

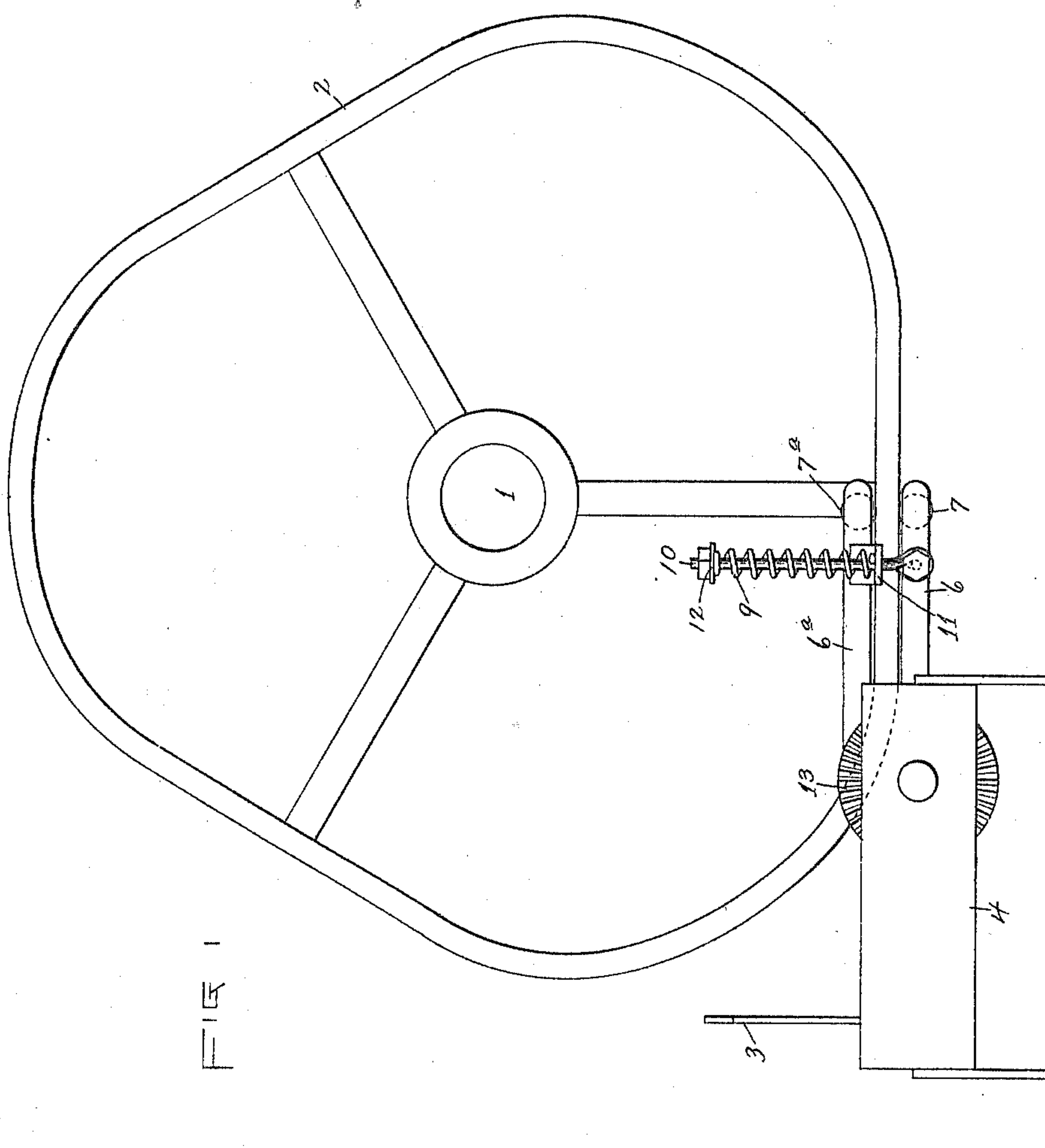
No. 811,590.

PATENTED FEB. 6, 1906.

N. SMARUP.  
NEEDLE OPERATING MECHANISM FOR LOOMS.

APPLICATION FILED APR. 26, 1905.

2 SHEETS—SHEET 1.



WITNESSES

*S. B. Booth.*  
*E. M. O'Reilly.*

INVENTOR

*Nelson Smarup*  
*By Mosher & Curtis*  
*Attys.*

No. 811,590.

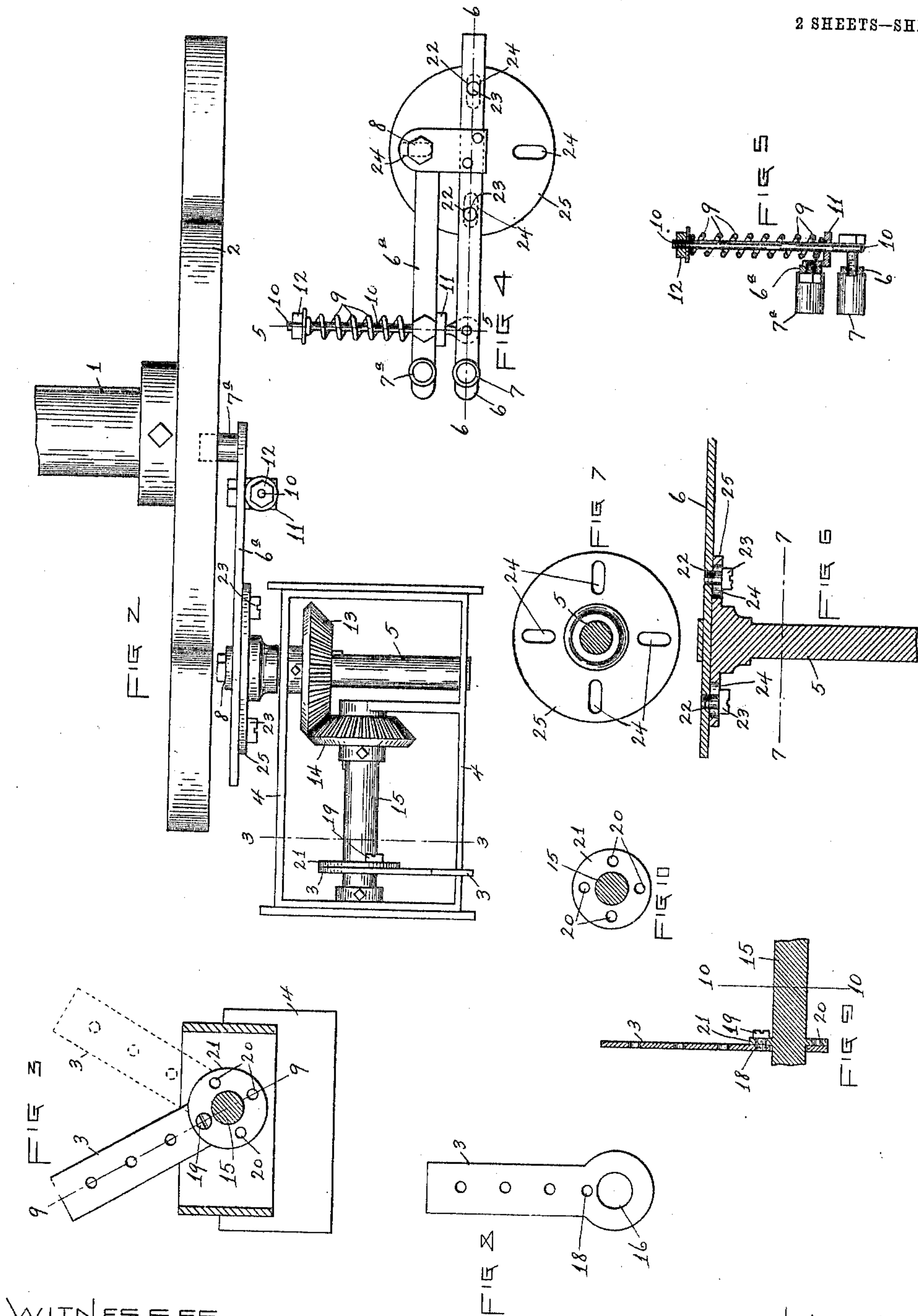
PATENTED FEB. 6, 1906.

N. SMARUP.

NEEDLE OPERATING MECHANISM FOR LOOMS.

APPLICATION FILED APR. 26, 1905.

2 SHEETS—SHEET 2.



WITNESSES  
S. B. Booth  
E. M. O'Reilly.

INVENTOR  
Nelson Smarup  
By Mosher & Curtis  
Attys.



# UNITED STATES PATENT OFFICE.

NELSON SMARUP, OF AMSTERDAM, NEW YORK.

## NEEDLE-OPERATING MECHANISM FOR LOOMS.

No. 811,590.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed April 26, 1905. Serial No. 257,436.

*To all whom it may concern:*

Be it known that I, NELSON SMARUP, a citizen of the United States, residing at Amsterdam, county of Montgomery, and State of New York, have invented certain new and useful Improvements in Needle - Operating Mechanism for Looms, of which the following is a specification.

The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in elevation looking toward the end of the needle-cam shaft of an Axminster loom, showing the needle-cam, needle-arm, and intermediate mechanism constructed in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a cross-section of the same, taken on the broken line 3 3 in Fig. 2. Fig. 4 is a view in side elevation of the cam-follower mechanism on the rocker-arm, showing the side opposite that shown in Fig. 1. Fig. 5 is a vertical cross-section of the same, taken on the broken line 5 5 in Fig. 4. Fig. 6 is a central vertical section taken on the broken line 6 6 in Fig. 4 through the connection between rocker-arm 6 and its rock-shaft. Fig. 7 is a cross-section of said rock-shaft, taken on the broken line 7 7 in Fig. 6, showing in elevation the slotted flange to which the rocker-arm is attached. Fig. 8 is a plan view of the needle-arm detached. Fig. 9 is a section taken on the broken line 9 9 in Fig. 3 longitudinally of the needle-arm and the rock-shaft upon which the same is mounted. Fig. 10 is a cross-section of the needle rock-shaft, taken on the broken line 10 10 in Fig. 9, showing in elevation the flange thereon to which the needle-arm is attached.

The object of my invention is to provide a simple and durable means for transmitting motion from the needle-cam to the needle-arm in an Axminster loom.

As my invention does not appertain to the general construction of the loom, I have shown in the drawings only those parts of the ordinary loom between which my novel mechanism is to be interposed and transmit motion.

Referring to the drawings, wherein the invention is shown in its preferred form, 1 is the needle-cam shaft, 2 is the needle-cam fixed thereon, and 3 is the needle-arm capable of vibrating movements in a plane at right angles to the plane of the cam and parallel with the cam - shaft. These parts just referred to are substantially the same in construction and function as the like parts found in the ordinary construction of Axminster looms, and for the purpose of a clear understanding of my invention it will be only necessary to bear in mind that the needle-cam shaft 1 is rotated in the usual manner and that the vibrating movements of the needle-arm 3 impart to the needle the usual movements in the operation of the loom. The cam 2 is in the form of a rim or flange and is shown as a triplicate cam, which is the form usually employed.

Rotatively mounted in bearings in a stationary frame 4 is a rock-shaft 5, upon which is fixed a rocker-arm 6, provided with a pair of cam-followers 7 and 7<sup>a</sup>, adapted to engage one the inner side and the other the outer side of the cam-rim, whereby rocking movements in opposite directions are positively imparted to said rock-shaft 5 as the cam rotates. The cam-follower 7 is mounted directly upon the rocker-arm 6, while the follower 7<sup>a</sup> is mounted upon an auxiliary arm 6<sup>a</sup>, pivotally mounted upon the arm 6 at 8 and adapted to be yieldingly forced toward the arm 6 by means of a coil-spring 9, embracing an eyebolt 10, which is connected with the arm 6 and passes loosely through a flange 11, offset from the arm 6<sup>a</sup>, which spring bears at one end upon said flange 11 and at the other end upon a nut 12 on the end of said eyebolt. Fixed upon the rock-shaft 5 is a beveled gear 13, adapted to mesh with a beveled gear 14, fixed upon a rock-shaft 15, rotatively mounted upon the frame 4 at right angles to the rock-shaft 5. The needle-arm 3 is fixed upon the rock-shaft 15 in the form of a rocker-arm. It will thus be seen that the rocking or vibrating movements imparted to the rocker-arm 6 by the cam 2 are transmitted to the rock-shaft 5 and therefrom through the beveled gears 13 and 14 to the rock-shaft 15, upon which is fixed the needle-arm, thereby imparting to said arm vibrating movements adapted for the performance of its needle - operating function in the usual manner. The beveled gears 13 and 14 are preferably keyed upon or made integral with



their respective shafts, so as to preclude any lost motion between said gears and their respective shafts.

When the gears have become worn at one point, the needle-arm and the rocker-arms can be detached from their respective shafts, said shafts given a partial rotation sufficient to bring into engagement new surfaces on their respective gears, and the needle-arm and rocker-arm fixed upon the respective shafts in accordance with the new positions assumed thereby. In this manner the life of the apparatus can be greatly prolonged.

To provide for such adjustment, I have shown the respective rock-shafts provided with means whereby their respective rocker-arms can be positively connected therewith in each of four different positions, and as the rocking movement is only approximately ninety degrees I am thus able to change the adjustment three different times, bringing into engagement at different times each of four different sets of surfaces on the respective gears. The needle-arm is provided with an aperture 16, adapted to receive the rock-shaft 15, and also with a screw-aperture 18, adapted to receive a screw 19, inserted through either of the four apertures 20, formed in the flange 21, integral with said rock-shaft. In like manner the rocker-arm 6 is provided with two screw-holes 22, adapted to receive the respective screws 23, inserted through diametrically opposite slots 24, of which four are provided in the flange 25, integral with the rock-shaft 5. The slots 24 extend radially of the flange or disk 25, and by loosening the screws 23 a longitudinal adjustment of the rocker-arm 6 can be secured which will vary its effective length, whereby the throw of the needle-arm can be regulated with great precision.

The mechanism shown is cheap and simple and positive in its operation and practically eliminates lost motion and enables me to dispense with a more or less complicated arrangement of cams, links, levers, &c., now commonly employed in transmitting motion to the needle-arm from the needle-cam.

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

1. In an Axminster loom, the combination with the needle-arm and the needle-cam; of a pair of rock-shafts at right angles to each other, upon one of which is fixed the needle-arm; beveled gear connections between said rock-shafts; a rocker-arm fixed upon the

other of said rock-shafts; and a cam-follower on said rocker-arm engageable with said cam.

2. In an Axminster loom, the combination with the needle-arm and the needle-cam; of a pair of rock-shafts at right angles to each other upon one of which said needle-arm is fixed; a rocker-arm fixed upon the other of said rock-shafts; a cam-follower on said rocker-arm engageable with said cam; a pair of intermeshing beveled gears on the respective rock-shafts capable of rotative adjustment each relatively to the arm on its shaft; and means for locking each of said beveled gears in adjusted position relatively to the arm on the shaft thereof.

3. In an Axminster loom, the combination with the needle-cam; of a pair of rock-shafts at right angles to each other; a pair of intermeshing beveled gears keyed or otherwise permanently secured against rotation on the respective shafts; a pair of rocker-arms, one of which is the needle-arm; means for securing each of said rocker-arms in different positions of angular adjustment upon one of said rock-shafts; and a cam-follower on the other of said rocker-arms engageable with said cam.

4. In an Axminster loom, the combination with the needle-arm and the needle-cam; of a pair of rock-shafts at right angles to each other upon one of which is fixed the needle-arm; beveled gear connections between said rock-shafts; a rocker-arm capable of longitudinal adjustment upon the other of said rock-shafts; means for locking said rocker-arm in different positions of longitudinal adjustment upon its rock-shaft; and a cam-follower on said rocker-arm in engagement with said cam.

5. In an Axminster loom, the combination with the needle-arm and the needle-cam; of a pair of rock-shafts at right angles to each other upon one of which said needle-arm is fixed; a pair of intermeshing beveled gears on the respective rock-shafts; a rocker-arm fixed upon the other of said rock-shafts; and a pair of cam-followers mounted upon said rocker-arm engageable with opposing surfaces on said cam.

In testimony whereof I have hereunto set my hand this 20th day of April, 1905.

NELSON SMARUP.

Witnesses:

VEEDER CALDWELL,  
EBEN HUMES.