S. LAKE.

EXTENSIBLE TOOL CARRYING ARM.

APPLICATION FILED OCT. 11, 1918.

1,335,512.

Patented Mar. 30, 1920.

2 SHEETS—SHEET 1.

Fig. 1

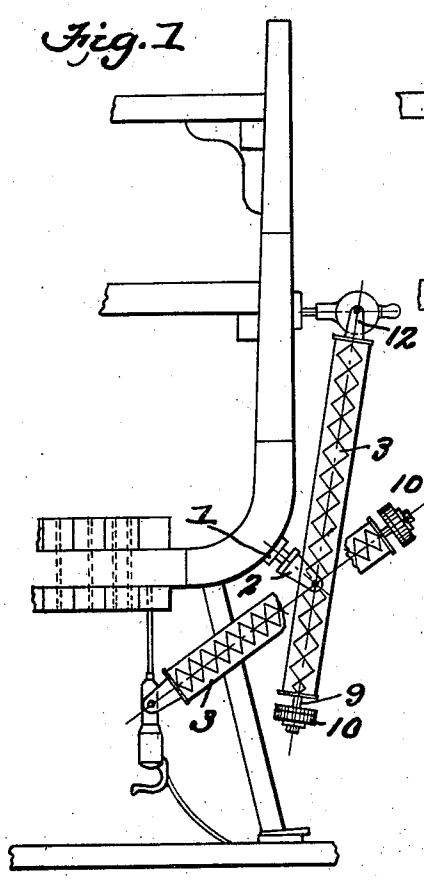


Fig. 2.

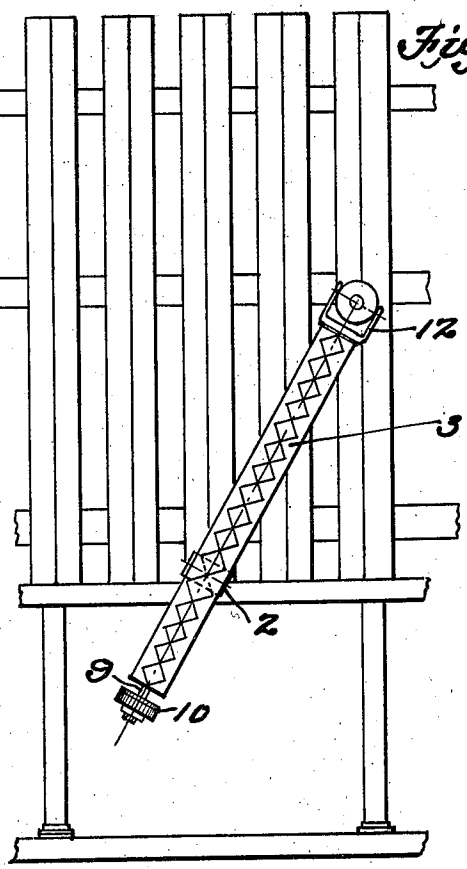


Fig. 6.

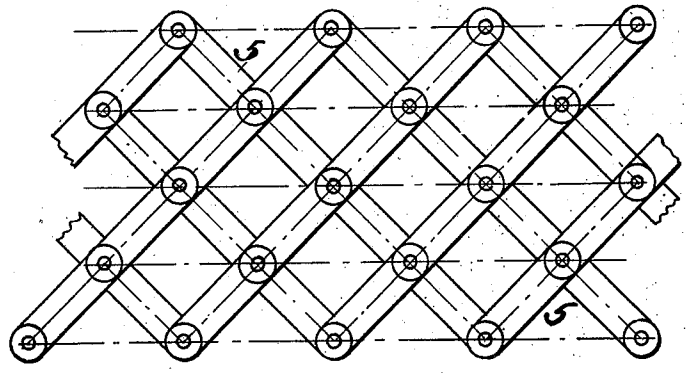
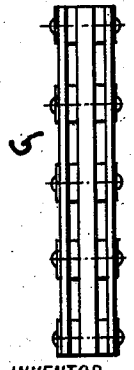


Fig. 7



INVENTOR

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BY

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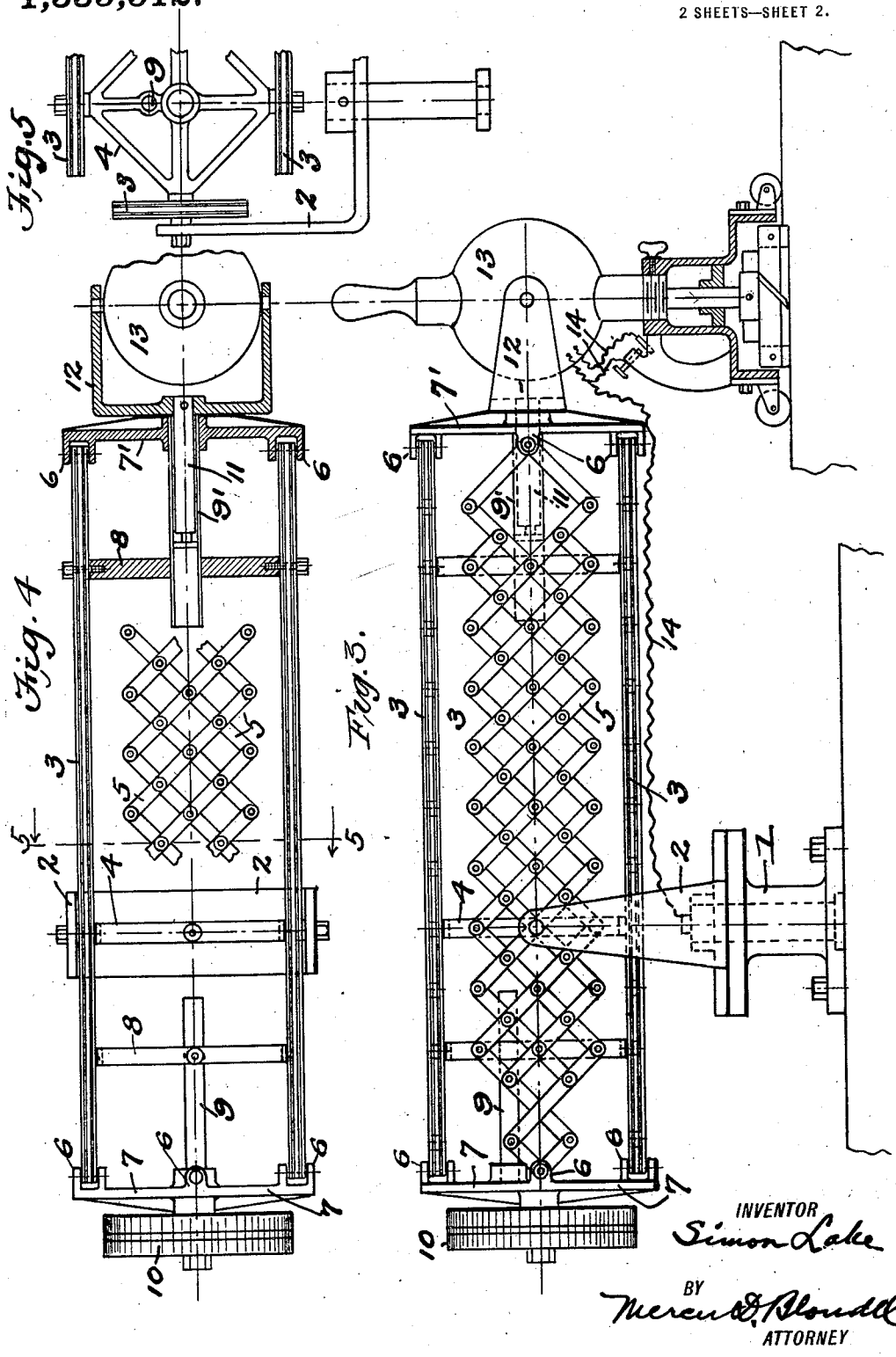
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EXTENSIBLE TOOL-CARRYING ARM.

1,335,512. Specification of Letters Patent. Patented Mar. 30, 1920.

Application filed October 11, 1918. Serial No. 257,819.

To all whom it may concern:

Be it known that I, SIMON LAKE, a citizen of the United States, residing in Milford, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Extensible Tool-Carrying Arms, of which the following is a specification.

The invention relates to an improved apparatus for handling machine tools of such weight as render their manipulation inconvenient by hand power, the construction being such that heavy portable tools may be readily and easily adjusted into position relative to the work.

The invention consists in the arrangement of an extensible arm adapted to carry a working tool at one end and having a counterbalancing weight whereby to permit easy adjustment of the tool to the work, and the object is to provide an apparatus to facilitate the manipulation of heavy tools such as are used in ship construction, and other industries requiring various adjustments of the tool in any direction according to the location of the work, hence avoiding the necessity of the employment of extra labor in order to permit the operator to execute the work in less time and with greater accuracy than has been possible with the methods of handling cumbersome tools heretofore employed.

In the drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a diagrammatic view illustrating the adaptation of my invention in use with ship building construction. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation of the adjustable arm showing a planing tool at its outer end. Fig. 4 is a sectional plan view, parts being broken away. Fig. 5 is a transverse section drawn on the line 5—5 of Fig. 4, parts being broken away. Figs. 6 and 7 are details of construction.

1 designates a base adapted to be mounted upon a suitable platform or upon the side of a ship as occasion may require. Upon the base 1 is swivelly mounted a yoke 2 in which is journaled an extensible arm 3 carried by a rectangular frame 4. The arm 3 is constructed of four sets of lazy tongs 5, each set of tongs having their inner and outer members pivotally connected in lugs 6 carried by frames 7 and 7′, respectively.

Pivoted to the journals of the lazy tongs adjacent to the inner and outer members or levers thereof, are frames 8 providing bearings for guides 9 and 9′ carried by the frames 7 and 7′, respectively, the said guides being arranged out of vertical alinement so that they will not be caused to interfere when the arm is retracted. As shown the guide 9 is carried in a bearing formed in the frame 7, and is adjustable longitudinally therein, and positioned upon its outer end is a weight 10 designed to act as a counterbalance for the tool carried by and at the outer end of the arm as will be presently described. The guide 9′ is in the nature of a tube and rotatively held in this tube is a shaft 11 upon the outer end of which is mounted a yoke 12 in which is mounted a motor 13 designed for operating a tool such as a planer, drill, riveting guns and the like. In the present illustration I show the arm provided with a planing tool and it will be understood that when a riveting tool is employed a motor suitable to such operation will be installed in place of the motor shown. It will be noted, however, that by mounting the shaft 11 in a tubular bearing that I provide a universal mounting for the motor which enables me to readily adjust the tool to meet the work. The conducting wires 14 connected to the motor are carried down through the base 1 so that the arm may be rotated without difficulty. It may be stated here, that the yoke 1 is swiveled on the base so as to permit of its being swung on its axis thus providing a large radius of action for the tool carried at the outer end of the arm.

The invention is specially designed for use in the building of ships and when a planer is used it is possible to use a motor of considerable weight and horse power thus making it possible to remove wood in large quantities when dressing or "dubbing" the frames, beams and planks of a ship. Heretofore such work has been done by hand labor with the use of an adz and hand planes and it is obvious that such methods are slow and costly, but with my apparatus I am able to perform such work in a much shorter time and at a greatly reduced cost.

In practice the motor and the tool carried thereby may be located substantially twice the distance from the pivotal point of the arm 3 with respect to the weight 10, so that a mean balance will be maintained irre-

spective of the position or the extension of the arm, provided, of course, that the weighted end of the arm is twice the weight of the motor and the tool carried thereby. This balance will always be maintained when the arm is either extended or contracted in a horizontal direction, since by my special connection of the end members of the lazy tongs and their relative lengths with respect to their pivotal centers, the weighted end of the arm will be caused to be moved just one half the distance at which the motor end is moved. If, however, the apparatus were mounted on a vertical wall, and rotated in a vertical plane, wherein the yoke 2 is used as the axis of rotation, then the heavier end would overbalance the lighter end and thus automatically extend the arm if the two ends of the lazy tongs terminate at the respective ends of the arm in the same manner. Therefore I purpose constructing the lazy tong bars or levers at the weighted end of the arm with a shorter leverage than those at the opposite end of the arm, so that, no matter to what extent the arm may be extended the heavier weight is counterbalanced by the lighter weight.

From the foregoing it will be seen that I provide an apparatus that will be found particularly useful in work wherein it is necessary to employ heavy portable tools and where it is necessary to constantly shift the position of the tool since motors of considerable horse power may be employed without inconvenience or exertion upon the part of the operator.

What I claim is:—

1. A rectangular shaped extensible arm formed of a plurality of lazy tongs, said arm having a working tool at one end and a counterbalance weight at its opposite end, and a support for said arm.

2. An extensible arm formed of a plurality of lazy tongs, a swivel support for said arm means connected to one end of the arm for supporting a working tool, and a counterbalance weight carried by and at the opposite end of the arm.

3. An extensible tool carrying arm composed of a plurality of lazy tongs, and having frames at each end, a swivel support for said arm, a tool holder carried at one end of the arm, and a counterbalance weight carried at the opposite end of the arm.

4. In a tool carrying arm, a support, an extensible arm swiveled in said support, frames carried at the ends of said arm, a working tool rotatably mounted in one of said frames, and a counterbalance weight carried by the frame at the opposite end of the arm.

5. An extensible tool carrying arm composed of a plurality of lazy tongs, frames to which the ends of tongs are connected, a tool carrying member connected to one of said frames and a counterbalance weight carried by the other of said frames.

6. An extensible tool carrying arm, comprising a plurality of lazy tongs, frames connected to end members of said tongs, an adjustable weight carried at one end of said arm, and a rotatable tool carrying member supported at the opposite end of the arm.

7. An extensible tool carrying arm, comprising a plurality of lazy tongs, frames connected to the end members of said tongs, an adjustable weight carried at one end of said arm, and a rotatable tool carrying member carried at the opposite end of said arm, a support to which said arm is pivoted, said pivotal point being so located as to counterbalance the arm irrespective of its position.

8. An extensible tool carrying arm, comprising a plurality of lazy tong members, frames to which the end members are connected, a rotatable tool carrying member carried by one of said frames, an adjustable counterbalance carried by the other of said frames, and a support for said arm, said support being so located that the arm is counterbalanced in all positions of its adjustment.

In testimony whereof, I have hereunto set my hand, this ninth day of October, A. D. 1918.

SIMON LAKE.

Witnesses:
MARY E. LYDDY,
M. D. BLONDEL.