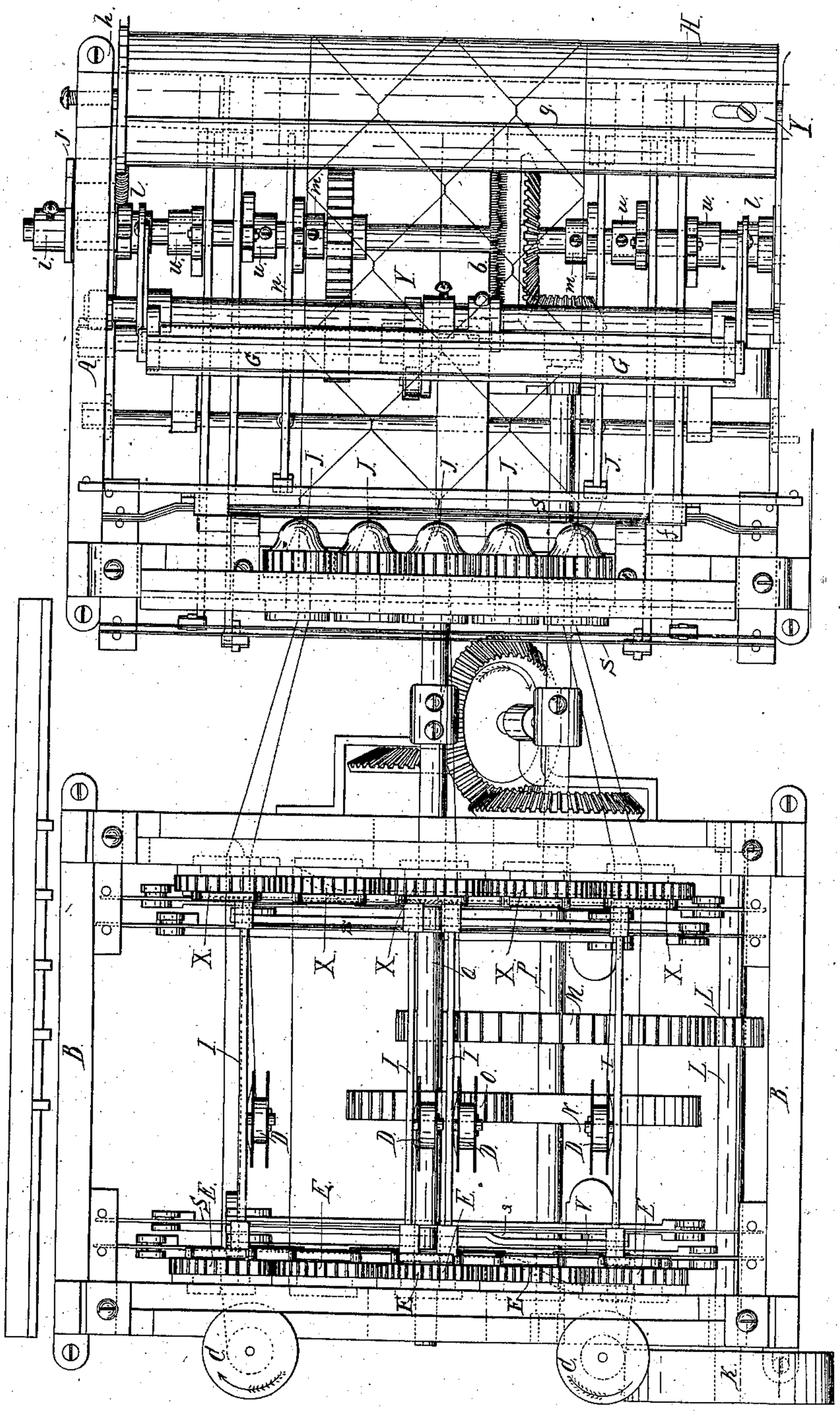
4 Sheets—Sheet 1.

J. NESMITH.

WIRE NETTING MACHINE.

No. 10,743. Patented Apr. 4. 1854.

Fig. 1.



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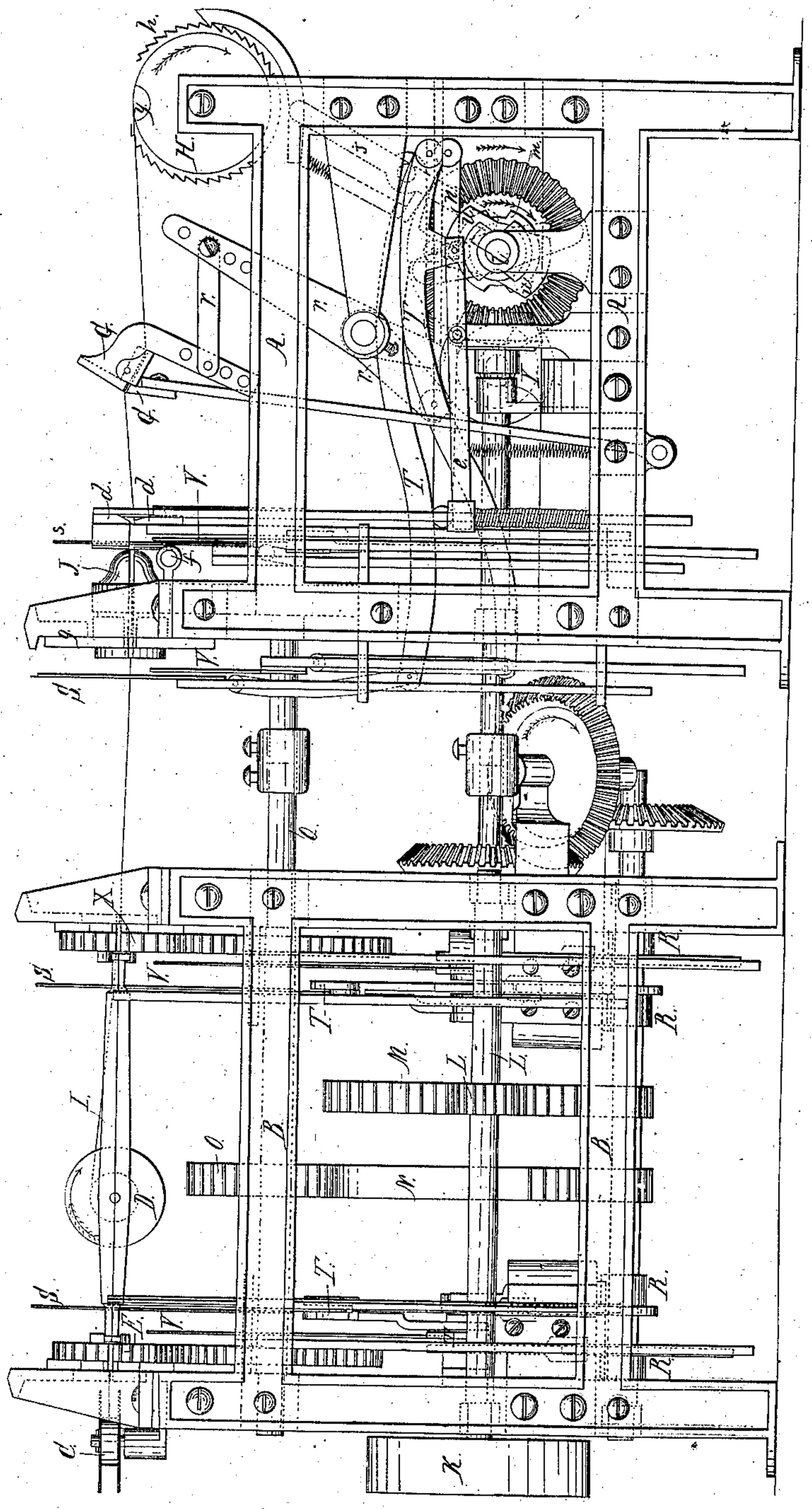

Fig. 2.

4 Sheets—Sheet 3.

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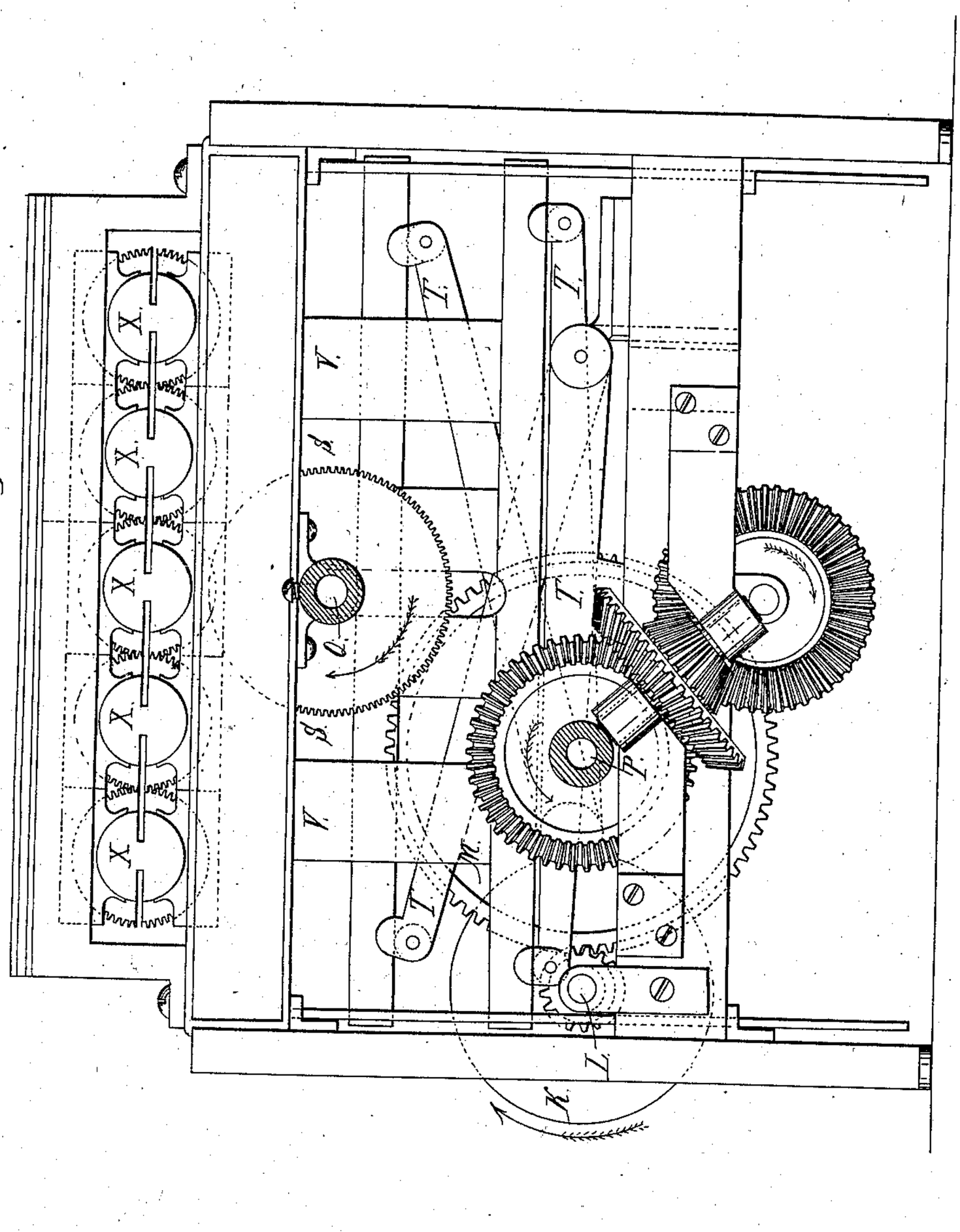
Fig 3.



4 Sheets—Sheet 4.

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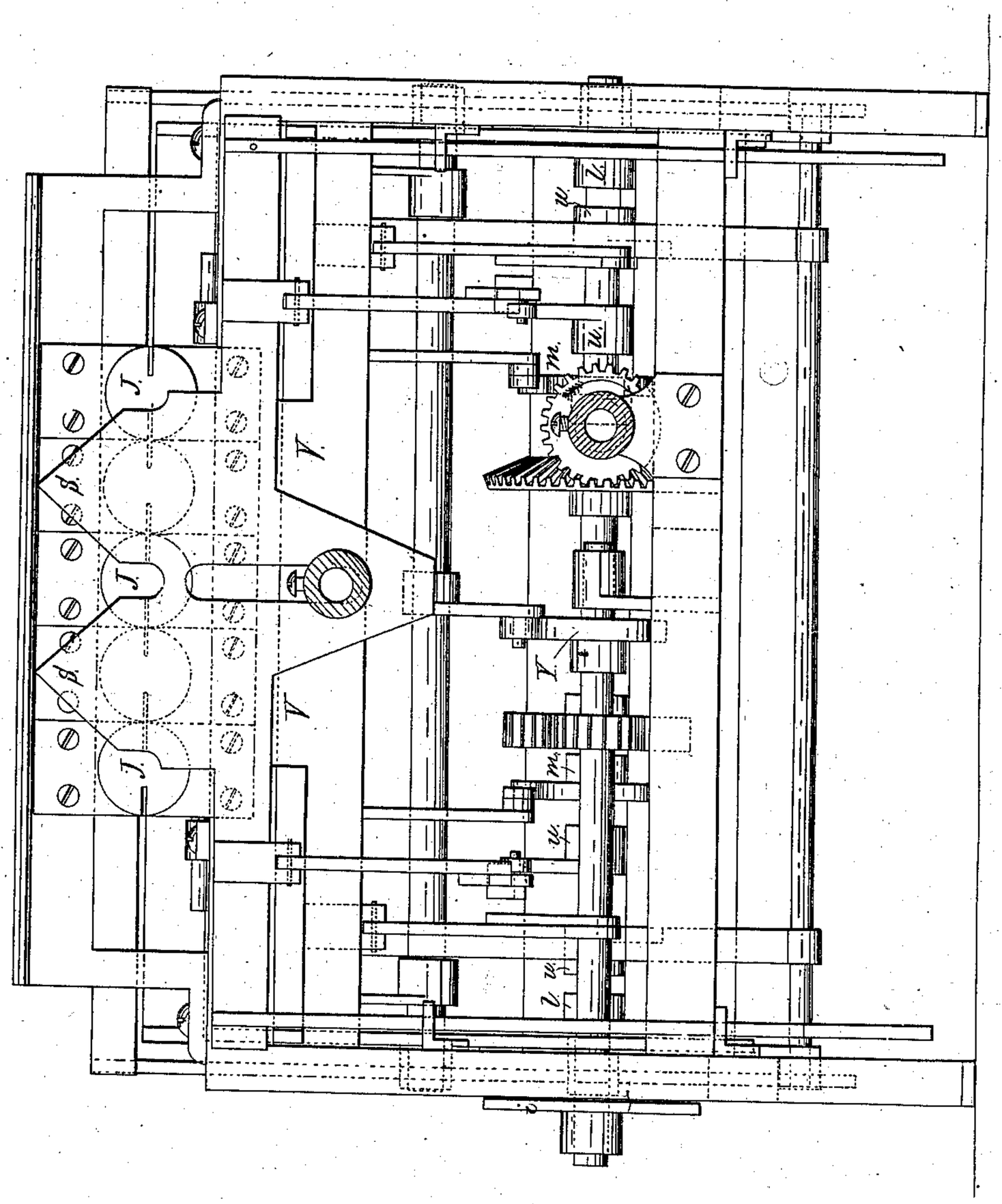
Fig. 4.



UNITED STATES PATENT OFFICE.

JOHN NESMITH, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR MAKING WIRE-NETTING.

Specification forming part of Letters Patent No. **10,743**, dated April 4, 1854.

To all whom it may concern:

Be it known that I, JOHN NESMITH, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Machine for the Manufacture of Wire-Netting and Wire Fence by Power; and I do hereby declare that the same is fully and clearly described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1 denotes a plan. Fig. 2 denotes a side elevation. Fig. 3 denotes an elevation of one of the parts of my netting-machine, which may be called the "feeder." Fig. 4 is an elevation of the other principal part of my machine, which I call the "twister." Figs. 3 and 4 show the two principal parts of the said machine as disconnected from each other, or an inside view or elevation of each part when they are connected to each other.

The principal and main features of novelty of my invention consist in the principle of the revolving of the wires parallel to each other at the same time they are being twisted, and the other parts and movements of my machine to produce the effects hereinafter described.

To carry out my invention and design fully, and first to manufacture my wire-netting and wire-fence machines, it is the best plan, in my opinion, to construct the various parts of said machines of such materials as are hereinafter named. The frames should be of cast-iron, also the cams, the stands, and gearing of the same material. The levers and shippers throughout should be of wrought-iron. The jaws G G may be made of cast-iron, to which must be attached pieces of steel where the same come in contact with the wires. The netting beam or cylinder H may be made of hard wood, with iron centers, and the ratchet-gear on said cylinder may be of cast-iron. The center part of the wire-reels may be made of wood, with a sheet-iron rim on flange on each side.

It will be readily understood by any good practical workman, by inspecting the inclosed drawings and specification, and following out the details described hereinafter, how to make, construct, and use my wire-netting machines. It is necessary to have machines for making every different size of the netting or fence—that is, for every different size of the meshes of the same—and any width of the netting less than the whole scope of the machine can be made by simply drawing in the number of wires desired, as will be understood hereinafter; and in proceeding to operate or use my netting-machines it will be seen by examining the drawings that the same are composed of two parts connected together by two shafts, as seen at P and Q, Fig. 1, and one of the said parts I call the "twister," the frame of which is shown at A A, Fig. 2. The other part I call the "feeder," the frame of which can be seen at B B, Fig. 2.

The border-wire to netting and top and bottom wire in fence is usually larger than the wire to be twisted, although the wires can all be of the same size, if desired. The wire is placed upon the reels C C, Fig. 1, and then one end of the same is passed through a hole which is drilled in the center of the four outside gears, E E and X X, Fig. 1. The said wires are then passed to the twisting part of the machine, and through holes drilled in the centers of the two outside twisting-gears, J J, Fig. 1. Then the said wire is passed between the jaws G G, Fig. 2, and then to the cylinder H, as seen at Figs. 1 and 2, and firmly secured to the same by a clamp, *g*, and a catch, *y*, which can be seen at Figs. 1 and 2, then the wires to be twisted, which are wound upon or around the reels D D D D, Fig. 1. Said reels are then placed upon the stands I I I I, Figs. 1 and 2, on which they revolve as the wire is being drawn off from them. One end of the wire on each of the four reels D D D D is then passed through one end of the reel-stands I I I I, Fig. 1, thence to and through the slots in the twisting-gears J J J J, Fig. 1, and then they are passed between the jaws G G, Fig. 2, and thence to the cylinder H, Figs. 1 and 2, and secured to the said cylinder by the same contrivance as the border-wires, before described. The said wires being all adjusted, as above mentioned, the power is applied to the driving-pulley K, Fig. 1, which is conveyed to the shafts P and Q, Fig. 1, by means of the shaft L and gears L and M, as seen at Fig. 1. The shippers S S S S, Figs. 1 and 2, being first raised by the cams R R and U U, Fig. 2, operating against or raising the levers T T, which are shown in Fig. 2, it be-

ing understood that the shippers S S in the twisting part of my machine act in concert with and simultaneously with the shippers S S in the feeding part of my machine. By this movement they are brought into the position as shown in Fig. 2 of the drawings, and then stop moving, and as soon as the movement of the said shippers ceases the twisting-gears J J J J J, Fig. 1, and the feeding-gears E E E E E and X X X X X, as seen at Fig. 1, make two revolutions, they revolving exactly with each other, so as to keep the wires parallel and from getting entangled with each other, two revolutions of the said gears being all the twisting that is necessary at each end of the meshes in the netting and fence for making good substantial work, although more or less twisting of the wire may be obtained, if desired, by altering the gearing in the following manner—viz., by enlarging the gear N, Fig. 1, if more than two revolutions are required of the said twisting and feeding gears, and by reducing the gear N, Fig. 1, if less than two revolutions are wanted in the said feeding and twisting gears at each end of the meshes in the netting.

The before-mentioned gears J J J J J and E E E E E and X X X X X, after making two revolutions, as before stated, cease moving, which is effected by a part of the teeth of the gear N, Fig. 1, being cut off from its periphery, and as the said twisting and feeding gears stop revolving in such position that the slots in the said gears are on a line with each other, so that the wires can be shipped from one set of gears to the others by the shippers S S S S, Figs. 1, 2, 3, and 4, and so that the wires can be shipped back from one set of gears to the others by the shippers V V V V, Figs. 1, 2, 3, and 4, it being understood that the said feeding and twisting gears revolve and stop alternately—that is, they revolve when the shippers cease moving, and that the shippers perform their duty while the said gears remain motionless, and as the said gears stop revolving the jaws G G in the twisting part of my machine are moved backward nearly to the twisting-gears J J J J J by the cam Y and arms and connecting-pieces *r*, Fig. 2, and the spring *b*, Fig. 1, and by the peculiar construction of the upper jaw, G, and connecting-pieces *r*, they (the said jaws G G, Fig. 2) are brought together upon the wire and then moved forward, or toward the cylinder H, one-half the length of the meshes of the netting, as will readily be understood by inspection of the drawings, and when the wire is so drawn forward and the jaws G G stop, then the shippers S S S S, Figs. 1, 2, 3, and 4—that is, one of the two sets of shippers on each side of the feeder-frame and one of the two sets of shippers, Figs. 1 and 4, on each side of the twisting-gears—are first raised by the cams R and U, said shippers then remaining in this position until the wire is sufficiently twisted. Then they are depressed or moved downward to their lowest position, as seen at V V V V, Fig. 2. Then the said sets of shippers V V V V, Fig. 2, on each side of the frame B and each side of the twisting-gears J J J J are moved upward by the cams R and U by the same operation as the shippers S S S S, before described, and by the upward movement of the said shippers V V V V the wires are shipped from the position in which they were left by the shippers S S S S to the other feeding and twisting gears, as will be readily understood by inspection of the drawings—that is, one set of shippers move the four inside wires one way and the other set of shippers will move the four inside wires the other way at the required time to harmonize with the other correct movements of the machine. The two outside or border wires never move transversely, but move longitudinally, like the other wires, except that they pass through holes drilled in the center of the four outside feeding-gears and the two outside twisting-gears. The two outside small wires are wound twice around the border wires at every other twisting operation, as will be seen by inspection of Fig. 1.

The reel-stands I I I I, Fig. 1, have each a spring on the side next the reel, the object being to produce friction and to prevent the wire from coming off the reels too easily.

The wire for netting, fencing, &c., should be well annealed. The necessity of this will be readily understood by practical workmen. The take-up motion to the cylinder H, Figs. 1 and 2, is composed of a ratchet-gear, *h*, Fig. 1, and cam *i*, Fig. 1, and lever *j*, Fig. 1.

At *f*, Fig. 2, is shown a shaft which supports a straight-edge, over which the wires travel as they pass through the machine.

d d, Fig. 2, are two movable planes that are moved or brought together by means of the cams *l* and *m*, Fig. 1, and levers *e* and *n*, Fig. 1, the object of the said planes being to guide the wires when they are shipped, and to hold the wires firmly while they are being twisted, so that the wires may not be sprung where they are not twisted, and at the end of each twisting operation they (the said planes *d d*) open or move apart, but are together, as seen at *d d*, Fig. 1. On the top plane, *d*, there are five small vertical projections—one in the front of the center of each gear. These projections are to prevent the wire from being twisted too far into the meshes.

By inspecting the drawings it will be seen that the jaws G G are made in such shape that as they are moved backward by the cam Y and arms *r*, the jaws are opened, and when they are moving forward they are brought in contact with the wire by shutting together, by which operation the said wire is moved from one twisting operation to another, and so on.

It being understood that the take-up motion acts or operates at the right time, so as to keep the wire straight and smooth during

the operation of the said machine, as hereinbefore set forth, and having thus described my invention, I will state my claims as follows:

1. Revolving the wires by the means, substantially as described, for the purposes of keeping them parallel to each other, so that they cannot get entangled with each other during the process of making the netting or fencing.

2. Vibrating the wires alternately from the left to the right, or the right to the left, before or after or at the same time of twisting them (the said wires) together, by means of the cams R and U, the shippers S S and V V, connected to the said cams by levers T T, as seen in the drawings, or substantially the same, for the purposes of making wire netting and fencing.

3. The jaws or clamps G G, or the same in substance, for the purpose of drawing the wire through the machine at the required times by means of the cams and levers operating the same, essentially as laid down in the within specification and drawings.

4. The two planes *d d*, or their mechanical equivalents, with the cams and levers for operating the same, substantially as and for the purposes set forth.

5. The wire-reels and movable reel-stands, with the friction-springs for the reels, and holes through either end of the said reel-stands for admitting, protecting, and guiding the wire, or the mechanical equivalents of the said reels and reel-stands.

6. The feeding and twisting gears, with or without their centers perforated to admit the border or warp wires passing through the same, and the said gears having slots cut in them, for the receiving and sliding of the ends of the stands and wires in the same, substantially as hereinbefore set forth and specified.

JOHN NESMITH.

Witnesses:
SAMUEL C. PRATT,
JOSHUA MERRILL.