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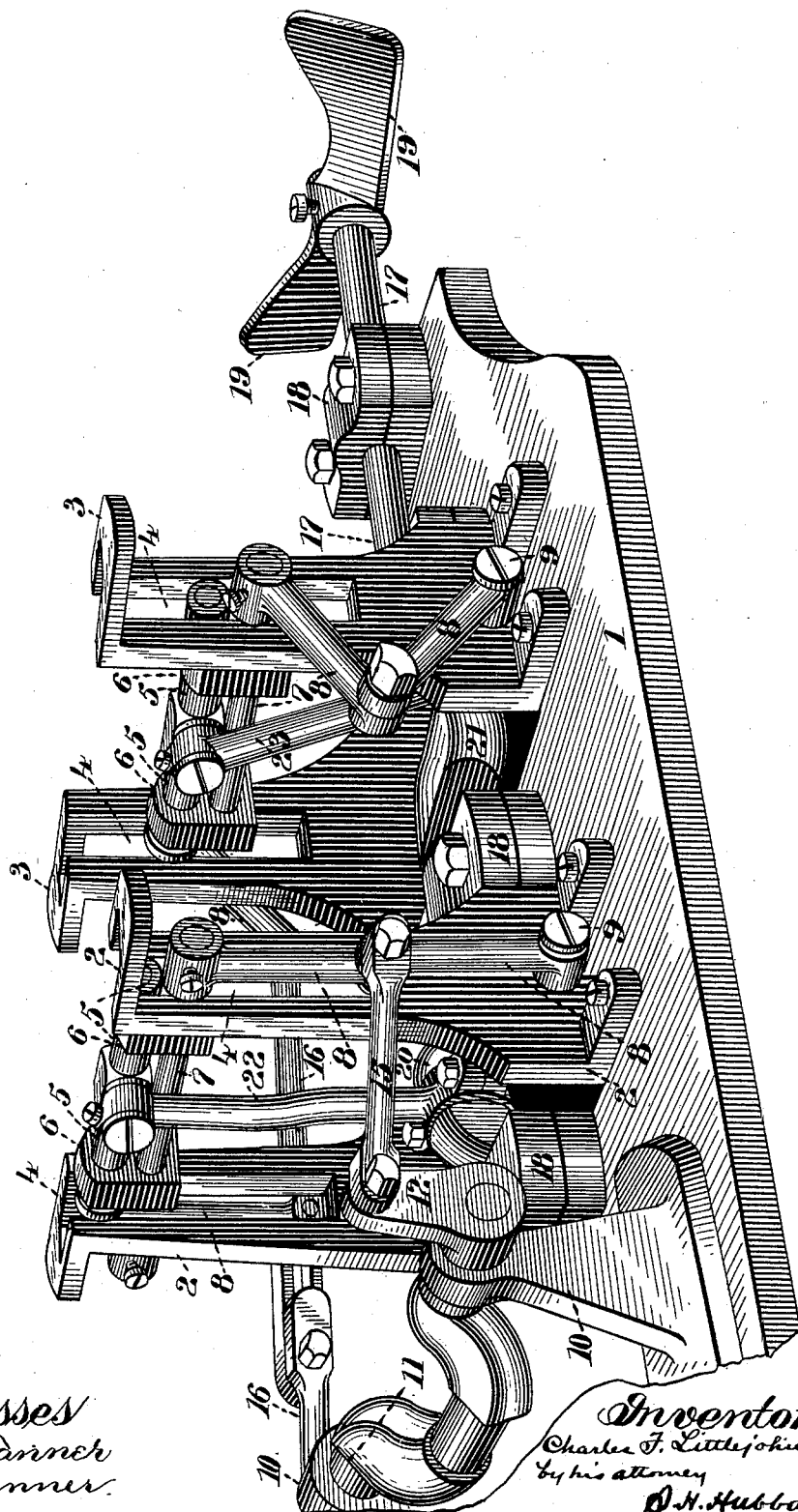
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C. F. LITTLEJOHN.
POWER TRANSMITTER.

No. 423,064.

Patented Mar. 11, 1890.

Fig. 1.



Witnesses
Wm. J. Panner
H. J. Panner.

Inventor
Charles F. Littlejohn
by his attorney
O. H. Hubbard.

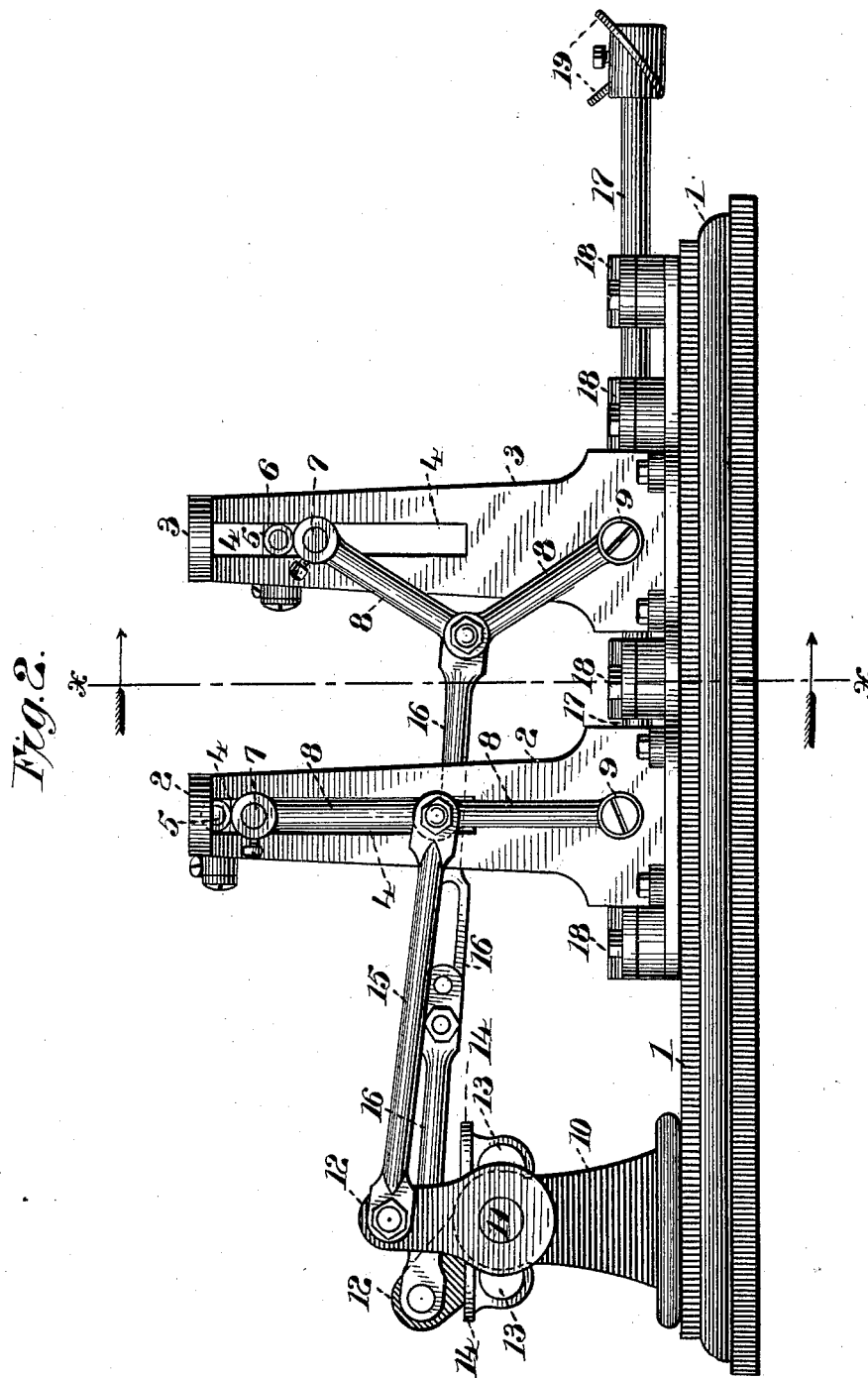
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Witnesses
Wm J Tanner
R. J. Tanner.

Inventor
Charles F. Littlejohn
by his attorney D. H. Hubbard.

(No Model.)

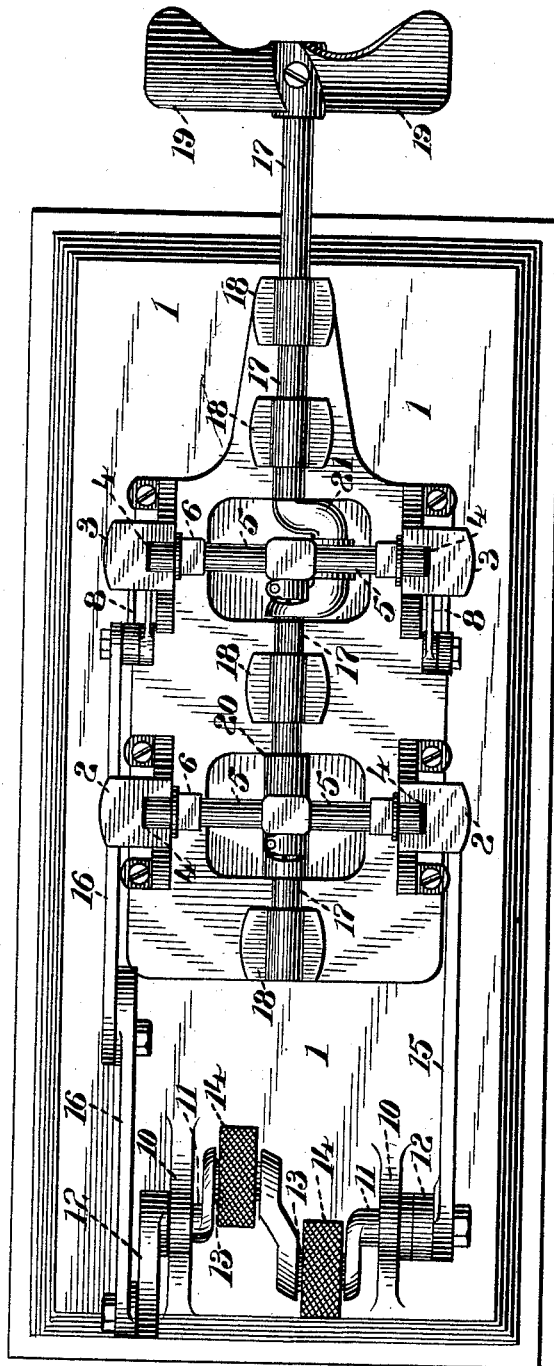
C. F. LITTLEJOHN.
POWER TRANSMITTER.

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No. 423,064.

Patented Mar. 11, 1890.

Fig. 3.



Witnesses
Wm. J. Tanner
A. J. Tanner.

Inventor
Charles F. Littlejohn
by his attorney
D. H. Hubbard

(No Model.)

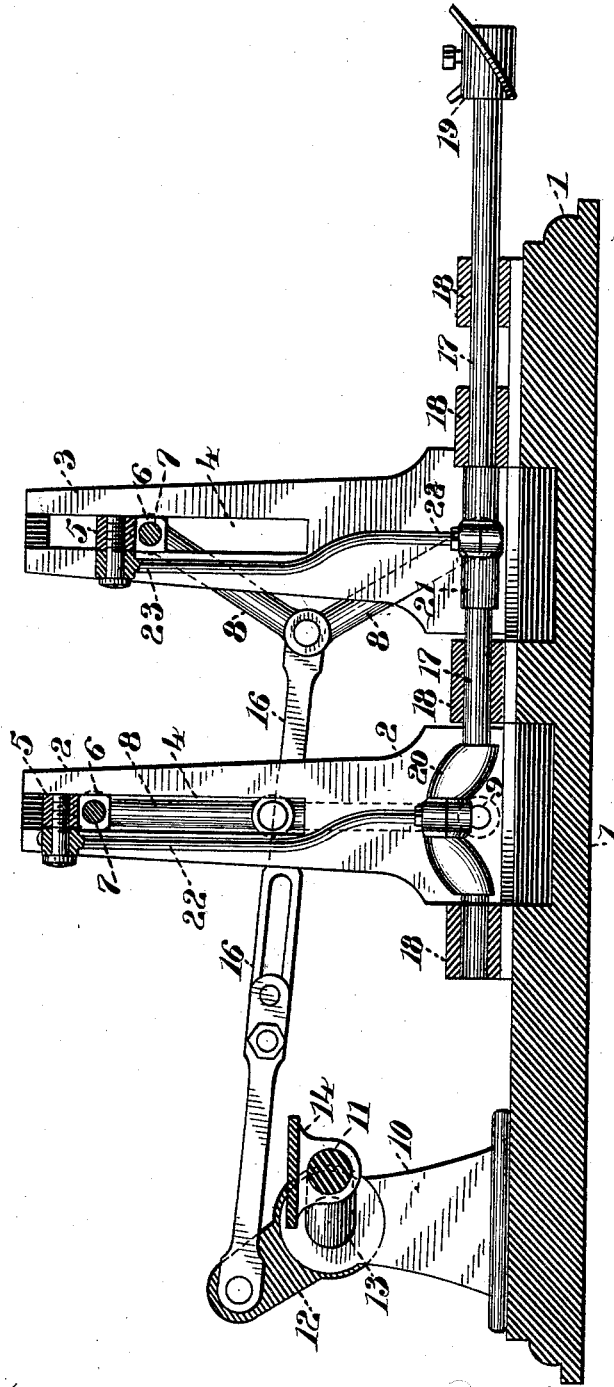
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Fig. 4.



Witnesses
E. J. Tanner
S. J. Tanner.

Inventor
Charles F. Littlejohn
by his attorney
D. H. Hubbard.

(No Model.)

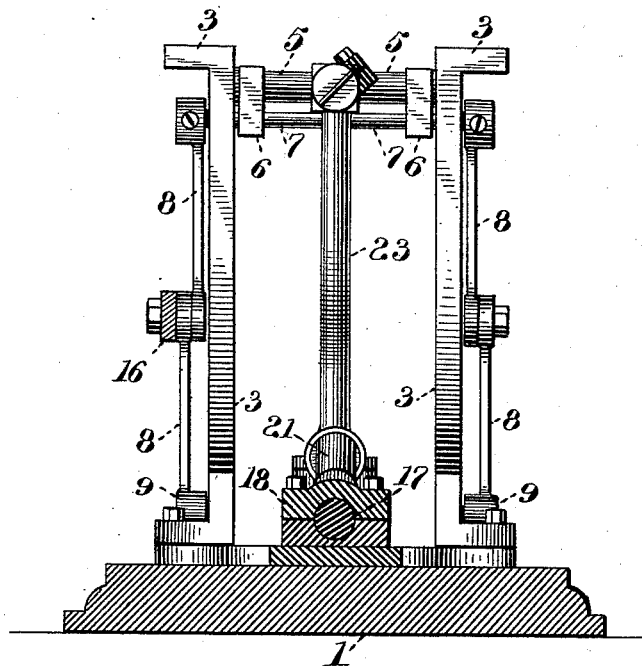
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Fig. 5.



Witnesses
Wm. J. Panner
St. J. Panner

Inventor
Charles F. Littlejohn,
by his attorney
D. H. Hubbard.

UNITED STATES PATENT OFFICE.

CHARLES F. LITTLEJOHN, OF BRIDGEPORT, CONNECTICUT.

POWER-TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 423,064, dated March 11, 1890.

Application filed October 3, 1889. Serial No. 325,821. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. LITTLEJOHN, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Power-Transmitters; and I do hereby 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.

My invention relates to certain novel and useful improvements in devices for the transmission of power, and has for its object to provide a device of this description which shall be suitable for the driving of boats or vehicles, or for interposition between any desired source of power, as a stationary engine, and machinery or shafting driven thereby; and with these ends in view my invention consists in the construction and combination of co-operating mechanical elements, hereinafter to be fully explained, and then recited in the claims.

In order that those skilled in the art to which my invention appertains may fully understand how to make and use the same, I will now describe it in detail, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective of my improved transmitter, the same being arranged to transmit the power of a cranked shaft to a propeller; Fig. 2, a side elevation; Fig. 3, a plan view; Fig. 4, a vertical longitudinal section; Fig. 5, a transverse section at line *xx* of Fig. 2.

Like numerals denote the same parts in all the figures.

1 is the bed, which, as will be readily understood, may be secured in the bottom of a boat or upon any fixed base.

2 3 are standards arranged in pairs projecting upwardly from the bed, each of said standards having a vertical guideway 4, in which a cross-head is mounted and adapted to slide. Each cross-head consists of a transverse shaft 5, having friction-rollers running in the guideways, a pair of blocks 6, through which the ends of the shaft project, and a shaft 7 beneath shaft 5, and which is journaled in and extends through the blocks and

outward through the guideways beyond the outer faces of the standards.

8 are toggle-levers, fulcrumed together and having their ends connected, respectively, to a fixed point on the standard, as 9, and to the outwardly-projecting ends of the shaft 7, so as to turn the latter in its bearings.

10 are standards mounted on the bed, and having journaled therein a driving-shaft 11, which carries cranks 12 on its outer ends, and which I have shown in Figs. 2 and 3 as provided with cranks 13, carrying pedals 15, as a means for applying foot-power thereto.

15 is a connecting-rod extended between one of the cranks on the shaft 11 and the fulcrum of the toggle-levers, which serve to actuate the cross-head on the standards 2, and 16 is a similar connecting-rod extended between the other driving-crank and the fulcrum of the toggle-levers on the standards 3.

17 is the driven shaft, arranged longitudinally of the bed in bearings 18 and shown in the drawings as carrying a propeller 19. Beneath each of the cross-heads, heretofore referred to, this shaft carries cranks 20 21, and pitmen 22 23 are strapped around the cranks and are pivotally secured, respectively, at their upper ends to projections of the shafts 5. The cranks on the propeller-shaft are relatively eccentric, and the connecting-rods between the driving-crank and the fulcrum-points of the toggle-levers are so arranged that when one set of said levers is on its dead-point the other is in position to exert its greatest force. (See Fig. 1.)

In the operation of my invention the rotation of the driving-crank imparts a longitudinal reciprocatory motion to the connecting-rods, which in their turn alternately double and straighten the toggle-levers to which they are connected. The doubling and straightening of the toggle-levers by the connecting-rods turns the shaft 7, to which they are secured, and this operates the toggle-levers at the other side of the standards to a degree corresponding to the degree of movement of the levers directly operated by the connecting-rods. The mediately-operated toggle-levers are for the purpose of steadying the cross-head, so as to insure to it an equal movement at either end, so that any tendency

to cramp in the guideways is avoided. The rising and lowering of the cross-heads imparts to the cranked propeller-shaft through the pitmen a rotary movement double in speed that of the cranked driving-shaft.

By the use of my invention not only is a doubly-speeded rotation of the driven shaft effected, but as the toggle-levers are so timed as to apply their power most advantageously to said shaft—that is, the greatest power of the levers is exerted when the driven crank is at right angles—the power applied to the driving-shaft is most advantageously communicated to the driven shaft.

As heretofore stated, I do not desire to confine myself to the use of my improvement for the purpose shown in the drawings, and I do not wish to be limited to the details of construction and combination of elements hereinafter shown and described, since many minor changes entirely within the province of mechanical skill may be made therein without departing from the spirit and aim of my invention. For instance, such obvious alterations as the placing of the toggle-levers inside instead of outside the standards, or the use of levers of a different form from those shown, I should consider to be a mere colorable or substitution of equivalents.

I claim—

1. In a power-transmitter, the combination, with a suitable base, of the standards and the cross-heads arranged to slide therein, the toggle-jointed levers connected to said cross-heads, the crank-driven shaft, and the pitmen interposed between said shaft and the cross-heads, and means connected to the elbows of the toggle-jointed levers, whereby the latter are operated in proper time for the actuation of the cross-heads, substantially as specified.

2. In a machine of the character described, the combination, with the crank-driven shaft, of the standards, the cross-heads, and the pitmen, the toggle-jointed levers interposed between the cross-heads and a fixed base, and means connected to the joints of said toggle-levers, whereby both sets of the latter are caused to move in proper time, as specified.

3. In a device of the character described, the combination, with the bed, of the crank-driven shaft journaled longitudinally thereof, the standards mounted on the bed over the

driven shaft, cross-heads arranged and adapted to slide in said standards, toggle-levers connected to and adapted to operate the cross-heads, and connecting-rods operated from any convenient source of power and connected to the fulcrum-points of the levers, substantially as specified.

4. In a power-transmitter, the combination, with the bed, of the standards mounted thereon and provided with guideways, the cross-heads mounted in the guideways, the toggle-jointed levers connected to said cross-heads at either side the standards, the connecting-rods secured to the elbows of the toggle-jointed levers, the crank-driven shaft, and the pitmen connected thereto at their lower ends and pivoted above to the cross-heads, substantially as set forth.

5. In a device of the character described, the combination, with the bed, of the standards having guideways therein, the shafts whose ends have a bearing in the guideways, the pitmen pivoted to said shafts, and the crank-driven shaft operated by said pitmen, the transverse rock-shafts beneath the shafts carrying the pitmen, the toggle-jointed levers connected to said rock-shafts at one end and at the other end to fixed pivotal points on the base, and the connecting-rods whereby the elbow movement is imparted to said toggle-jointed levers, substantially as set forth.

6. In a machine, as described, the combination, with the standards and the toggle-jointed levers, of the shaft 7, to which the levers are attached, the shaft 5, guided as to its ends, and the pitman pivotally connected to the shaft 5, substantially as set forth.

7. In a power-transmitter, the combination, with the standards, the crank-driven shaft, the toggle-levers, and means for operating the latter in proper time, of the cross-head consisting of a rock-shaft connected to the toggle-levers, a guided shaft and bearing-blocks, and the pitmen connected to the cross-head and to the crank of the driven shaft, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. LITTLEJOHN.

Witnesses:

S. H. HUBBARD,

M. C. HINCHCLIFFE.