No. 698,279. Patented Apr. 22, 1902.

L. H. HARTLEY, T. H. NAMACK & J. NEWHALL.

PILE WIRE MOTION FOR LOOMS.

(Application filed Mar. 11, 1901.)

(No Model.) 2 Sheets—Sheet I.

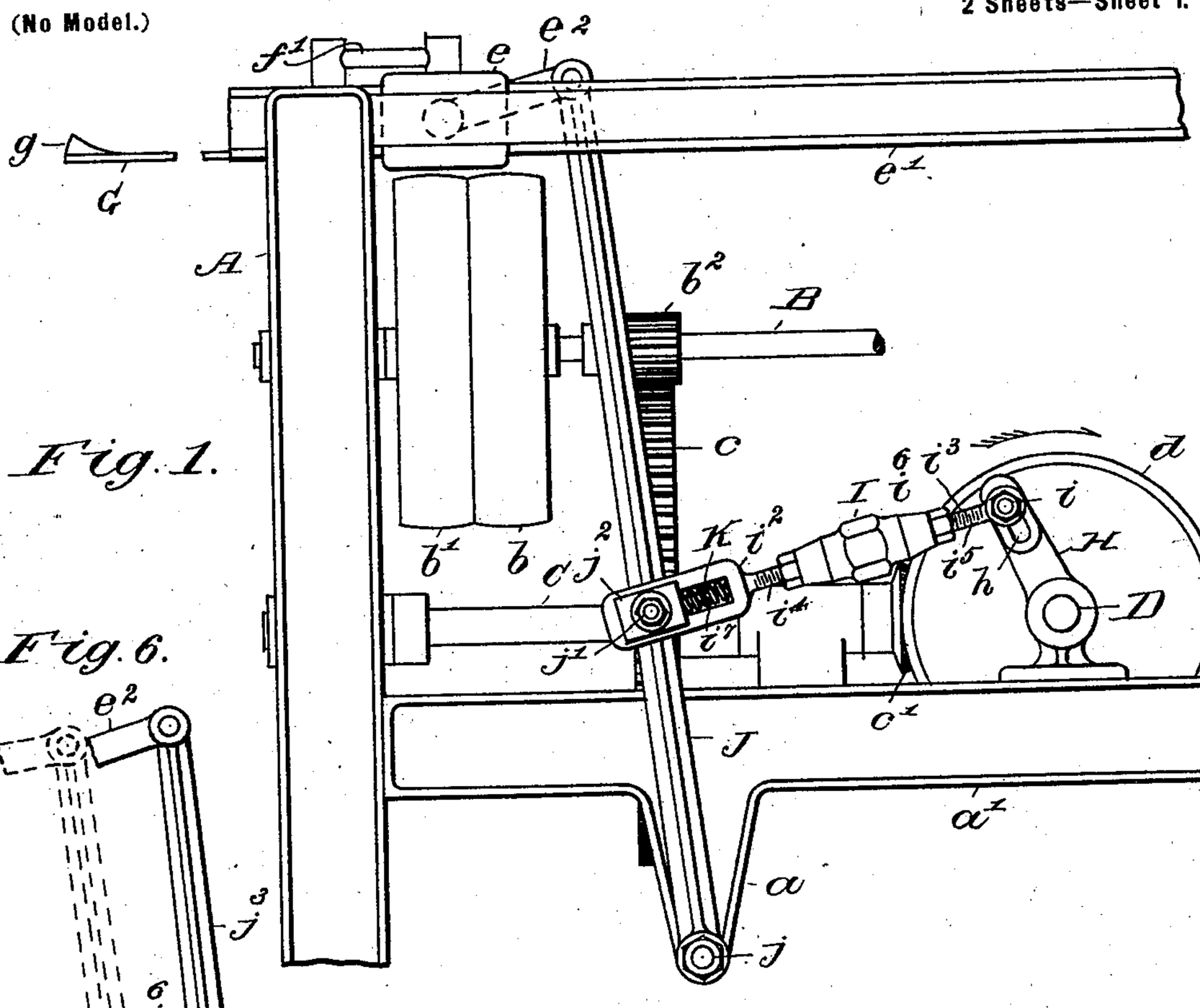


Fig. 6.

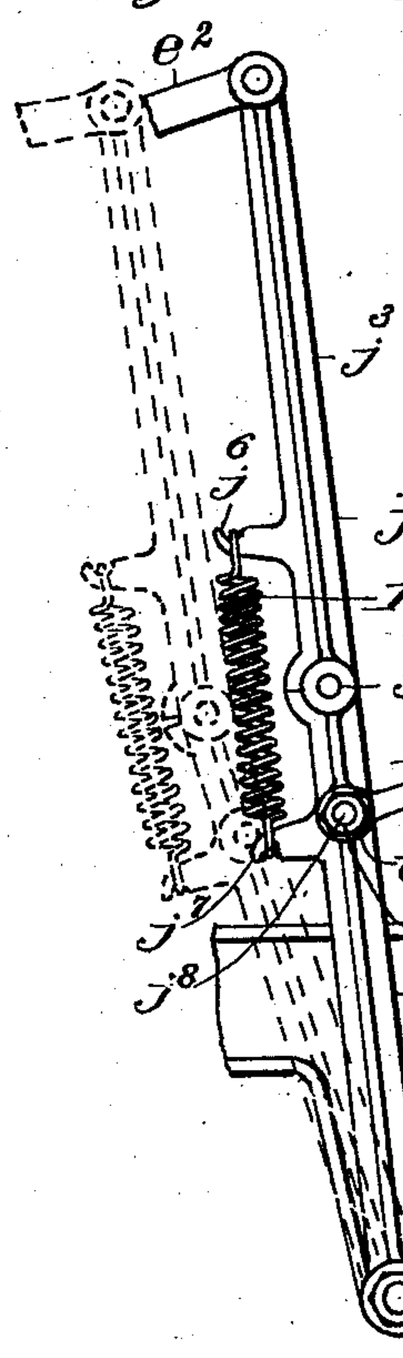
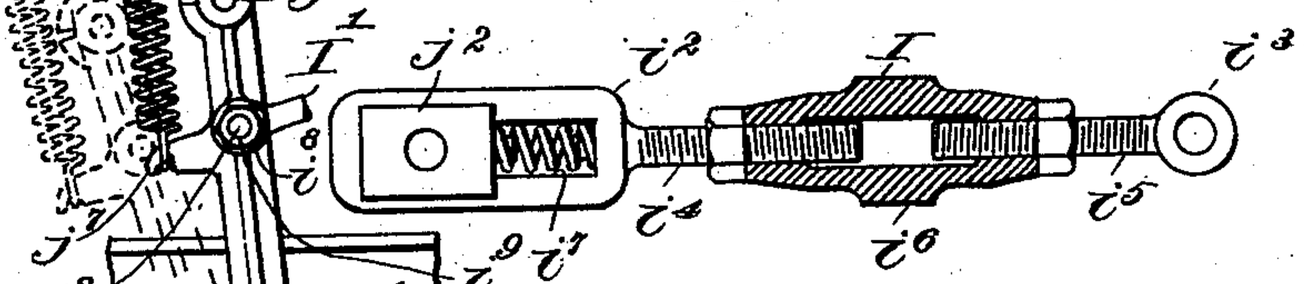


Fig. 2.



WITNESSES.

Kirkley Hyde.

Susie M. Hannaford

INVENTORS,

Leonard H. Hartley,

Thomas H. Namack &

John Newhall,

By Albert M. Moore,

Their ATTORNEY

No. 698,279. Patented Apr. 22, 1902.

L. H. HARTLEY, T. H. NAMACK & J. NEWHALL.

PILE WIRE MOTION FOR LOOMS.

(Application filed Mar. 11, 1901.)

(No Model.) 2 Sheets—Sheet 2.

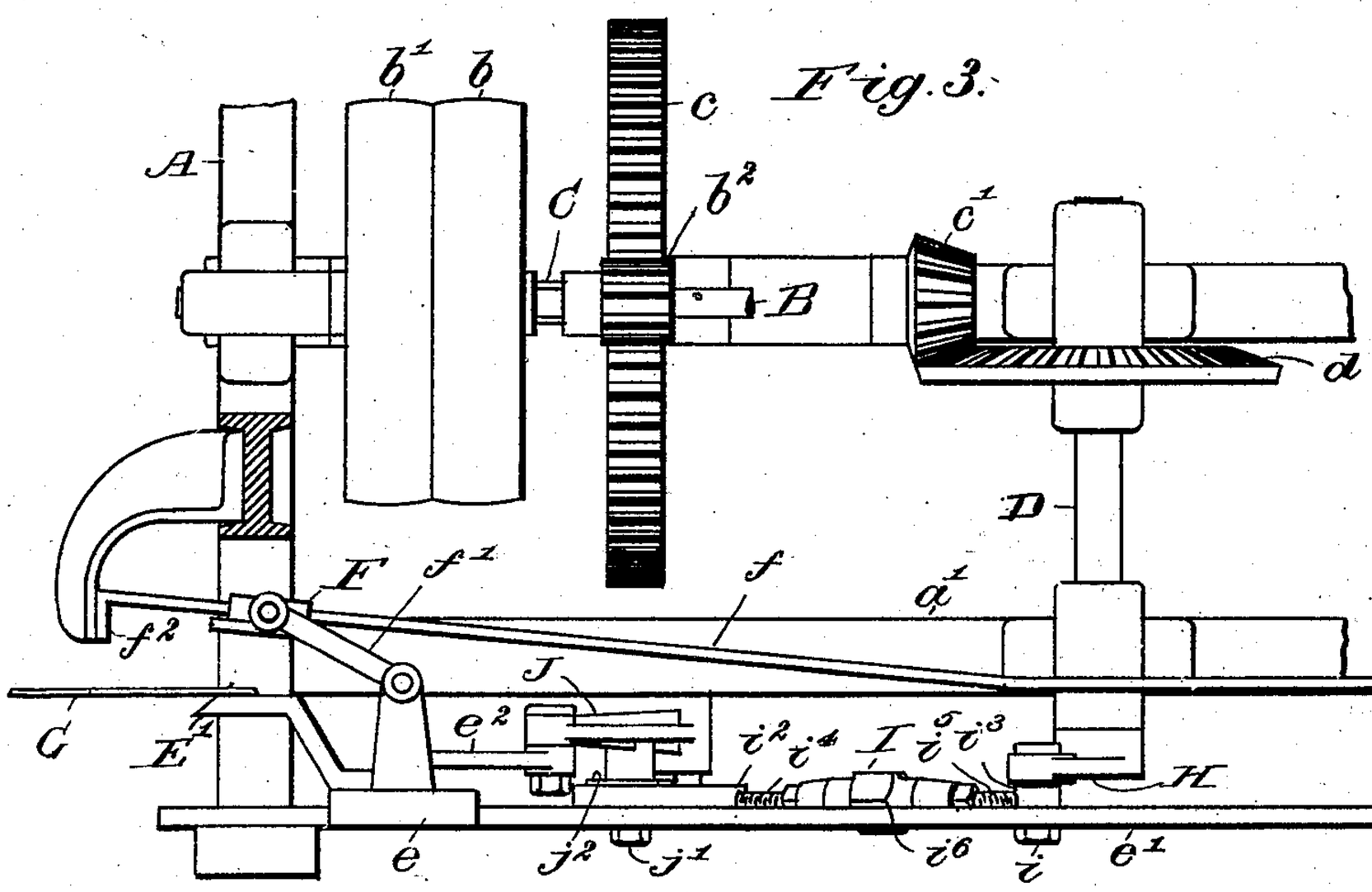


Fig. 3.

Fig. 4.

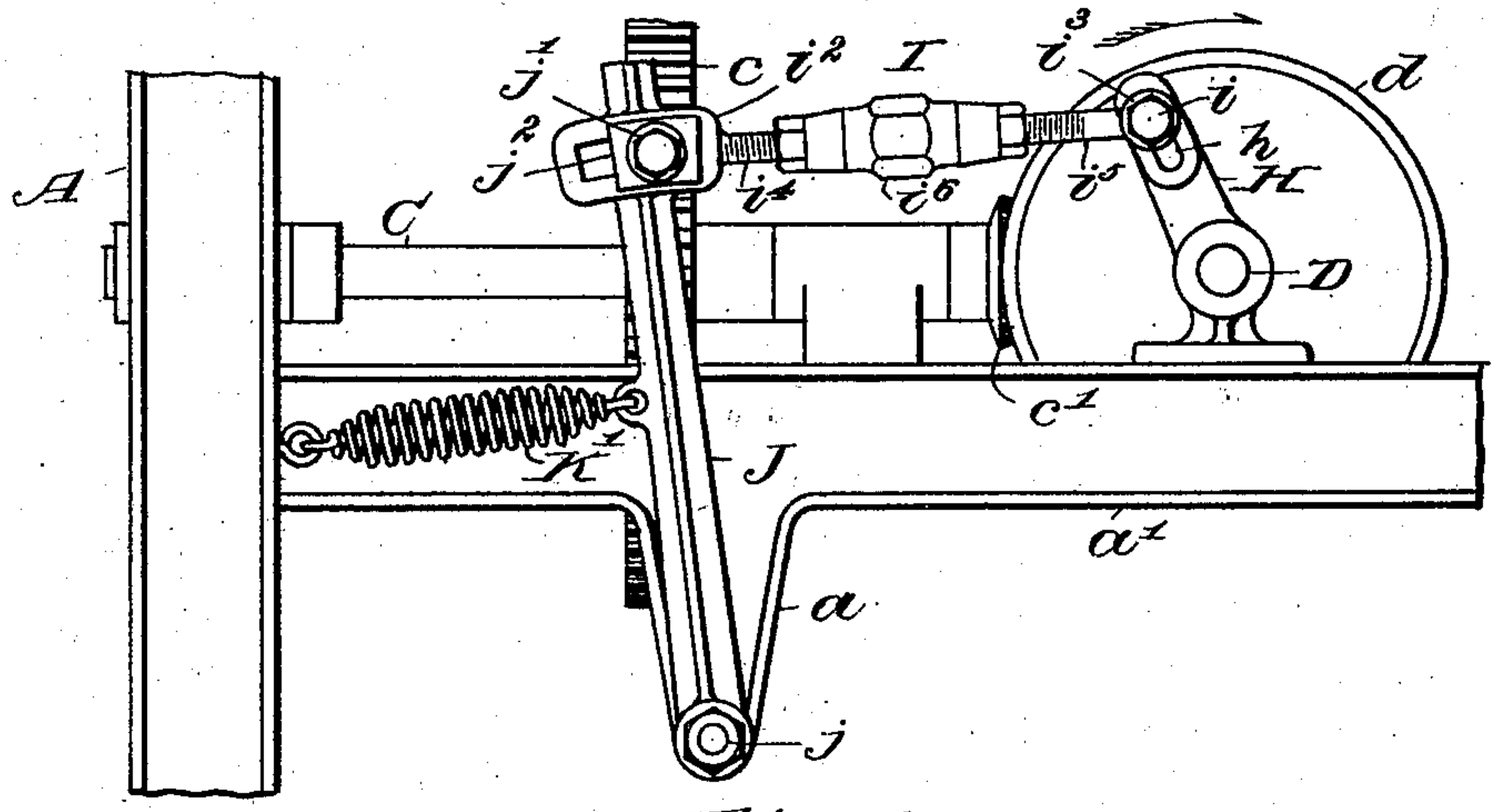
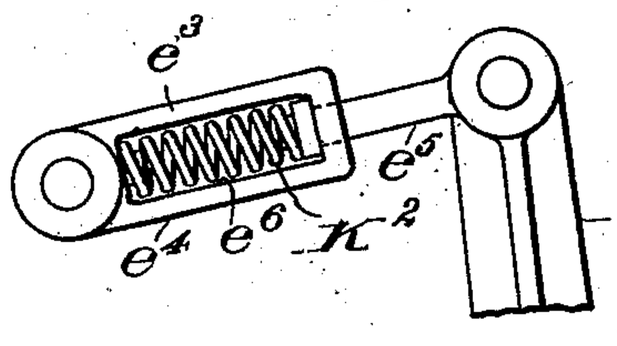


Fig. 5.



WITNESSES.

Kirkley Hyde.

Susie M. Hannaford

INVENTORS.

Leonard H. Hartley,
Thomas H. Namack &
John Newhall,
By Albert M. Moore,
Their ATTORNEY.

UNITED STATES PATENT OFFICE.

LEONARD H. HARTLEY, THOMAS H. NAMACK, AND JOHN NEWHALL, OF LOWELL, MASSACHUSETTS.

PILE-WIRE MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 698,279, dated April 22, 1902.

Application filed March 11, 1901. Serial No. 50,567. (No model.)

To all whom it may concern:

Be it known that we, LEONARD H. HARTLEY, THOMAS H. NAMACK, and JOHN NEWHALL, citizens of the United States, residing in Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Pile-Wire Motions for Looms, of which the following is a specification.

Our invention relates to pile-wire motions for looms, and comprises a yielding connection between the wire-motion shaft and the pile-wire introducing and withdrawing devices.

The objects of this invention are to simplify and cheapen the pile-wire motion, to reduce the number and weight of the parts of the same, to lessen the power required to drive the same, and to decrease the liability of damage and breakage of parts of the same and of the shuttle and lay.

It is customary to operate the wire-motion lever by a grooved cam fast on the wire-motion shaft and an intermediate lever pivoted at its upper end on the front of the loom side and having a stud carrying an antifriction-roll which enters the groove of said cam, the lower end of said intermediate lever being connected by a link to the lower end of the wire-motion lever, (which is a lever of the first order.) The upper end of the wire-motion lever is connected by a link to a slide which carries the wire-withdrawing hook, and this slide is connected by another link to the hopper-slide or wire-introducing slide, so that the oscillation of said wire-motion lever will cause the traverse of said slides. The slides are so guided that just before the end of their outward movement they meet, and the pile-wire withdrawn by the hook is transferred from said hook to the hopper-slide when the mechanism works properly, the hopper-slide being empty when moving outward or away from the work and carrying a wire when moving inward and these conditions being reversed in the hook, so that no wire will be carried in by the hopper-slide unless one is withdrawn by the hook and delivered to said hopper-slide. The groove in the cam above mentioned and the stud and roll which enter said groove soon become worn and cause a jerky movement of the slides, which frequently shakes the wire from the withdrawing-hook before said wire is pulled out of the fabric, causing a failure of the pile on the fabric and necessitating a pick-out.

This invention is applicable to the weaving of pile fabrics whether the pile is cut, as in Wilton carpets, cut velvet, velveteen, or plush, or left in loops, as in uncut velvet or Brussels and tapestry carpets.

In the accompanying drawings on two sheets, Figure 1 is a front elevation of such parts of a loom for weaving pile fabrics as are necessary to understanding our invention; Fig. 2, a front elevation of the link which connects the crank and wire-motion lever, the turnbuckle which connects the two members of said link being in central vertical section; Fig. 3, a plan of the driving-shaft, wire-motion shaft, and wire-motion embodying our invention; Fig. 4, similar to Fig. 1, but showing a modified form of our invention; Fig. 5, a front elevation of the upper end of the wire-motion lever and the link which connects it to the hook-slide, showing a modification of said link; Fig. 6, a front elevation of a modification of the wire-motion lever.

A, Figs. 1 to 3, is the frame of the loom; B, the driving-shaft, carrying a fast pulley b, a loose pulley b', and a pinion b^2, which engages a gear c, fast on the crank-shaft C; c', a beveled pinion which engages a beveled gear d, fast on the wire-motion shaft D; E′, the withdrawing-hook, fast on the slide E, which moves on a horizontal guide e', supported on the frame A; F, the hopper-slide, running on the guide f, also supported on the frame A; f', a link connecting the slides e F, these parts being all of the usual construction and operation, said guides e' f being in the same horizontal plane, but converging toward each other outwardly to enable the hopper-slide to come in contact with the hook and to take therefrom a pile-wire at the outer end of their traverse in the usual manner.

The pile-wire G is of any usual form and is shown with a knife g to cut the loops as the wire is withdrawn from the fabric; but said knife obviously may be omitted if the pile is not to be cut.

Instead of the heavy grooved cam-disk com-

monly secured to the wire-motion shaft D, we use a crank H, fast on said shaft, and we connect the outer portion of said crank by means of a link I to the wire-motion lever J, the pivot i at the outer end of said link being adjustable in a radial slot h in said crank in any usual manner to vary the throw of said crank and the amount of oscillation of said lever J. The link I is adjustable in length to vary the ends of the traverse of said lever, said link being formed in two parts i^2 i^3, having on their adjacent end portions, respectively, a right-hand screw i^4 and a left-hand screw i^5 to engage a turnbuckle i^6 in a well-known manner.

The lower end of the wire-motion lever J is fulcrumed at j on a hanger a, which is cast or otherwise secured on a part a' of the frame A, and the upper end of said lever is connected by a link e^2, preferably in the usual manner, to the hook-slide e. The lever J is connected to the link I by a stud j', projecting forward from said lever and passing through a block j^2, which slides in a longitudinal slot i^7 in the inner end of the link I. A spring (represented as a spiral or coiled wire spring K, Figs. 1 and 2) is compressed between the outer end of the block and the outer end of the slot i^7 and tends to keep said block j^2 at the inner end of said slot; but just before the crank H reaches its dead-center on the side toward the lever the hopper-slide F is stopped against the bent inner end f^2 of the guide f, Fig. 1, arresting the inward movement of the hook-slide e and wire-motion lever J, these parts remaining at rest until the crank has passed its dead-center for a distance, the spring K yielding to permit the inward motion of the link I after the wire-motion lever J has come to rest. While the slides e F and lever J are thus at rest the lay may be swung backward without danger of the shuttle-box striking the hopper-slide F, there being space enough between the shuttle-box and the reed to allow the said hopper-slide to pass between them. As the crank rises above its dead-center the spring expands until the block j^2 is at the inner end of the slot i^7 or end of the slot nearest the fabric, when the lever J and the slides e F are swung outward, the hopper-slide F in its outward movement passing in front of the shuttle-box.

In Fig. 4 the modification consists in substituting for the spring K in the slot i^7 a spring K′, connecting the wire-motion lever J with the frame A in an obvious manner, the pressure of the spring K, Figs. 1 and 2, and the pull of the spring K′, Fig. 4, serving the same purpose of keeping the hopper-slide F against the bent end f^2 of the guide f and preventing the vibration of the lever J when the block j^2 is out of contact with the inner end of the slot i^7.

In Fig. 5 is shown another modification. The link e^3, which serves the purpose of the link e^2 in connecting the upper end of the lever J with the slide e, is represented as formed in two parts e^4 e^5, the part e^4 being slotted at e^6 to receive a spring K^2, and the part e^5 being a rod movable longitudinally with reference to said part e^4 and having a head adapted to traverse in said slot to compress the spring K^2 when the slides e F are stopped, as above described, said spring K^2 allowing a dwell of said slides in the manner and for the purpose above described.

The parts not mentioned in Figs. 4 and 5 are or may be like the corresponding parts indicated by corresponding letters of reference in the first three figures.

In Fig. 6 the wire-motion lever J′ is made in two lengths j^3 j^4, connected by a rule-joint j^5, and said lengths are normally held in line with their ends abutting, as shown in full lines, by a spring represented as a helical wire spring K^3, stretched between projections j^6 j^7 on said lengths j^3 j^4, respectively; but when the slides are stopped at the inner end of their traverse, as above described, the joint j^5 allows the upper end of said lever J′ to stop while the upper end of the lower length continues to move, the lever bending at the joint, as shown in dotted lines. The link I′, which connects the lower length of the lever J′ to the crank, is like the link I, (shown in Fig. 1,) except that the inner end i^8 of the link I′ is like the outer end of the link I—that is, it is merely provided with a round opening i^9 to receive and turn on a stud j^8, which projects from said lever J′, and need not be provided with the longitudinal slot i^7. (Shown in Figs. 1 and 2.) The link I′ might also be used in Fig. 5.

We claim as our invention—

1. In a pile-wire motion for looms, the combination of the wire-motion shaft, the hopper-slide intermediate mechanism connecting said slide and shaft and a yielding device arranged between said slide and said shaft and adapted to permit the arresting of said slide without stopping said shaft.

2. In a pile-wire motion for looms, the combination of the wire-motion shaft, provided with a crank, a wire-motion lever, a link connecting said crank and said lever, the hopper-slide mediately operated by said lever, and a yielding device, arranged between said crank and said slide to permit the inward movement of said slide to be arrested before said crank has attained its greatest inward throw.

3. In a pile-wire motion for looms, the combination of the wire-motion shaft, provided with a crank, a wire-motion lever, a link, pivoted at one end to said crank and at the other end provided with a longitudinal slot, a block, arranged to slide in said slot, and to turn on a stud with which said lever is provided, a spring, normally to hold said block at the end of said slot farthest from said crank, the hopper-slide and connecting means between said hopper-slide and said lever.

4. In a pile-wire motion for looms, the combination of the wire-motion shaft, provided with a crank, a wire-motion lever, a link, pivoted at one end to said crank and at the other end provided with a longitudinal slot, a block, arranged to slide in said slot, a spring, arranged in said slot between said block and the end of said slot nearest said crank, a stud projecting from said lever and adapted to turn in a hole with which said block is provided, the hopper-slide and connecting means between said hopper-slide and said lever.

In testimony whereof we have affixed our signatures in presence of two witnesses.

LEONARD H. HARTLEY.
THOMAS H. NAMACK.
JOHN NEWHALL.

Witnesses:
ALBERT M. MOORE,
SUSIE M. HANNAFORD.