E. REDFEARN.

Loom-Shedding Mechanism.

No. 141,589. Patented August 5, 1873.

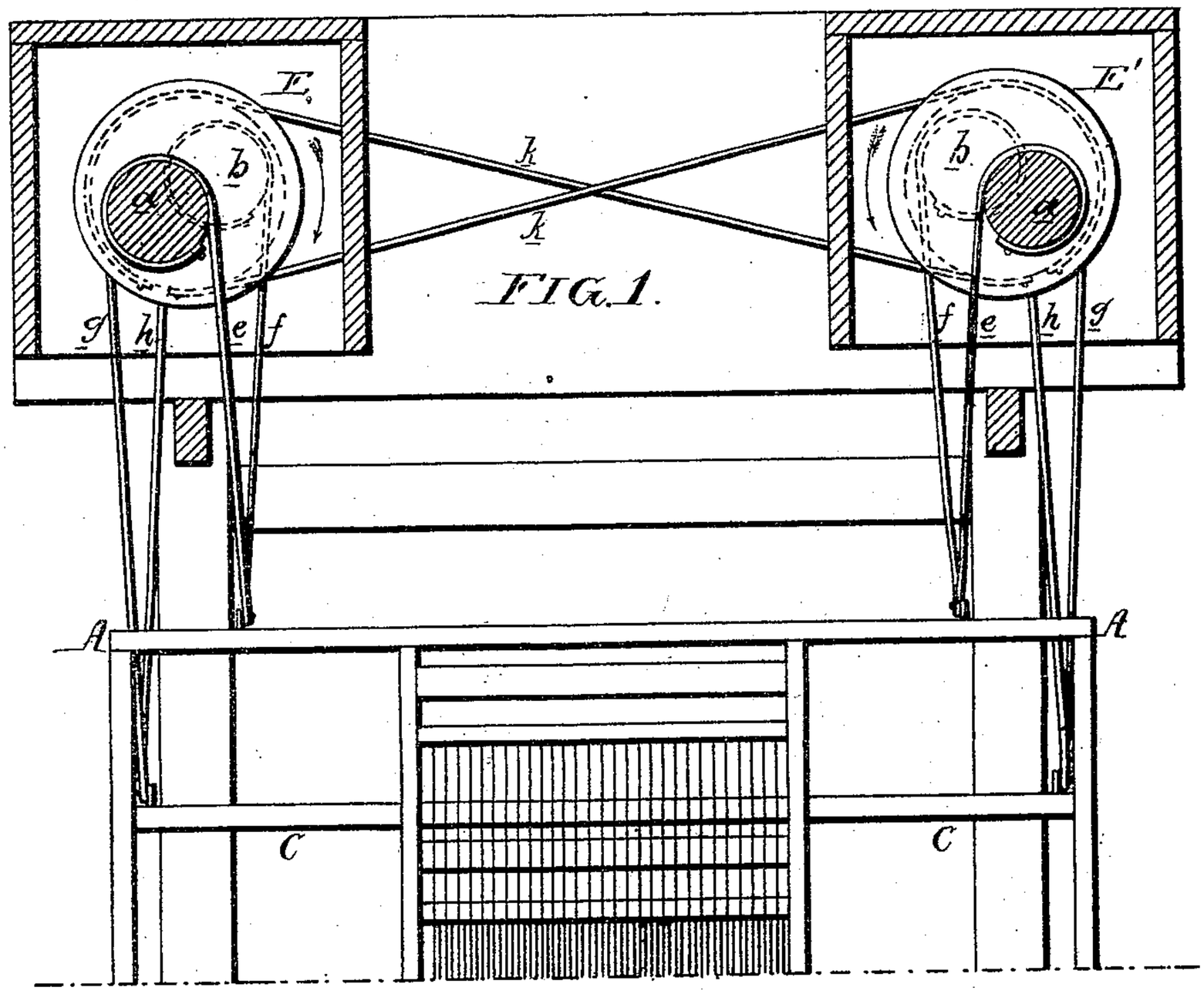


FIG. 1.

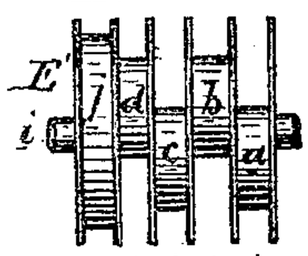


FIG. 2.

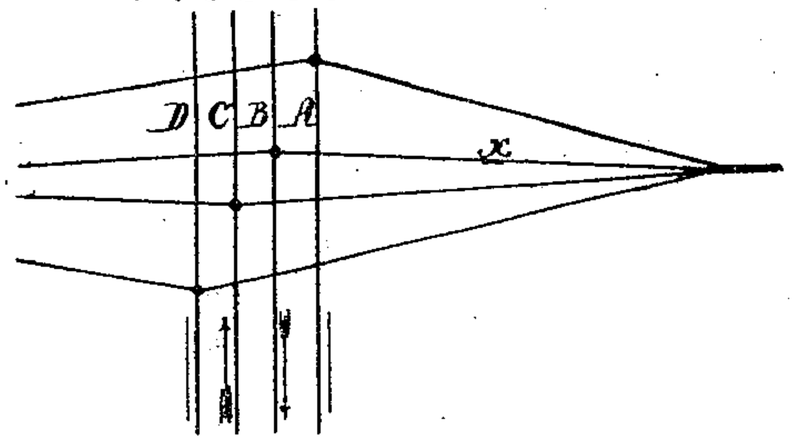


FIG. 3.

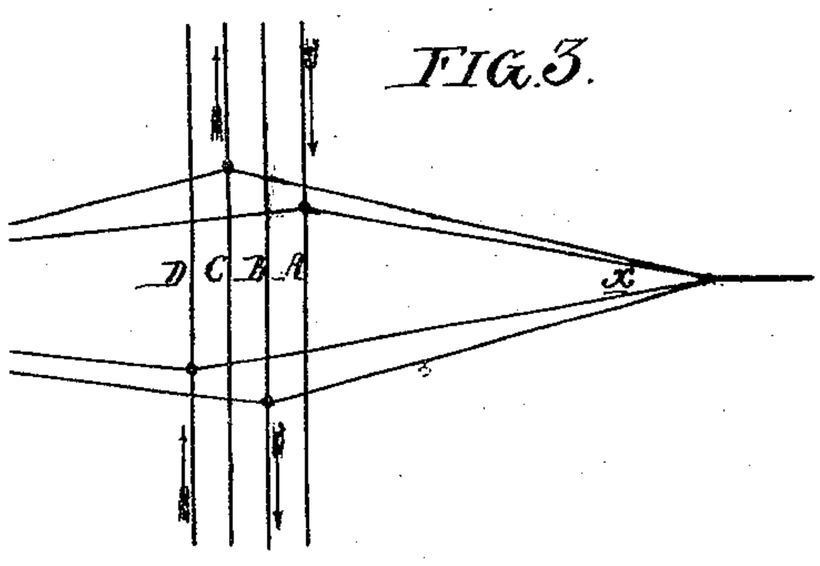


FIG. 4.

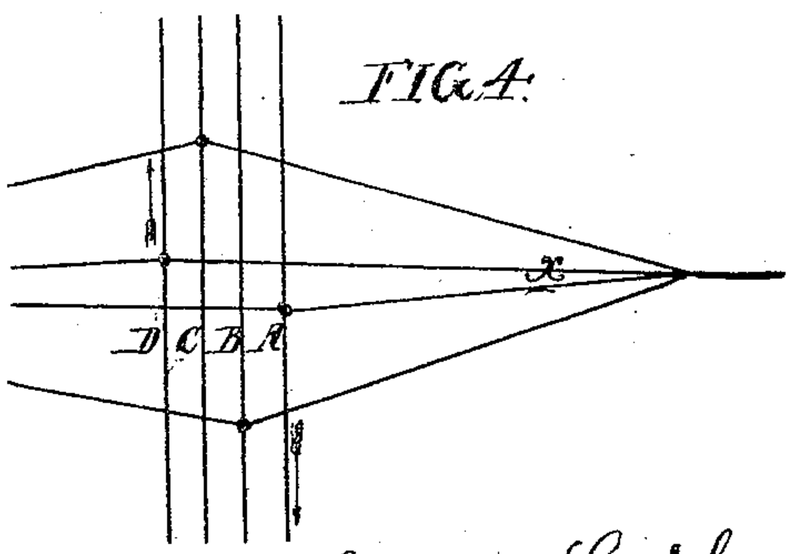
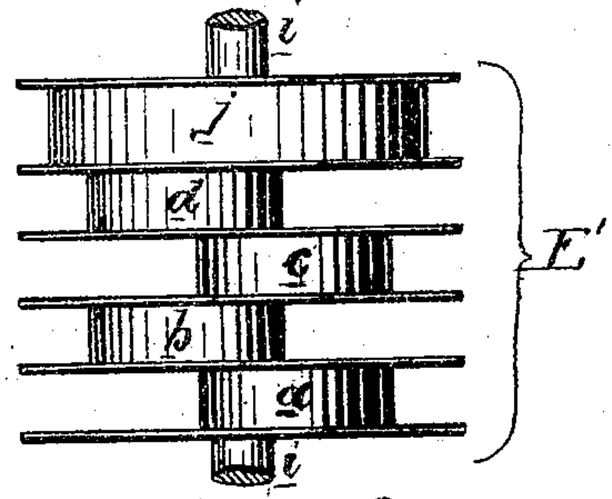


FIG. 5.



Witnesses,
Harry Smith
Thomas McElvain

Edward Redfearn
by his Attys.
Howson and Sons

UNITED STATES PATENT OFFICE.

EDWARD REDFEARN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN LOOM-SHEDDING MECHANISMS.

Specification forming part of Letters Patent No. **141,589**, dated August 5, 1873; application filed June 3, 1873.

To all whom it may concern:

Be it known that I, EDWARD REDFEARN, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Looms, of which the following is a specification:

The object of my invention is to enable the warp-threads in a loom to be crossed or drawn past each other in forming the shed more rapidly and with less difficulty than usual; and I attain this object in the manner shown in the sectional elevation, Figure 1 and diagram Fig. 2 of the accompanying drawing, by so combining the leaves of heddles A B C and D with eccentric pulleys E and E′ that a differential movement shall be imparted to the same, causing the threads *x* to cross each other in sets in forming the shed, and thus avoiding the frictional contact which occurs when the whole number of threads are crossed simultaneously.

My invention will be fully understood from the following detailed description:

The warp-threads *x*, (see diagrams, Figs. 2, 3, and 4,) instead of being divided into two sets, controlled by two leaves of heddles or two sets of leaves, operated alternately, as is usual for plain classes of work, are separated into four sets, controlled by as many sets of heddles, A,B, C, and D, the latter being operated, in the usual manner, by treadles or otherwise. Directly above these leaves of heddles are two pulleys, E and E′, capable of turning freely upon the journals of their spindles *i*, and having at one or both ends concentric grooved or flanged wheels *j*, (Fig. 5,) through the medium of which and crossed belts *k* simultaneous movement of the two pulleys in opposite directions is insured, as indicated by the arrows in Fig. 1. Each pulley, E, is composed of four minor eccentric pulleys, *a*, *b*, *c*, and *d*, which are situated directly over the corresponding leaves of heddles A, B, C, and D, and from which the latter are suspended at their opposite ends by straps *e*, *f*, *g*, and *h*. (See elevation and plan views, Figs. 1 and 5.) The straps are wound around their respective pulleys, and are connected to the same at their extreme ends only, as shown, so that when the said pulleys are turned the straps must be either wound upon or unwound from the same, according to the direction of the movement. Another peculiarity is that the straps *e* and *f* pass round their pulleys *a* and *b* in one direction, while the straps *g* and *h* pass around the corresponding pulleys *c* and *d* in the opposite direction, the consequence being that, when the pulleys E and E′ are turned in the direction indicated by the arrows, the straps *e* and *f* will be unwound from their respective eccentric pulleys and their leaves of heddles A and B lowered, although differentially and at different rates of speed in respect to each other, simultaneously with the winding up of the straps *g* and *h* upon their eccentric pulleys *c* and *d*, and the raising of the leaves of heddles C and D, the movements of which will correspond exactly with those of the leaves A and B, except that they will be in a reverse direction.

The method of obtaining the differential movement of the straps and heddles will be understood by referring to Fig. 1, where it will be observed that when the pulley E′ is turned in the direction of its arrow the eccentric pulley *b* will be lowered simultaneously with the raising of the eccentric pulley *a*, and that during this movement both of the straps *e* and *f* will be unwound and lowered, but the latter much faster than the former, while if the movement be continued until the pulley *a* is directly over the pulley *b*, the rate of lowering of the two straps will then be nearly equal, and after passing this point the strap *e* will be lowered the fastest. In other words, starting at the point shown in Fig. 1 to lower the two straps *e* and *f*, the former will have a constantly-increasing and the latter a constantly-decreasing downward movement, and the upward differential movement of the other straps *g* and *h* will be in exact accordance with said downward movement.

The effect of these differential movements upon the heddles and warp-threads *x* controlled by the same is illustrated in the diagrams, Figs. 2, 3, and 4, in which the heddles A and B are represented as descending, and the heddles C and D as ascending.

The movements of the heddles A and D are at first slow, while those of the heddles B and C are much faster, so that the threads controlled by the latter will first cross each other,

and then the threads controlled by the heddles A and D, in order to reach the position shown in Fig. 3. During this time the rate of movement of the heddles A and D has been gradually increasing, and their threads now cross each other, as indicated in Fig. 4, their rate of movement increasing, and that of the heddles B and C correspondingly decreasing until the heddles A and B and C and D are brought into line with each other and the shed fully opened.

The advantage possessed by this method of working is that, as the whole number of threads are not crossed simultaneously, but in sets, the frictional contact between the same is very considerably reduced, so that the loom can be worked faster and with less power than usual, while the abrasion and breaking of the threads are avoided, and the quality of the work much improved.

I do not desire to confine myself to the use of four eccentric pulleys and sets of heddles, as any greater number may be employed.

I claim as my invention—

The combination, substantially as described, of compound eccentric pulleys E E′, with leaves of heddles suspended from and controlled in their movements by the said pulleys, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD REDFEARN.

Witnesses:

WM. A. STEEL,

HUBERT HOWSON.