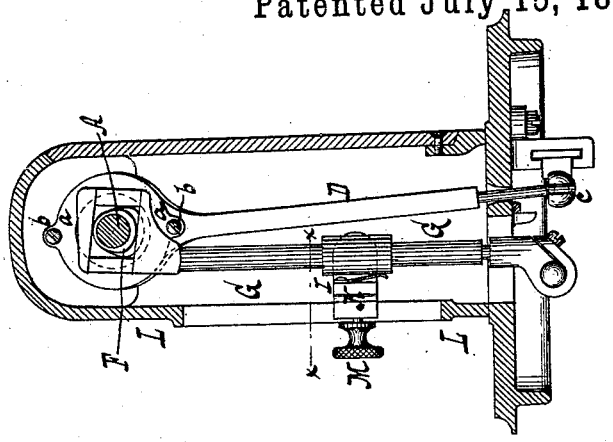
(No Model.) 2 Sheets—Sheet 1.

I. M. AVERY.

MECHANICAL MOVEMENT.

No. 302,186. Patented July 15, 1884.

Fig. 2.



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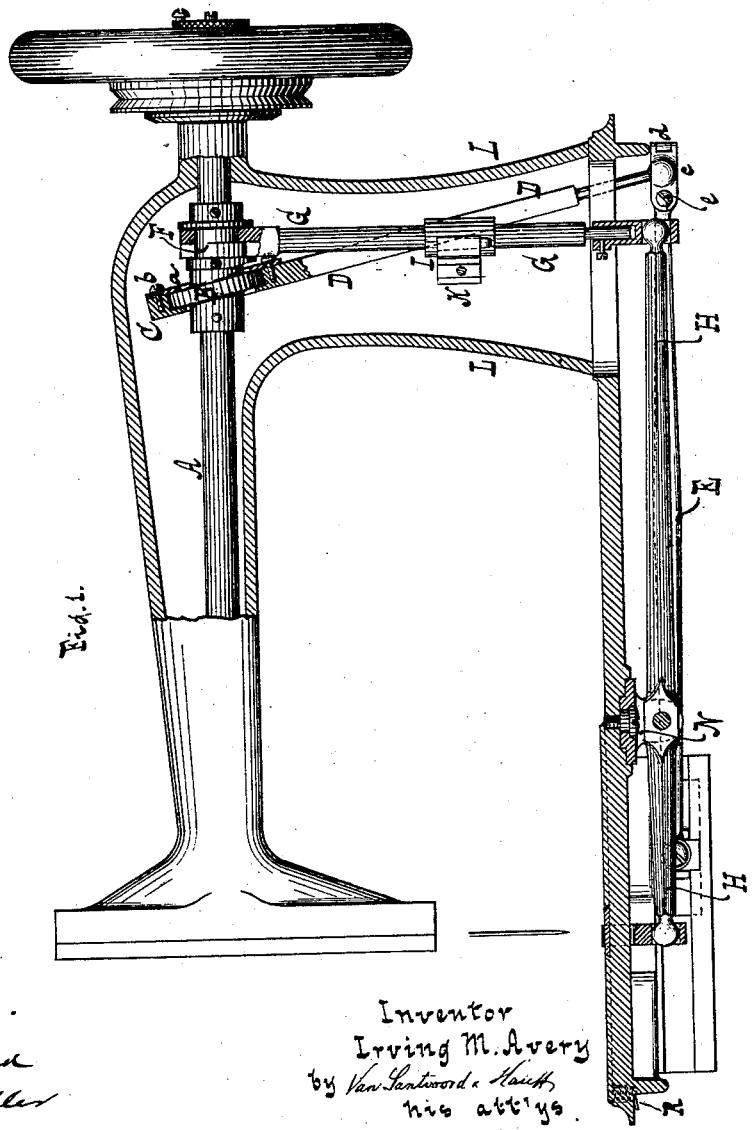

Witnesses
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William Miller

Inventor
Irving M. Avery
by Van Santvoord & Hauff
his att'ys

(No Model.) 2 Sheets—Sheet 2.

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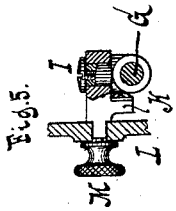

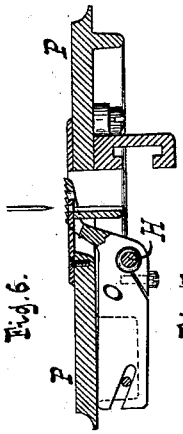

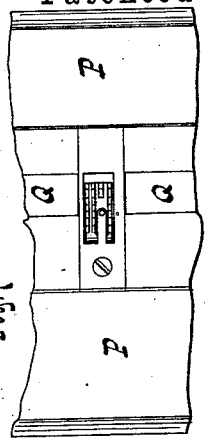

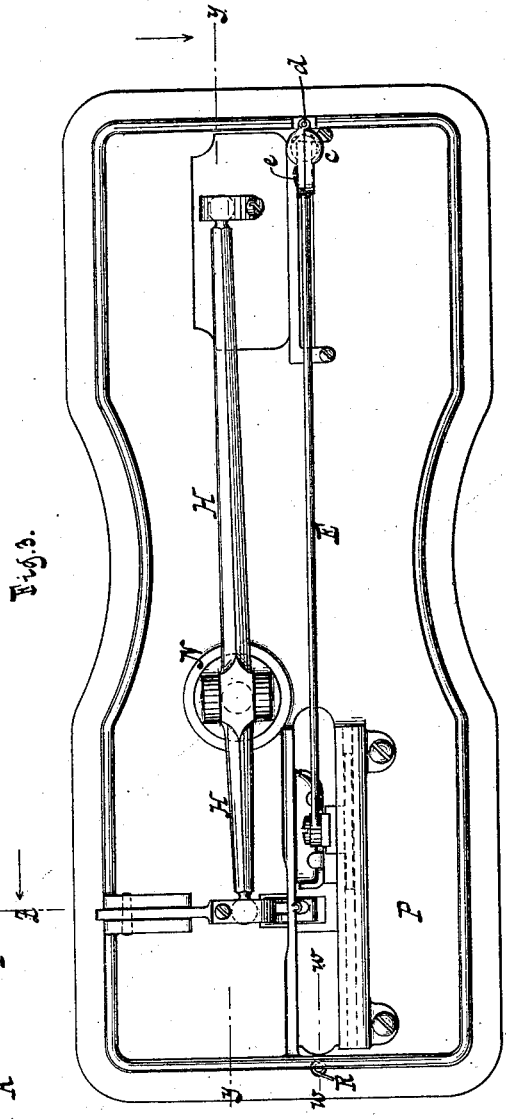

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UNITED STATES PATENT OFFICE.

IRVING M. AVERY, OF BROOKLYN, NEW YORK.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 302,186, dated July 15, 1884.

Application filed May 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, IRVING M. AVERY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention consists in the combination, with an oblique disk mounted on an actuating arm or shaft, of a lever or arm which connects by means of a hinge or joint with a slide or pitman, so that when the actuating-shaft is turned or operated a reciprocating motion is imparted to the slide or pitman. On the actuating-shaft may also be mounted a cam for further utilizing the actuations of the shaft.

In the accompanying drawings, Figure 1 is a side elevation, partly in section in the plane *y y*, Fig. 3. Fig. 2 is an end view, partly in section. Fig. 3 is an inverted plan view. Fig. 4 shows means for holding removable plates in place, being a section in the plane *w w*, Fig. 3.

The remaining figures show details, hereinafter referred to.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a shaft which is mounted in suitable bearings, so that a revolving or rocking motion can be imparted to it. On this shaft is firmly secured a circular disk, B, which is placed in an oblique position toward the shaft. On this disk is placed a strap, C, from which extends a lever, D, and this lever connects by a ball-and-socket joint, *c*, with a slide or pitman, E. The strap C is made to overlap the edges of the disk B, and it is held in position by a ring-plate, *a*, which is fastened to it by screw *b*. Instead of this, however, the disk B might be provided with a groove in its periphery, to receive the strap in the same manner as straps are usually connected to eccentrics; or any other desired means may be employed for connecting the lever D and the disk B—for example, the disk B may be made in two parts, between which the lever D may be placed. When the shaft A is revolved, an oscillating motion is imparted to the lever D by the oblique disk B, the position of which in relation to the shaft changes. By the action of the lever D a reciprocating motion is imparted to the slide or pitman E. The end of the pitman E, which is connected by the ball-joint *c* to the lever D, is free to follow the motion of that end of the lever D, with which said pitman E is connected, so as to prevent any crowding. Of course it will be readily seen that a hinge-joint—for example, of the construction of a door-hinge—will accomplish the same purpose as the ball-and-socket joint *c;* but I prefer a ball-and-socket joint, as being easy of construction, and also allowing more freedom of motion, and avoiding any liability to break in case any lateral jar or motion should occur. On the shaft A is also mounted a cam, F, which cam, on the revolution of the shaft, imparts motion to a cam-lever, G. This cam-lever G is adapted to oscillate or turn about a fulcrum, I, which fulcrum is formed on a fulcrum-block, K. (Shown in detail in Fig. 5, which represents a section in the plane *x x*, Fig. 2.) This fulcrum-block K is adapted to be set in a higher or lower position in a slot in the standard or support L, and to be held at any desired position by a clamping-screw, M. By adjusting the fulcrum I nearer to or farther from the cam F, the throw or motion of that end of the lever G which is not connected to the cam F will become greater or less, as desired, and a regulation of motion is thus obtained. The end of the cam-lever G which is not connected to the cam F communicates by a ball-joint or other suitable joint with the connecting link or lever H, and imparts motion to it. The connecting link or lever H is hinged or pivoted to a universal joint, N, forming the fulcrum for said connecting lever or link H, so that the ends of said lever or link H are free to move laterally, as well as up and down. Thus any movement which is imparted to the connecting-link H by the cam-lever G will be readily partaken of by said connecting-link H.

As an example of the applicability of the mechanical movement above set forth, I have shown the same applied to a sewing-machine, where the slide or pitman E may serve to operate the shuttle-carrier, while the connecting-link H may serve to operate the feed-dog O, Fig. 6. Fig. 6 is a section in the plane *z z*, Fig. 3.

Of course I do not confine myself to the no

of my invention in a sewing-machine, as the same may be applied for any other purpose for which it is serviceable.

I am aware that the United States Patent No. 171,572, of December 28, 1875, shows a mechanical movement having a shaft, an oblique disk, a lever, a slide, and a swivel-pin in which the lever slides, and such I do not claim; but it should be noticed that I dispense with a swivel-pin and employ a ball-joint or hinge-joint to connect the lever D and pitman E. By this arrangement I dispense with the guides in which moves the slide in the construction of said Patent No. 171,572, thus cheapening the construction of the device and diminishing the friction and wear.

I am also aware that United States Letters Patent No. 67,752, of August 13, 1867, show a lever having an adjustable fulcrum and joined to a connecting-link; but said Patent No. 67,752 does not show said devices in combination with the oblique disk and its contiguous mechanism. By the combination of these elements I am enabled to obtain complicated movements without the employment of any springs or additional mechanism, and the movements are all continuous, avoiding any jars or blows and consequent noise and subjecting the parts to very little wear.

I would also call attention to the construction of the ball-and-socket joint *c*, connecting the lever D and pitman E. The ball or sphere is formed at the end of lever D, and is received in a cup or hollow in the pitman E, and which cup or hollow is formed by the co-operation of two parts, each containing part of such cup or hollow. These two parts are joined at one end by a hinge-joint, *d*, and at the other by a screw, *e*, and as the ball and socket wear out the wear can be compensated for by tightening the screw *e*.

To conveniently gain access to the mechanism, I may provide the base-plate P with openings covered by sliding plates Q, held from accidental displacement by a retaining-spring, R; but I make no claim to such features.

I make no claim to the particular link shown which connects the lower end of the lever G with the lever H, as such is not my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the shaft A, oblique disk B, oscillating lever D, pitman E, and a ball-and-socket joint, *c*, connecting the lever and pitman, to permit the end of the latter to easily follow the motion of that end of the lever with which said pitman is connected, substantially as described.

2. The combination, with the oblique disk B and cam F, mounted on a common arm or shaft, A, of a lever or pendent arm, D, and cam-lever G, substantially as set forth.

3. The combination, with the oblique disk B and cam F, mounted on a common arm or shaft, A, of a lever or pendent arm, D, and cam-lever G, provided with an adjustable fulcrum, I, substantially as set forth.

4. The combination, with the oblique disk B and cam F, mounted on a common arm or shaft, A, of a lever or pendent arm, D, slide or pitman E, cam-lever G, and connecting-link H, substantially as set forth.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

IRVING M. AVERY. [L. S.]

Witnesses:
W. C. HAUFF,
W. HAUFF.