

PITMAN.

(Application filed Oct. 19, 1898.)

(No Model.)



Witnesses

A. Roy Appleman

J. F. Riley

Robert G. Linn, Inventor.

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# UNITED STATES PATENT OFFICE.

ROBERT GEORGE LINN, OF SAWDUST VALLEY, TENNESSEE, ASSIGNOR OF  
ONE-HALF TO LEBAN ADAMS TRUITT AND HARRY LOVE TRUITT, OF  
NASHVILLE, TENNESSEE.

## PITMAN.

SPECIFICATION forming part of Letters Patent No. 629,795, dated August 1, 1899.

Application filed October 19, 1898. Serial No. 693,996. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT GEORGE LINN, a citizen of the United States, residing at Sawdust Valley, in the county of Maury and State of Tennessee, have invented a new and useful Pitman, of which the following is a specification.

The invention relates to improvements in pitmen.

The object of the present invention is to improve the construction of that class of pitmen employing a lazy-tongs arrangement of levers and to provide a simple one capable of transmitting the full measure of power on a crank as long as the stroke of the piston.

The invention consists in the construction and novel combination and arrangement of parts, as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a pitman constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view. Fig. 3 is a plan view of a portion of the pitman, illustrating the arrangement of the oscillating arms or bars.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a cross-head of a piston-rod 2, mounted in suitable guides or ways 3 and connected by a lazy-tongs system of levers with a crank 4 of a shaft 5, upon which is mounted a fly-wheel 6; but instead of connecting the lazy-tongs system of levers with a crank it may be pivoted to a wrist-pin of a drive wheel or pulley, as will be readily understood. One end of the system of levers is connected directly to the cross-head 1 and the other end of the system is similarly connected to the crank 4, and this direct arrangement enables the full power of an engine to be transmitted to the machinery to be operated.

The lazy-tongs system of levers comprises the short levers 12 and 14, which are pivoted at their outer ends to the cross-head, the long levers 16 and 17, the connecting-bars 13 and 15, and the toggle-links 18 and 19, extending from the outer ends of the levers 16 and 17 to the crank. The inner ends of the

levers 12 and 14 are pivotally connected to the inner terminals of the long levers 16 and 17, which are fulcrumed at 16<sup>a</sup> at a point between their ends, and the said levers 12 and 14 are pivotally connected or fulcrumed at points between their ends at 12<sup>a</sup> and 14<sup>a</sup> on the adjacent ends of the connecting-bars 13 and 15, which centrally cross each other, being disposed parallel with the levers 12 and 14, respectively.

The levers 12 and 14 are twice the length of the stroke of the piston, the distance between the pivot-points of these levers being equal to the length of the stroke, and the levers 16 and 17, which are not pivoted to the adjacent ends of the bars 13 and 15, have their longer arms twice the length of the stroke and their shorter arms are of the same length as the stroke. The cross-head is preferably provided with a recess to receive the adjacent ends of the levers 12 and 14, and the levers 16 and 17 and the bars 13 and 15, which are parallel with one another, are preferably duplicated and located at opposite sides of the other members of the lazy-tongs system of levers. The distance between the pivots of the bars 13 and 15 is equal to the length of the stroke of the piston.

As the piston reciprocates the lazy-tongs system of levers expands and contracts incident to the rectilinear movement of the cross-head, and it is vibrated or oscillated vertically through the rotation of the crank 4. In order to accommodate the system of levers to this oscillatory movement, a swinging or oscillating fulcrum is provided, and it consists of a transverse rod 7, passing centrally through the cross-bars 13 and 15, and a pair of oscillating bars or arms 9, which are connected with the frame or support 8 at a point opposite the pin of the cross-head when the same is midway the length of the stroke. The arms 9 oscillate on the pivot 11 to accommodate the fulcrum-rod to the vertical movement of the lazy-tongs system of levers, and by connecting the same directly to the cross-head and to the crank the intermediate connecting-rod usually employed at one end or the other of the system of lazy-tongs levers is dispensed with, and the leverage is ren-



dered more direct. The oscillating bars are one and one-third times the length of the stroke of the cross-head, and the oscillating fulcrum-rod is located twice the distance  
5 from the crank that it is from the cross-head.

The invention has the following advantages: The lazy-tongs system of levers, which is connected directly to the cross-head and the crank, dispenses with the connecting-rod  
10 usually employed in such arrangement and transmits the full measure of the power on a crank as long as the stroke of the piston. The swinging fulcrum oscillates vertically with the lazy-tongs system of levers, and by  
15 duplicating the members, as before described, the strain on the pivots is equalized and is central, so that there is no liability of the pivots twisting.

What is claimed is—

20 1. In a device of the class described, the combination of a lazy-tongs system of levers designed to be connected with a cross-head and comprising the short levers 12 and 14 pivoted together at their outer ends, the long  
25 levers 16 and 17 pivoted together near their outer ends and having their inner terminals connected to the inner ends of the levers 12 and 14, the crossed bars 13 and 15 pivoted to the levers 12 and 14 at the centers thereof,  
30 and the toggle-links connected with the outer ends of the levers 16 and 17, and an oscillating or swinging fulcrum connected with the bars 13 and 15, substantially as described.

2. In a device of the class described, the  
35 combination of the short levers 12 and 14 pivoted together at their outer ends and designed to be connected with a cross-head, the long levers 16 and 17 pivoted together near their outer ends and having their inner ter-  
40 minals connected with the inner ends of the short levers, the toggle-links arranged at an

angle to the outer portions of the long levers, pivoted to the same and having their outer ends pivotally connected together and de-  
45 signed to be attached to a crank, and an oscillating fulcrum connected with the levers, substantially as described.

3. In a device of the class described, the combination of the short levers 12 and 14  
50 pivoted together at their inner ends and designed to be connected with a cross-head, the long levers fulcrumed between their ends and having their inner ends connected with the short levers and designed to be connected  
55 at their outer ends with a crank, bars pivoted to the short levers at points between the ends thereof, and an oscillating fulcrum or support passing through the said bars, substantially as described.

4. In a device of the class described, the  
60 combination with a reciprocating cross-head, of a lazy-tongs system of levers comprising the short levers 12 and 14 pivoted at their outer ends to the cross-head the long levers  
65 16 and 17 pivoted together near their outer ends and having their inner terminals pivoted to the inner ends of the levers 12 and 14, the crossed bars 13 and 15 pivoted to the levers 12 and 14, at the centers thereof, and  
70 the toggle-links connected with the outer ends of the levers 16 and 17, and an oscillating or swinging fulcrum passing through the bars 13 and 15 and connecting the same at the centers thereof, substantially as described.

In testimony that I claim the foregoing as  
75 my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT GEORGE LINN.

Witnesses:

J. W. SARGENT,  
F. F. HOUSER.