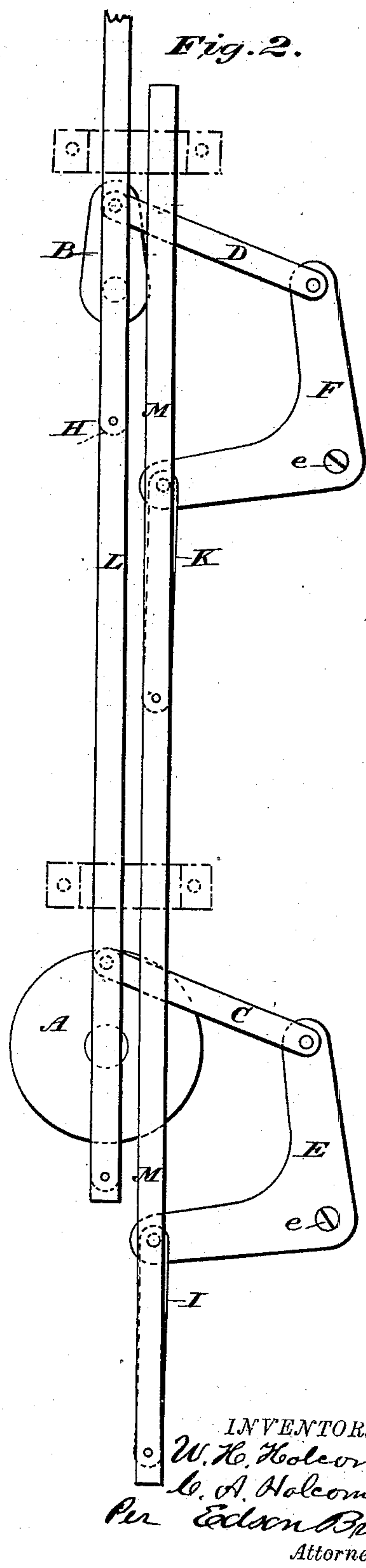
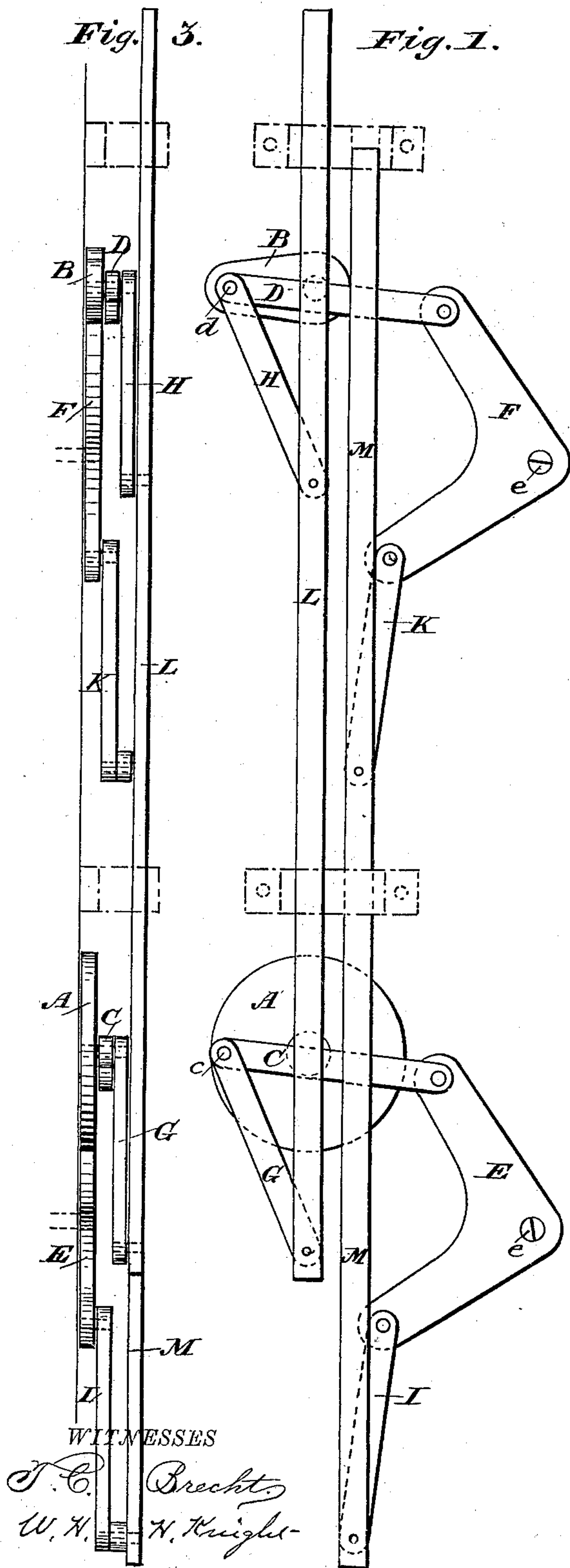


(No Model.)

W. H. & C. A. HOLCOMB.
MECHANICAL MOVEMENT.

No. 257,328.

Patented May 2, 1882.



UNITED STATES PATENT OFFICE.

WILLIAM H. HOLCOMB AND CLIFFORD A. HOLCOMB, OF BELOIT, WIS.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 257,328, dated May 2, 1882.

Application filed November 3, 1881. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. HOLCOMB and CLIFFORD A. HOLCOMB, citizens of the United States; residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Mechanical Movements; and we 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in mechanical movements; and the object is to produce a movement by which reciprocating motion is converted into rotary motion in such manner that the dead-centers will be effectually overcome.

The invention consists of two rods arranged side by side, and connected by suitable links to two cranks and two angle or bell-crank levers in such manner that while one rod, with its links, crank, and bell-crank lever, is pulling in one direction the other one is pushing in the opposite direction, and is thus assisting it (the other one) over its center, and vice versa, all of which will be more fully described hereinafter, reference being had to the accompanying drawings and the letters of reference marked thereon.

In the accompanying drawings, Figure 1 is a side view of our mechanical movement with the cranks at one-fourth revolution. Fig. 2 is a similar view with the cranks at one-half stroke. Fig. 3 is an edge view of Fig. 1.

In the drawings, A B represent two cranks placed at suitable distances apart, according to the machinery to be driven, or from which the motion is received. To the cranks A B are pivoted the links C D by pins *c d* at one end, while at the other end they are attached to one end of the angle or bell-crank levers E F, which are pivoted to a suitable bracket or other desired place by pins *e*. Two additional links, G H, are pivoted at one end to the above-mentioned pins *c d*, while their other ends extend downward and are attached to the vertical or horizontal rod L. A third set

of links or pitmen, I K, are connected at one end by suitable pins to the opposite ends of the bell-crank levers E F from which the links C D are attached, while the other ends of said links I K are pivoted to the rod M.

As a modification, if desired, instead of the rods L M, tubes may be substituted, one sliding within the other. In this instance slots must be provided, through which the pins move which connect the inner tube with one end of the bell-crank levers E F, while collars are secured to the outer tube, to which collars the pins are secured upon which the links are pivoted that connect with the crank-pins of cranks A B. This arrangement is more especially adapted to be connected to windmills and similar machinery.

The first-described arrangement is also adapted for windmills, although more especially intended for locomotives, steam-engines, pumps, and similar machinery.

The operation is as follows: When the cranks A B are at the outer quarter-stroke, as shown in Fig. 1, the links G H will draw upon the crank-pins *c d*, rod L, and links C D, thus pulling the bell-crank levers at their upper ends toward the center of the cranks. At the same time the links I K will push the rods M and lower ends of the bell-crank levers in the opposite direction from which the rod L is moving, and this operation will continue until the entire stroke of the crank is completed.

It will be thus seen that it is perfectly impossible to have any dead-centers in this mechanical movement, as when the one set of links is pulling upon the pins of the two cranks the other set of links is pushing against them. Thus, vice versa, each set, with its attachments, is always assisting the other, and thus making a dead-center an impossibility.

We attach importance to the relative position of the connecting-links or pitmen to their respective cranks. The links or pitmen receiving power from the driving-crank must be placed in the same position to the cranks as the links or pitmen are to the crank receiving power. In this position they compensate, and are enabled to pass the dead-centers without the aid of sliding wrist-pins or slotted boxes.

Having thus described our invention, we

claim and desire to secure by Letters Patent—

1. The combination of the cranks, connecting-links, bell-crank levers, and rods or tubes, arranged substantially as shown, to form a
5 mechanical movement, as and for the purpose described.

2. In a mechanical movement, the combination of cranks A B, with the bell-crank levers E F, rods or tubes L M, and connecting-links,
10 substantially as shown, and for the purpose specified.

3. The combination of the cranks A B, links G H, connected to rod L, and links C D, attached to one end of the bell-crank levers E F,
15 with the links I K, connected to the rod M, all

constructed and arranged for operation substantially as shown, and for the purpose described.

4. In a mechanical movement, the pitmen I K, connected to the bell-cranks E F, links C 20 D, cranks A B, and rods or tubes L M, arranged substantially as and for the purpose specified.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. HOLCOMB.
CLIFFORD A. HOLCOMB.

Witnesses:

R. TATTERSHALL,
B. A. CHAPMAN.