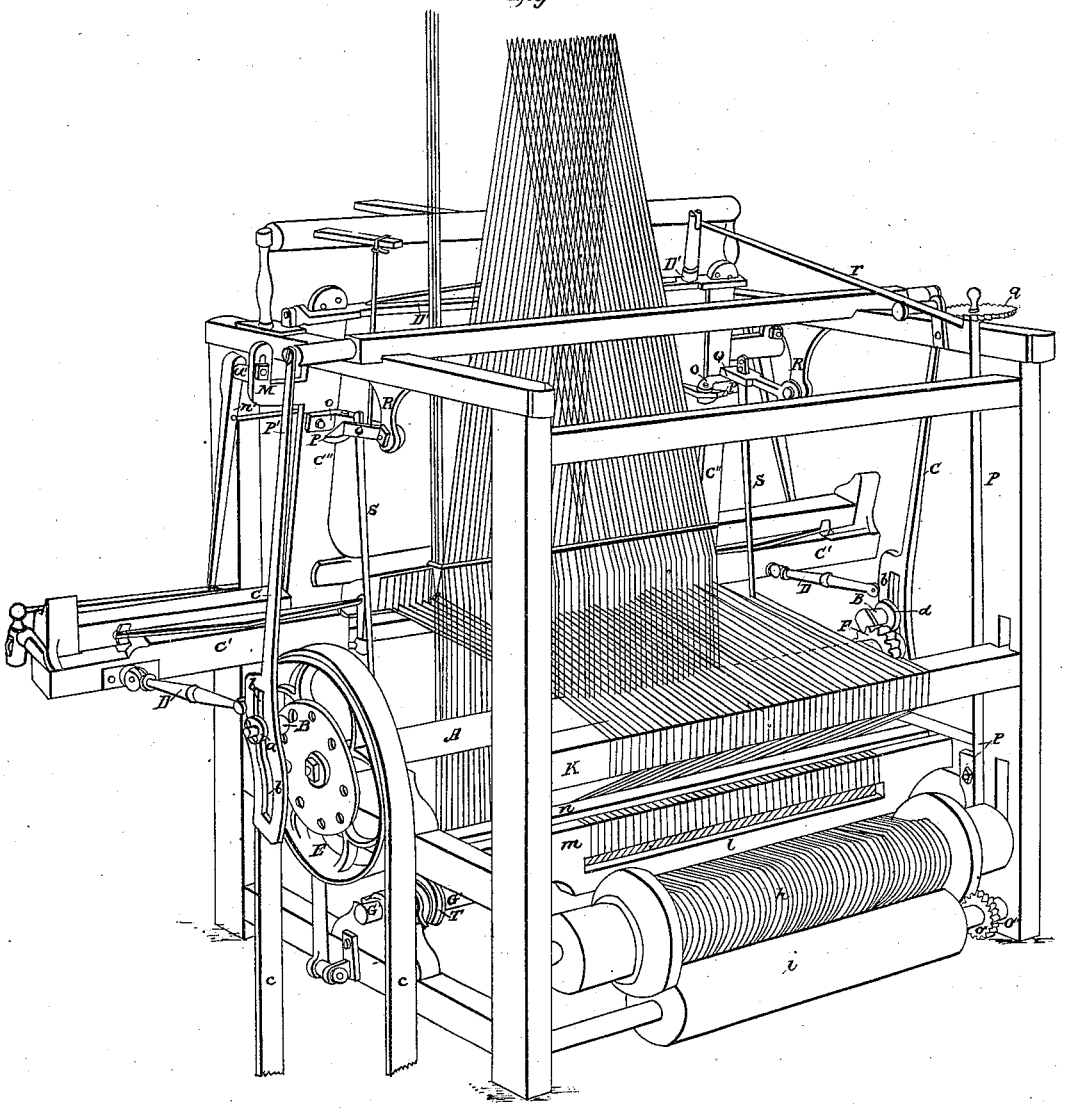
Sheet 1, 5 Sheets.

W. Sherwood.

Loom.

No. 4,644. Patented Jul. 20, 1846.

Fig. 1.

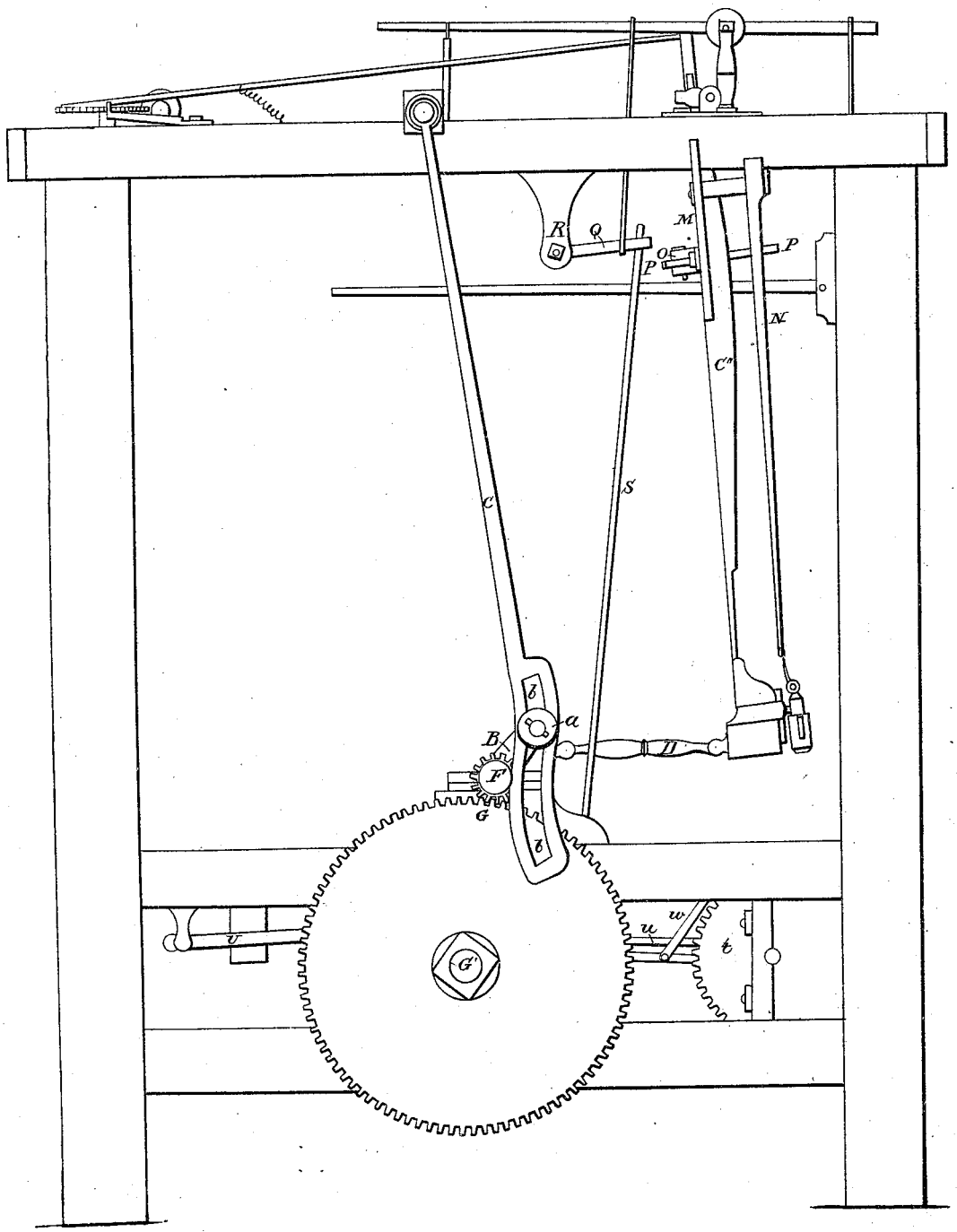


W. Sherwood.

Loom.

No. 4,644. Patented Jul. 20, 1846.

Fig. 2.

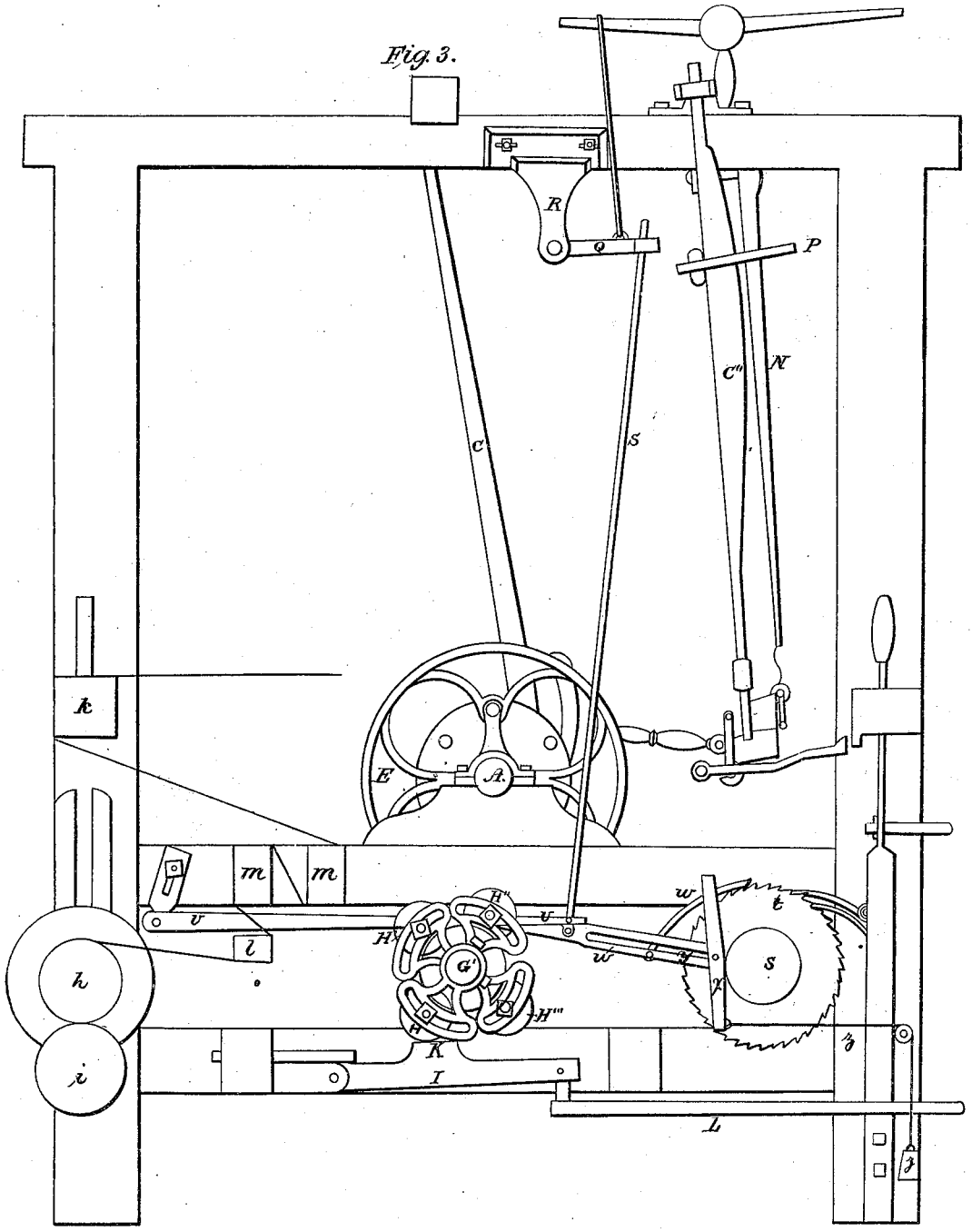


W. Sherwood.

Loom.

No. 4,644. Patented Jul. 20, 1846.

Fig. 3.



W. Sherwood.

Loom.

No. 4,644. Patented Jul. 20, 1840.

Fig. 8.

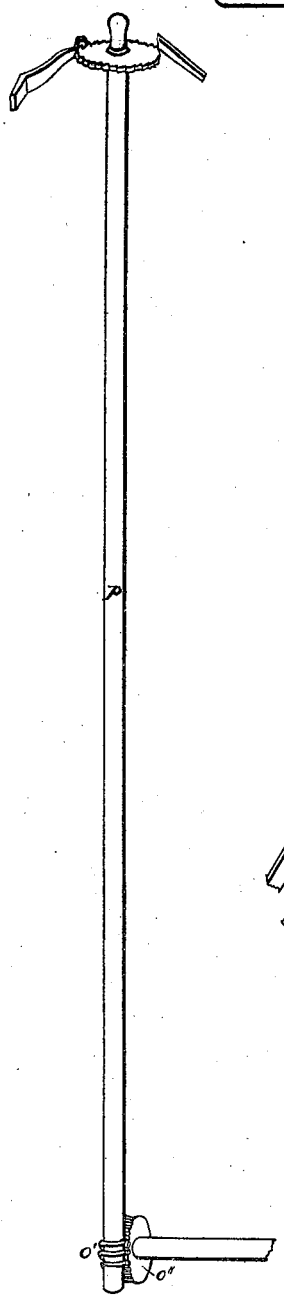


Fig. 5.

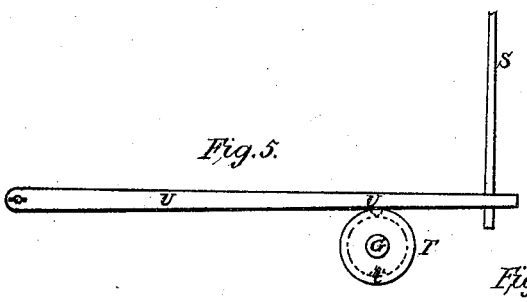


Fig. 9.

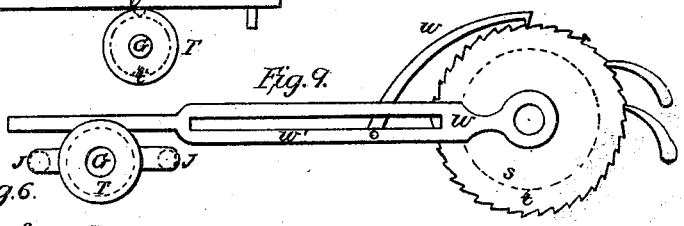
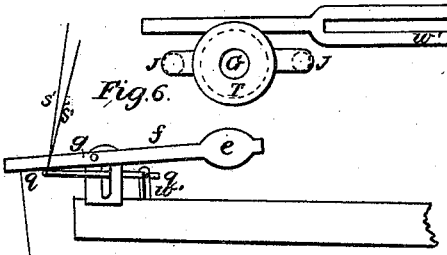


Fig. 6.



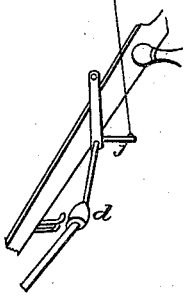


Fig. 10.

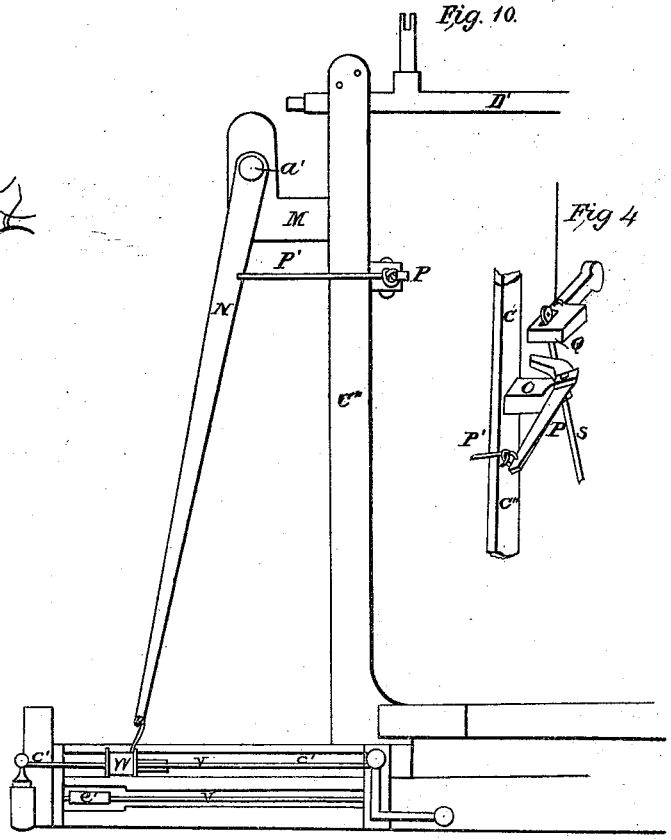


Fig 4

N. Sherwood.

Loom.

No. 4,644. Patented Jul. 20, 1846.

Fig. 16.

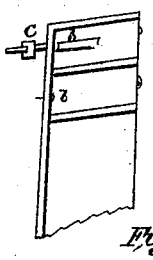


Fig. 17.

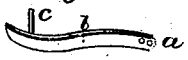


Fig. 11.

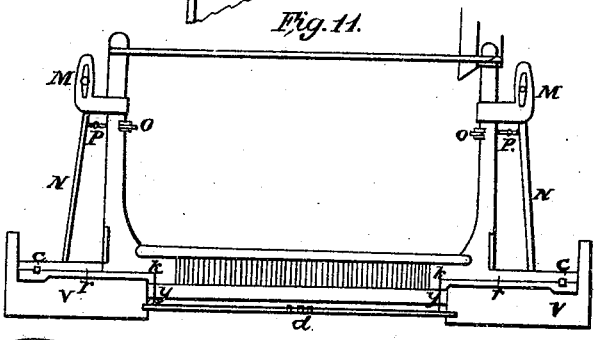


Fig. 15.

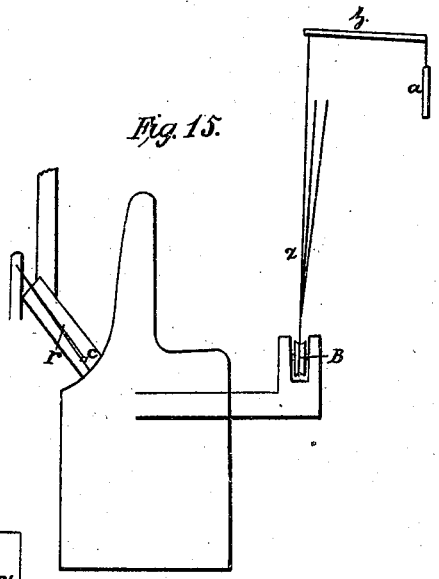


Fig. 12.

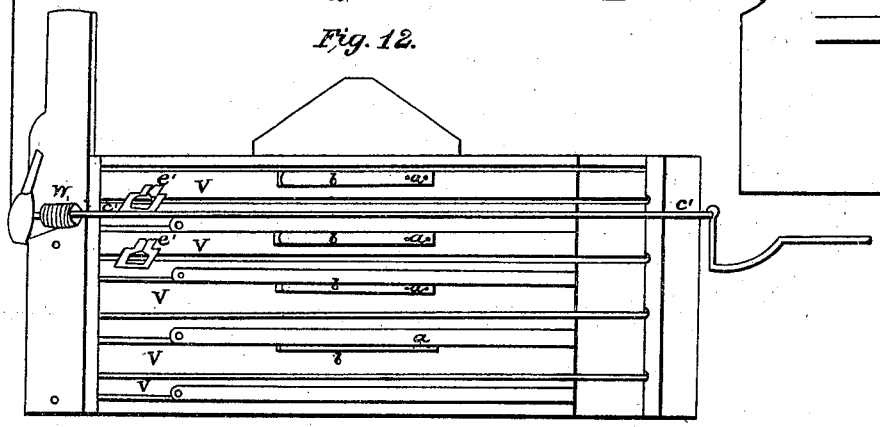
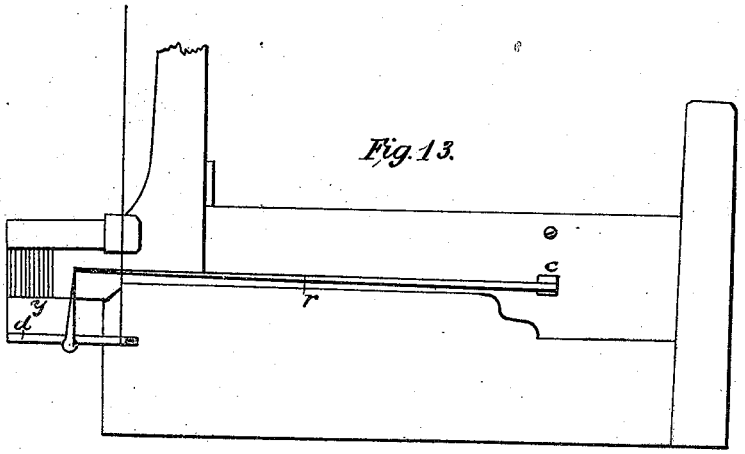


Fig. 13.



UNITED STATES PATENT OFFICE.

WILLIAM SHERWOOD, OF RIDGEFIELD, CONNECTICUT.

CARPET-LOOM.

Specification of Letters Patent No. 4,644, dated July 20, 1846.

To all whom it may concern:

Be it known that I, WILLIAM SHERWOOD, of Ridgefield, in the county of Fairfield and State of Connecticut, have made certain new and useful improvements in looms for weaving ingrain carpets and other articles in which the filling requires frequent changes of two or more shuttles and which are actuated by steam or other motive power; and I do hereby declare that the following is a full and exact description of my said improvements.

In the accompanying drawings I have represented a loom with its frame of wood such as is usually employed in the weaving of carpets; but my improvements may be added to looms having their frames of iron and differing in form from that represented.

Figure 1 is a perspective view of my loom taken from the back and one end thereof. Fig. 2 is an elevation of the opposite end and Fig. 3 a vertical section thereof from front to back; the other figures show parts in detail, to be presently described.

In each of these figures where the same parts occur they are designated by the same letters of reference.

A is a shaft that occupies a situation in rear of the harness and runs in suitable bearings; it has on each end a crank B seen most distinctly in Fig. 2. A driving pulley E is also affixed to this shaft which is shown as embraced by a belt *c c*. With the pulley E, is also connected the apparatus for stopping the loom and for throwing it into and out of gear in the ordinary way.

F is a pinion placed on one end of the shaft A which pinion gears into a wheel G, Fig. 2, that is affixed on the cam shaft G′. The pinion F has usually eighteen teeth, and the wheel G which is two feet in diameter, one hundred and forty four teeth. The pins of the crank B pass through slots *b b* made in auxiliary sword-pieces C C that work on joint pins at their upper ends, and are connected to the lay by the rods D D; *a a* are friction rollers on the pins of the cranks B to enable them to work unobstructedly in the slots *b*, *b*, which have a curved form given to them as represented by which to retard the motion of the lay at the proper time so as to insure the ready action of the shuttles on the protection rod.

The cam shaft G′ carries four cams H H′ H″ H‴ (Fig. 3) that alternately depress four treadles I connected in the usual way with the machinery for forming the figures. Upon each of these treadles there is a shoe K which is broad enough to hold it down until the lay beats up twice, before the cam escapes from it. With the treadles I, I connect four others (L) which may be operated on by the feet of the tender, when it is necessary to get an open pick, to mend the filling, or to change the colors.

I make the lay like such as have been heretofore employed excepting in the following particulars. To give strength to the sword pieces C″ and the rocker D′ (Figs. 1 and 10) to which the sword pieces C″ are attached I make these parts of cast-iron; each of the sword pieces having an arm or elbow piece M extending from it and passing under the plates, or top timbers of the loom and then turning up perpedicularly on their outsides as represented to sustain a joint pin *a′* on which the picker driver staves N N vibrate, these staves being connected at their lower ends with the picker drivers to be presently described.

The picker staves are to be acted upon by what I denominate knee-operators which are so constructed and combined with the lay and with the frame of the loom, as that they may be made to throw any number of shuttles in succession from either end of the lay, and will also allow it to go back any desired number of times without throwing a shuttle.

On the inner side of each lay sword there is affixed a stud or joint piece *o* which sustains the lever P which I denominate the knee operator. The short end of this lever is about 3 inches long, and it is to be operated on by a jointed stop piece Q that is made to use and fall on a stand R to which it is attached by a joint pin, the stand R being affixed to the plate of the loom. This arrangement is in part shown in Figs. 1, 4 and 10; in Fig. 4, the lever P and the stop-piece Q are shown as detached from the lay and from the frame of the loom. From the longer end of the lever P, a strap or cord P′ proceeds and is made fast to the picker staff as shown at *n′* Fig. 1. As the lay passes back and brings the short end of the lever P into contact with the stop Q the long end of said lever acting on a picker staff will throw a shuttle; but if the stop Q be raised above the knee operator P, the picker staves will remain at rest; the stops are to be raised and depressed in the following manner. At each end of the cam

shaft G′ Fig. 5 there is a circular cam T each of which has on its periphery notches t', and upon these cams rest the guide levers U (Figs. 2, 3 and 5) that are hung by joint pins at their rear ends; an angular projection v on the under sides of these levers will fall into the notches t' as the cams T revolve. From the fore ends of each of these levers there extends a lifting rod S, the upper end of which is shouldered and passes through a mortise in the stop-piece Q; as the cam shaft revolves the stop piece will be lifted while the angular piece v rests on the periphery of the cams T, but when it falls into the notch t' the stop pieces will fall so as to be brought into contact with the knee operator P, and a shuttle will be thrown as the lay moves back.

Should it be required to throw four shuttles in succession from each end of the lay, the cams T T must be placed on a shaft which has half the speed of the main cam shaft.

Fig. 10 shows one end of the lay with its shuttle boxes V V two only being represented. W is the picker driver which consists of a cylindrical piece about three inches long and two inches in diameter, and through its center passes a stationary rod c' c' that is made fast to the lay at each of its ends; and does not rise with the shuttle boxes; the pickers e' e' run upon their proper rods which rise and fall with the shuttle boxes in the usual way; the rod upon which the driver W is placed stands about an inch and a quarter forward of the picker rods; that pickers e' e' project forward about an inch from their rods (Fig. 12) so that the drivers may act properly upon them, and they reach within about half an inch of the back of the box; the picker driver is to be drawn back in the same way in which double box pickers are usually drawn back as Fig. 15, B the pulley Z the lever and a the weight. The shuttle boxes are connected with, and operated upon by, the treadles which form the ground of the carpet in the ordinary way. At Fig. 12 five shuttle boxes are represented with two pickers acting in the same way.

I place the protection rod Figs. 11 and 13, d, upon the back of the lay with a finger y y, standing perpendicularly upon each end of the rod. Each finger has a lever one end of which runs through a hole in the upper end of the fingers k k, forming a joint, and lies horizontally upon the top of the lay having a fulcrum pin r r near the center, and the outward ends c c are operated upon alternately by the springs b b b b Fig. 12 in each shuttle box. The inward ends of said springs, a a a a is made fast to the back board of each box and near the other end is a pin (Fig. 17, c,) which goes through the back board and projects beyond it about half an inch when a shuttle is within the box b b Fig. 16. I make use of a spring in the usual way to keep the protection rod prepared to stop the loom when the lay beats up if it is not counteracted by a shuttle, but in order to allow the lay to beat up twice to each thread of the filling and in order also to prevent the protection rod from interfering with the shuttle boxes when they move I overpower the action of the spring by means of a weight the action of which is to be taken off by that of each of the treadles just before a shuttle is thrown.

In Fig. 6 e is a weight on the end of a lever e'' having a fulcrum pin at g inside of the plate of the loom. From this descends a cord h' the lower end of which draws upon a short finger j attached to the protection rod and projecting horizontally from it (Fig. 11 j) thereby counteracting the action of the spring as above stated. A lever q q crosses under said lever f at right angles about one inch from the fulcrum pin g, and upon the side of it which is nearest to the weight. One end of the lever turns upon a joint pin at w and the other end is connected by two cords s' s' one to that part of the figure machine which raises the ground and the other to that part which raises the figure of the carpet. The action of the weight is thereby taken off just before a shuttle is thrown and allows the protection rod to act freely upon said pin in the shuttle boxes at the proper time.

The yarn beam h (Figs. 1 and 3) rests upon a roller i, its gudgeons passing into slots in the posts of the frame so as to allow it to rise or fall according to the quantity of yarn upon it; from this yarn beam the yarn passes under a piece of timber l (Fig. 3) that extends from side to side of the loom thence over a piece m then under another piece n situated as represented, and over as many more pieces if necessary before it goes over the dead beam k to the harness by which arrangement the warp is kept at a proper degree of tension and the yarn beam is prevented from slipping on the roller when the yarn is tight enough to weave.

To give the proper feed so as to deliver the yarn in such quantity as will suit any uniform number of picks to an inch I put a ratchet wheel q on the upper end of a shaft p, (Figs. 1 and 8) which wheel is acted on by a feed hand r operated by the rocker D′ Fig. 1, the wheel q will consequently be turned to the distance of one notch every time the rocker vibrates, and by adapting ratchet wheels varying in the number of teeth any required feed may be obtained. On the lower end of the shaft p there is an endless screw o' that gears into

a toothed pinion o'' on the roller i thus giving motion to the yarn beam.

Each figure of a carpet has an equal number of threads of filling and in order to make them match it is necessary that each thread of the filling be it coarse or fine should occupy an equal space, and by connecting the endless screw with the roller which operates the yarn beam and turning the screw an equal distance at every vibration of the lay that effect is produced which cannot be done in the ordinary way.

The situation of the cloth beam is shown at s (Fig. 3.). Upon each of its ends there is a ratchet wheel t; a cloth winder w is attached to a lever w' the outer end of which lever embraces the gudgeons of the cloth beam and its other end is operated on by a cam on the cam shaft G'. This arrangement is shown most distinctly in Fig. 9 where J, J, shows the double cam that acts on the lever w'. The cams J are outside of the cams T, that operates the stops of the knee operators. The lever U, belonging to the cam T is not shown in Fig. 9. A plank x (Fig. 3) is made to press upon the cloth beam; this plank has a pin in each of its ends that enters into a slot or groove y in the lever w' in which the plank x may slide back and forth; it may be drawn against the cloth beam by means of a weight and cord z z.

Having thus fully described the improvements made by me in the power looms, and the manner in which they are combined therewith, what I claim therein as new and desire to secure by Letters Patent is—

1. The manner in which I employ an independent stationary rod c' c' for the picker driver w to slide upon, there being picker rods to each picker as usual.

2. I claim the manner of combining and arranging the respective parts connected with the protection rod, so as to allow the lay to give a second stroke to each thread of filling; said parts consisting principally of the weight e on the end of the lever e'' (Fig. 6 of the accompanying drawings) said lever acting upon the cord h that draws upon a finger j attached to the protection rod whereby the weight is made to overpower the action of the protection spring and the lay may consequently be made to beat up without the intervention of the shuttle excepting when the weight is lifted by the treadles which lifting takes place just before a shuttle is thrown, and this combination I claim whether the respective parts be arranged precisely as herein set forth or in any other that is substantially the same in its operation and result.

WILLIAM SHERWOOD.

Witnesses:
CHAS. H. RANDALL,
SMITH B. KEELER.