(No Model.)

3 Sheets—Sheet 1.

C. WHITAKER.

FLY FRAME.

No. 535,038. Patented Mar. 5, 1895.

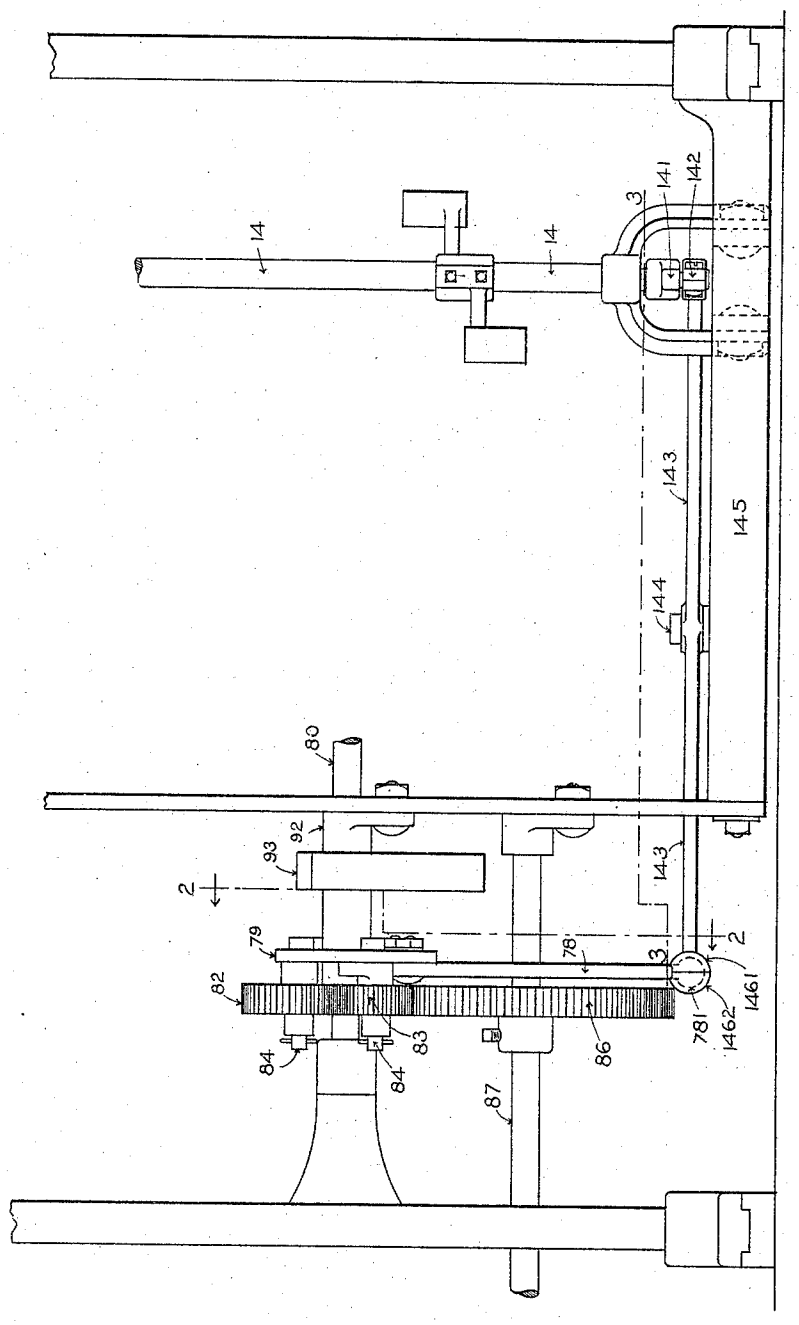

FIG. 1.

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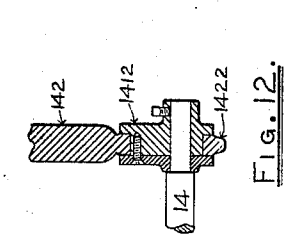

Fig. 12.

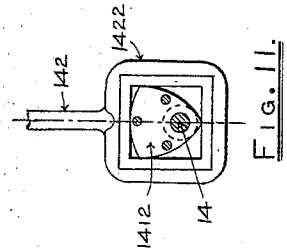

Fig. 11.

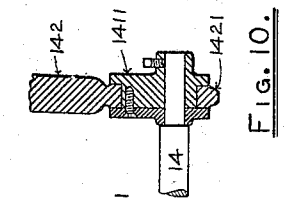

Fig. 10.

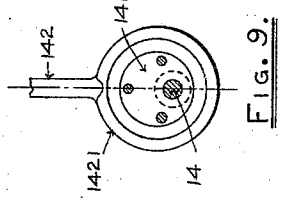

Fig. 9.

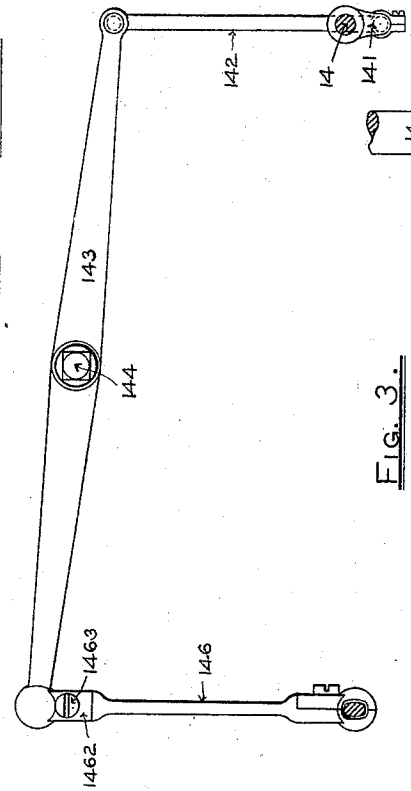

Fig. 3.

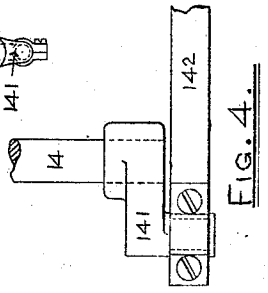

Fig. 4.

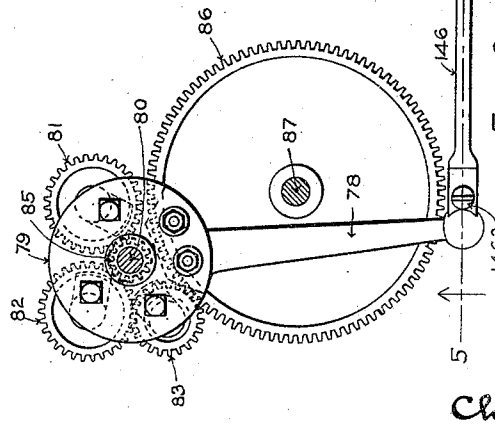

Fig. 2.

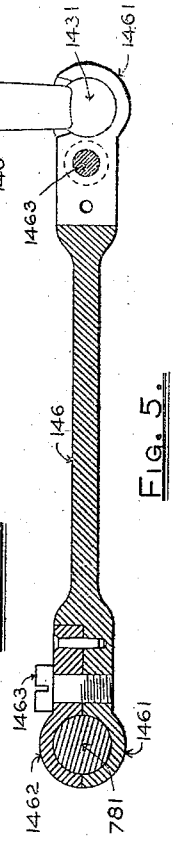

Fig. 5.

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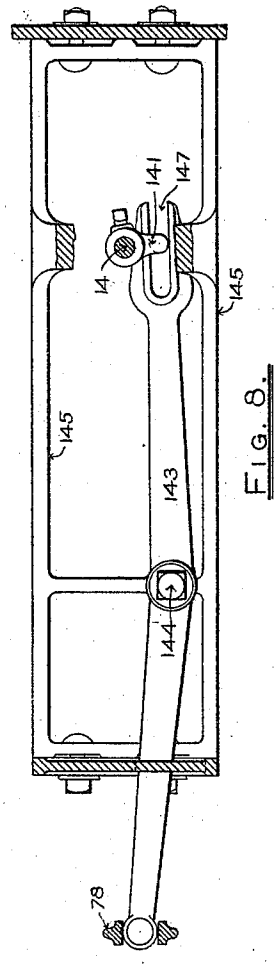

FIG. 8.

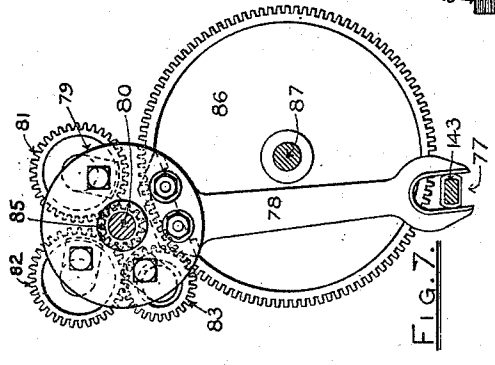

FIG. 7.

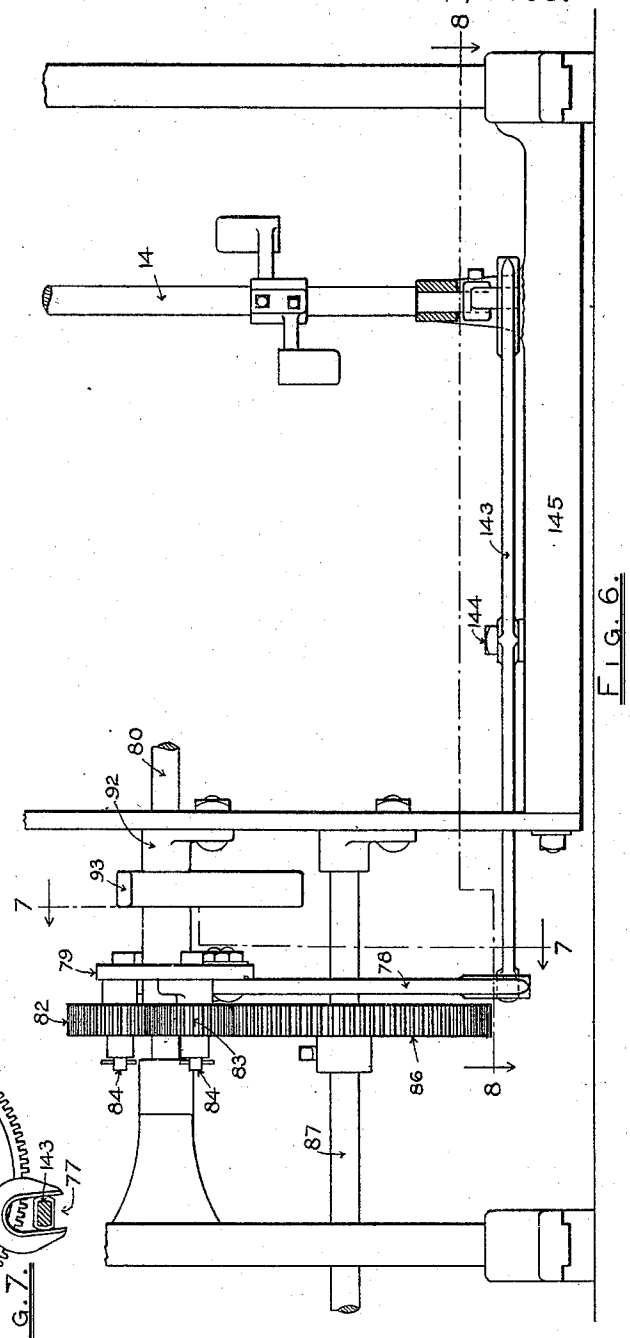

FIG. 6.

WITNESSES.

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UNITED STATES PATENT OFFICE.

CHANNING WHITAKER, OF TYNGSBOROUGH, ASSIGNOR TO THE LOWELL MACHINE SHOP, OF LOWELL, MASSACHUSETTS.

FLY-FRAME.

SPECIFICATION forming part of Letters Patent No. 535,038, dated March 5, 1895.

Application filed October 10, 1893. Serial No. 487,771. (No model.)

To all whom it may concern:

Be it known that I, CHANNING WHITAKER, a citizen of the United States, residing at Tyngsborough, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Fly-Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to the mechanism which is employed in fly-frames for moving the lifting-rail or traverse-rail up and down, and, more particularly, to the devices which are employed in fly-frames for communicating movement of rotation, first in one direction and then in the other, to the shaft, known as the lifting-shaft, which serves more immediately for the actuation of the lifting-rail or traverse-rail.

The invention is designed as an improvement upon a certain portion of the invention which is presented in the United States patent to W. P. Canning, No. 485,171, dated November 1, 1892, and it consists in an improved combination and arrangement of parts which I first will proceed to describe with reference to the accompanying drawings, and then will point out particularly and clearly define the same in the claims at the close of this specification.

In the drawings, Figure 1 is a view in rear elevation of part of a fly-frame having one form of my invention applied thereto, sufficient of the fly-frame being shown to disclose clearly the manner of applying and using my invention. Fig. 2 is a view in vertical section on the line 2—2 of Fig. 1 looking in the direction of the arrows in the latter figure. Fig. 3 is a view in horizontal section on the line 3—3 in Fig. 1. Fig. 4 is a view showing in elevation certain details. Fig. 5 is a view in horizontal section on the line 5—5 in Fig. 2, looking in the direction of the arrows in the latter figure. Fig. 6 is a view corresponding in character with Fig. 1, but showing a modified form of my invention. Fig. 7 is a view in vertical section on line 7—7 in Fig. 6, looking in the direction of the arrows in the latter figure. Fig. 8 is a view in horizontal section on the line 8—8 in Fig. 6, looking in the direction of the arrows in the latter figure. Figs. 9, 10, 11, and 12 are detail views showing modifications which are described hereinafter.

In the mechanism illustrated in the drawings, motion is taken from the lay-countershaft, 80, which is actuated in the manner set forth in the United States patent hereinbefore mentioned, it having constant movement of rotation in one direction.

At 85 is a pinion fixed upon the lay-countershaft, 80, and at 81, 82, are pinions both meshing with pinion 85, but not with each other.

At 83 is a pinion meshing with pinion 82, but not with either of the others.

The pinions 81, 82, and 83 are supported on studs, 84, 84, 84, fixed to the tumbler-head, 79, which is mounted upon the lay-countershaft, 80, so as to turn freely thereon.

At 86 is the reversing gear-wheel, it being mounted upon the lay-shaft, 87, from which latter motion is communicated to the lifting-shaft (not shown) and lifting-rail or traverse-rail (not shown) by means such as is shown and described in the patent hereinbefore mentioned.

The tumbler-head, 79, is capable of being rocked or swung upon the lay-countershaft, 80, so as to place either of the pinions 81 or 83 in mesh with the reversing gear-wheel, 86, but not both at the same time. As will be understood, by thus rocking or swinging the tumbler-head first in one direction and then in the other, movement of rotation in opposite directions, alternately, will be communicated from the pinion, 85, on the lay-countershaft, 80, through the transmitting pinions, 81, 82, and 83, to the reversing-gear-wheel, and thence to the lifting-shaft through the means aforesaid.

At 78 is the tumbler-arm by means of which the tumbler-head is connected with the devices for rocking the same, it being attached to the tumbler-head, and practically forming a part thereof.

At 14 is the tumbling-shaft.

All of the foregoing parts are or may be constructed and operated as in the patent aforesaid, save in the respects which will be apparent from the following:

Instead of operating the tumbler-head from

the tumbling-shaft, 14, through the reverse shaft and gearing whereby the said reverse shaft is rotated from the tumbling-shaft, which are shown and described in the said patent, I apply directly to the lower end of the tumbling-shaft, 14, a crank, 141, or its equivalent substantially such as is hereinafter indicated, and interpose between the said crank, or its equivalent, and the tumbler-head, a lever or walking-beam, 143, having one arm thereof in operative connection with the said crank, or its equivalent, and another arm thereof in operative connection with the said tumbler-head.

In Figs. 1 to 5 I have shown the connection of the opposite arms of the lever or walking-beam, 143, with the crank, 141, on the one hand, and the tumbler-head, 79, on the other, established by means of links or connecting-rods, 142, 146.

In Figs. 6 to 8, I have shown the pin of the crank, 141, fitted to a slot, 147, in one arm of the lever, 143, and the rounded end of the other arm of the said lever fitted to a slot, 77, in the tumbler-arm, 78.

When the links or connecting-rods shown in Figs. 1 to 5 are used, I prefer to provide universal joints, or ball and socket connections, at the opposite ends of the link or connecting-rod, 146, because of the fact that the lever or walking-beam, 143, with which one end of said link or connecting-rod is joined, swings in a horizontal plane, whereas the tumbler-arm, 78, with which the other end thereof is joined, swings in a vertical plane.

The preferred construction, which embodies ball and socket connections, is represented most clearly in Figs. 2, 3, and 5, in which it will be seen that the sockets, which are shown applied to opposite ends of the link or connecting-rod, 146, are made in separable portions, one of the latter, namely that marked 1461, being integral with the main portion of the link or connecting-rod, while the other, namely that marked 1462, is made separate and removable, in order to facilitate the application of the rounded or ball-portions, 1431, and 781, of the lever, 143, and tumbler-arm, 78, respectively, to the said sockets, the said removable portions being secured in place by the screws, 1463, 1463.

Figs. 9 and 10 are, respectively, a plan view and a view in vertical section of a slight modification. They illustrate the employment of an eccentric, 1411, as an equivalent of the crank, 141, the said eccentric being mounted on the lower end of the tumbling-shaft, 14, in lieu of the said crank, and having fitted to it a strap, 1421, formed or connected with the link or connecting-rod, 142.

Figs. 11 and 12 are, respectively, a plan view and a view in vertical section, illustrating the employment of a cam, 1412, in lieu of the said crank, 14, the said cam being fitted in a yoke, 1422, formed or connected with the link or connecting-rod, 142. As will be apparent, a similar eccentric or cam may be employed in lieu of the crank in the construction which is shown in Figs. 6, 7, and 8.

I claim as my invention—

1. The combination with the shaft 80, its pinion 85, the transmitting pinions 81, 82, and 83, the tumbler-head on which said transmitting pinions are mounted, the reversing gear-wheel 86, and the tumbling-shaft 14, of means for operating said tumbler-head from the tumbling-shaft consisting of a crank applied to the said tumbling-shaft, and a lever or walking-beam having one arm thereof operatively connected with the said crank and another arm thereof operatively connected with the tumbler-head, substantially as described.

2. The combination with the shaft 80, its pinion 85, the transmitting pinions 81, 82, and 83, the tumbler-head on which said transmitting pinions are mounted, the reversing gear-wheel 86, and the tumbling-shaft 14, of means for operating said tumbler-head from the tumbling-shaft consisting of a crank applied to the said tumbling-shaft, a lever or walking-beam, and links or connecting-rods joining the opposite arms of the said lever or walking-beam with the said crank and tumbler-head, respectively, substantially as described.

3. The combination with the shaft 80, its pinion 85, the transmitting pinions 81, 82, and 83, the tumbler-head on which said transmitting pinions are mounted, the reversing gear-wheel 86, and the tumbling-shaft 14, of means for operating said tumbler-head from the tumbling-shaft consisting of a crank applied to the said tumbling-shaft, a lever or walking-beam, a link or connecting-rod joining one arm of the said lever or walking-beam with the crank, and a second link or connecting-rod having the ends thereof united by universal joints with the other arm of the lever and the tumbler-head, substantially as described.

4. The combination with the shaft 80, its pinion 85, the transmitting pinions 81, 82, and 83, the tumbler-head on which said transmitting pinions are mounted, the reversing gear-wheel 86, and the tumbling-shaft 14, of means for operating said tumbler-head from the tumbling-shaft consisting of a crank applied to the said tumbling-shaft, a lever or walking-beam, a link or connecting-rod joining one arm of the said lever or walking-beam with the crank, and a second link or connecting-rod having the ends thereof united by ball and socket connections with the other arm of the lever and the tumbler-head, substantially as described.

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

CHANNING WHITAKER.

Witnesses:

MARY CAVERLY,

SAML. G. STEPHENS.