No. 709,447. Patented Sept. 16, 1902.

A. F. McCOLLUM.

LOOM FOR WEAVING PILE FABRICS.

(Application filed July 8, 1901.)

(No Model.) 5 Sheets—Sheet 1.

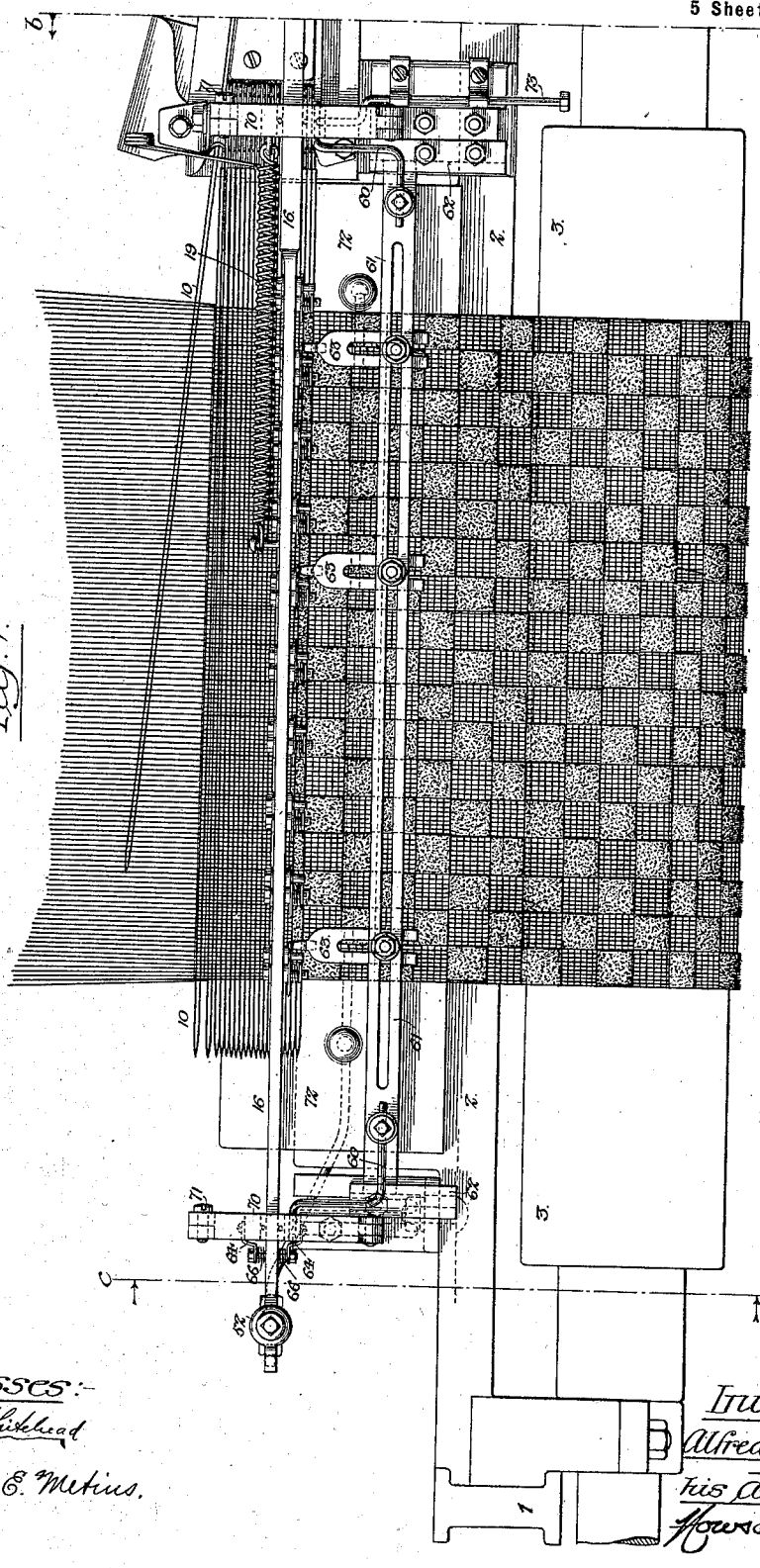


Fig. 1.

Witnesses:-
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Herman E. Metius.

Inventor:
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by
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 5 Sheets—Sheet 2.

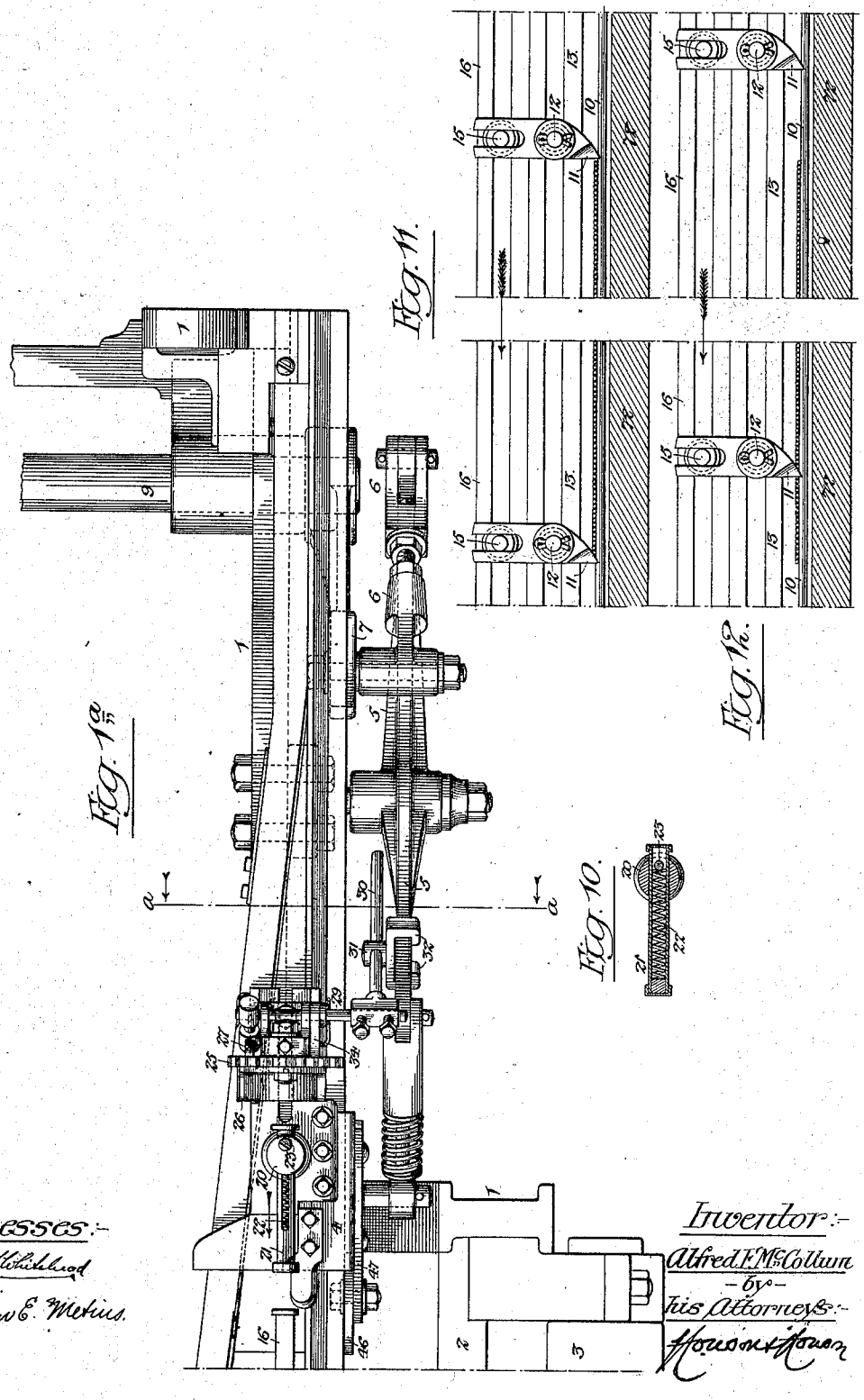


FIG. 1a.

FIG. 11.

FIG. 12.

FIG. 10.

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(No Model.) 5 Sheets—Sheet 3.

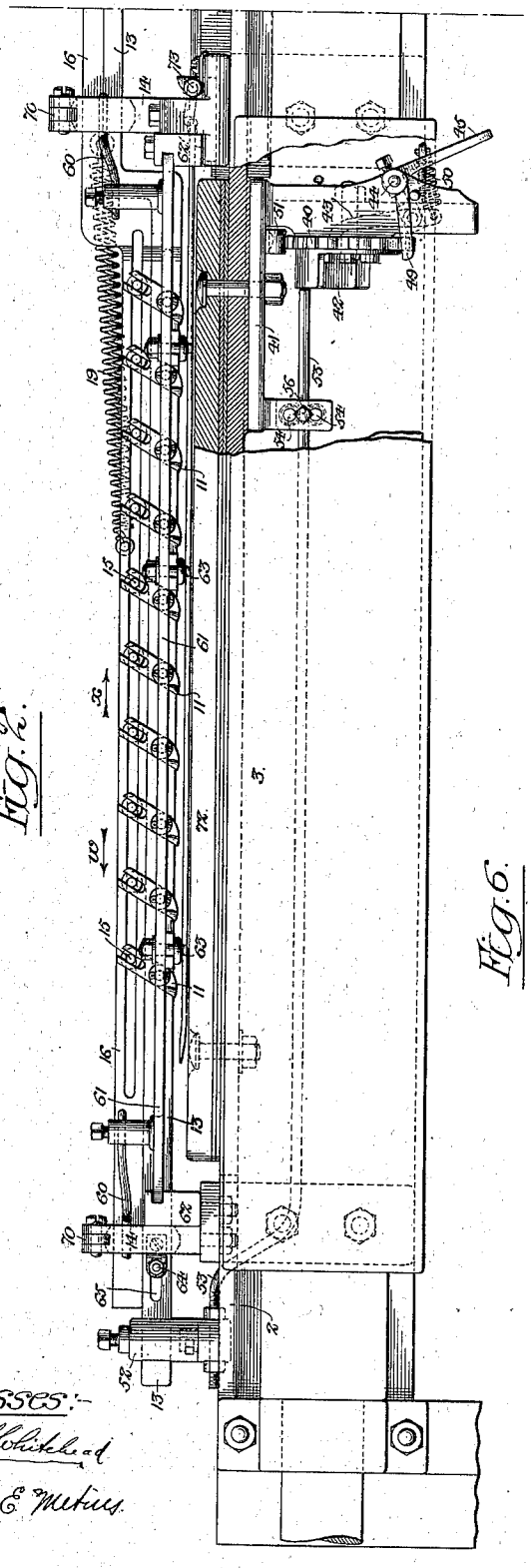


Fig. 2.

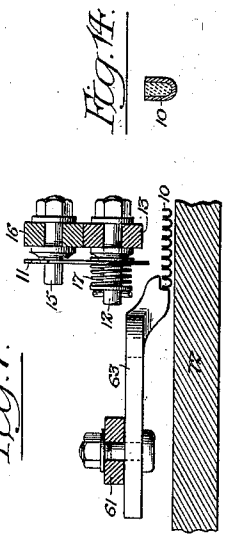


Fig. 7.

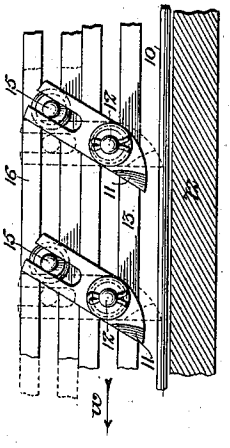


Fig. 6.

Fig. 14.



Fig. 13.

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No. 709,447. Patented Sept. 16, 1902.

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LOOM FOR WEAVING PILE FABRICS.

(Application filed July 8, 1901.)

(No Model.) 5 Sheets—Sheet 4.

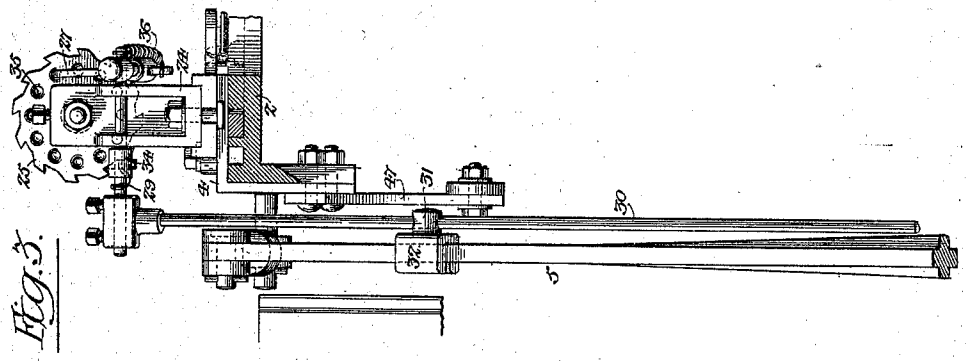


Fig. 3.

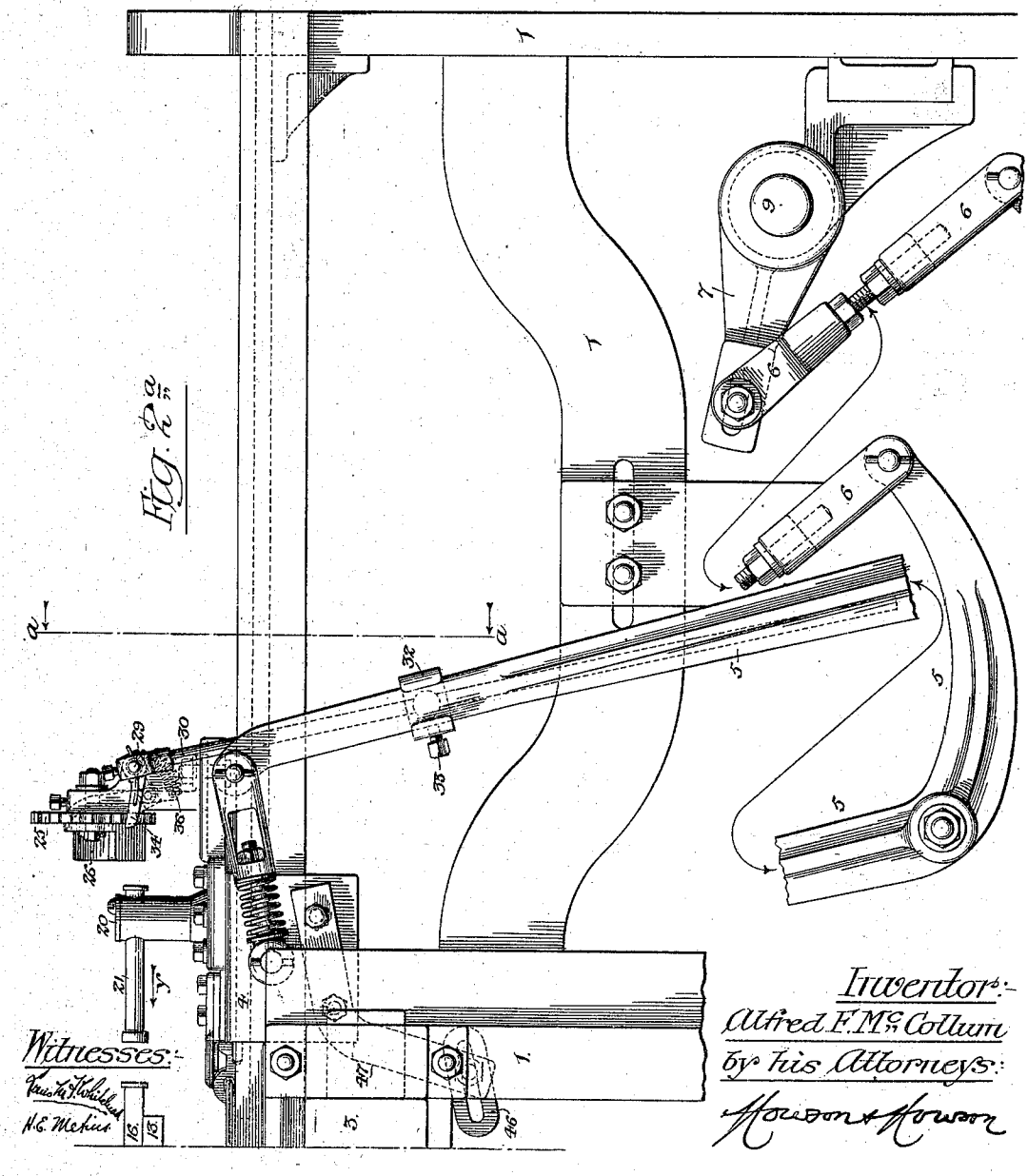


Fig. 2a.

Witnesses:
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No. 709,447. Patented Sept. 16, 1902.

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LOOM FOR WEAVING PILE FABRICS.

(Application filed July 8, 1901.)

(No Model.) 5 Sheets—Sheet 5.

Fig. 9.

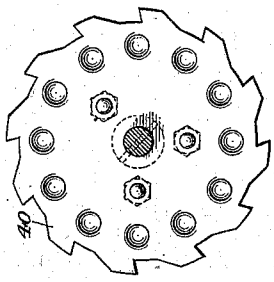


Fig. 4.

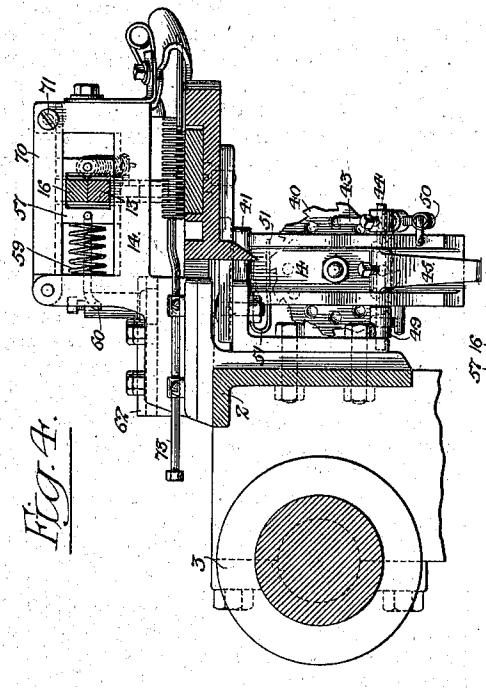


Fig. 5.

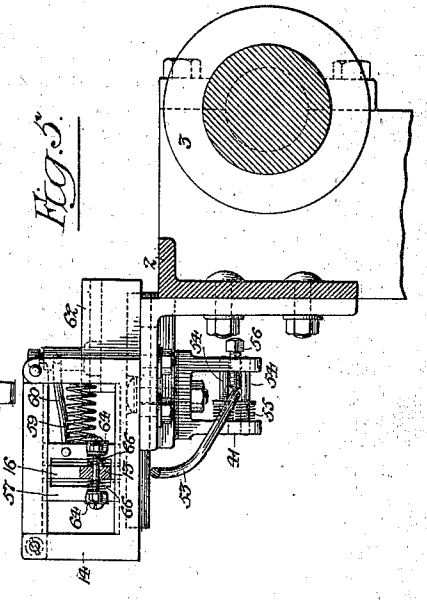
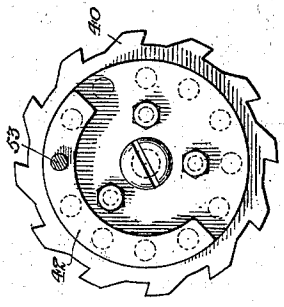


Fig. 8.



Witnesses:—
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Norman C. Mathius.

Inventor:—
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UNITED STATES PATENT OFFICE.

ALFRED F. McCOLLUM, OF ESPY, PENNSYLVANIA, ASSIGNOR OF THREE-FIFTHS TO JAMES MAGEE, 2D, OF BLOOMSBURG, PENNSYLVANIA.

LOOM FOR WEAVING PILE FABRICS.

SPECIFICATION forming part of Letters Patent No. 709,447, dated September 16, 1902.

Application filed July 8, 1901. Serial No. 67,525. (No model.)

To all whom it may concern:

Be it known that I, ALFRED F. McCOLLUM, a citizen of the United States, and a resident of Espy, Columbia county, Pennsylvania, have invented certain Improvements in Looms for Weaving Pile Fabrics, of which the following is a specification.

The object of this invention is to provide a loom for weaving pile fabrics with pile-loop-cutting devices of such character that the pile-loops when cut will present a pile of substantially uniform height. Hence there is not that loss of material which is experienced in shearing an unevenly-cut pile down to a level, the cutting devices furthermore being such that certain loops of a transverse row of loops formed over a pile-wire may be cut and the remaining loops of the row may be permitted to remain uncut, whereby the fabric produced may have cut-pile figures upon an uncut-pile ground, or vice versa. By the use of certain patterning devices in connection with the cutting mechanism the configuration of the cut portions of the pile may be varied as desired.

In the accompanying drawings, Figures 1 and 1^a represent in top or plan view sufficient of the mechanism of a pile-loom to illustrate the present invention. Figs. 2 and 2^a represent a front elevation of the same, partly broken away. Fig. 3 is a section on the line *a a*, Figs. 1^a and 2^a. Fig. 4 is a section on the line *b b*, Fig. 1. Fig. 5 is a section on the line *c c*, Fig. 1; and Figs. 6 to 14 are views, mostly on a larger scale, of parts of the mechanism.

Part of the frame of the loom is illustrated at 1 and part of the breast-beam at 2, said beam having bearings for the shaft of the breast-roller 3, around which the woven fabric passes, and the beam also serving as a guide for the slide 4, whereby the pile-wires are withdrawn from the fabric and reintroduced into the open shed of warp-threads, said slide being reciprocated by a lever 5, which is connected by a two-part link 6 to an arm 7 on the rock-shaft 9. These parts are similar to those of an ordinary pile-loom, and no further description of the pile-wire-operating mechanism will be necessary, as my invention has no special reference thereto, but consists in certain devices supplementary to the pile-wire-controlling mechanism and intended to effect the cutting of the pile-loops formed over the pile-wires.

The pile-wires 10 are U-shaped in cross-section, as shown in Fig. 7, and the pile-loops cross the open tops of the pile-wires, so that they can be readily cut by means of a knife, having a portion projected down into the hollow wire. If desired, however, the pile-wires may be filled with wood or composition, against which the sharp edge of a knife can be pressed without being dulled. Such a pile-wire is illustrated in Fig. 14.

A number of cutting-knives 11 are employed, ten of these knives being shown in the present instance, said knives being mounted upon studs 12, having stems adapted to a longitudinal slot in a bar 13, mounted so as to be free to slide longitudinally to a limited extent in bearings 14, suitably secured to the breast-beam 2 of the loom. By thus mounting the knives they can be adjusted toward or from each other upon the bar 13 in accordance with the requirements of the pattern of cut pile which is to be produced. In the present instance the mechanism is designed for producing a checker-board pattern having alternate squares of cut and uncut loops, and the knives are therefore adjusted equidistantly upon the bar. The upper portion of each knife-blade is slotted for the reception of a stud 15, projecting from a bar 16, located above the bar 13 and, like it, guided in the bearings 14, the bar 16 being slotted longitudinally and the studs 15 having stems passing through said slot and secured to the bar in the same manner as the stems of the studs 12 are secured to the bar 13, whereby the studs 15 can be adjusted on their bar 16 to accord with the position of the knives upon the bar 13. A spring 17, interposed between each knife and a washer at the outer end of the stud 12, serves to keep said knife pressed snugly against a flange or collar at the inner end of said stud 12, and yet permits the lower or cutting edge of the knife to follow any departure from a true alinement of the grooved pile-wire, so as to insure the proper cutting of the pile-loops stretched across the top of said wire, and also permits lateral deflection

of a knife if it chances to strike a knot or other obstruction in the yarn, such as would cause lateral deflection. The bar 16 is acted upon by a coiled spring 19, which tends to move it in the direction of the arrow *x*, Fig. 2, thereby swinging upward the lower or cutting ends of the knives 11, so that they will be withdrawn from the grooved pile-wires and carried above the tops of the pile-loops formed thereon. When, however, the bar 16 is moved in the direction of the arrow *w*, Fig. 2, the cutting ends of the knives will be depressed and caused to enter the hollow pile-wires, as shown by dotted lines in Fig. 6, so that when the bar 13 is moved forward or in the direction of the arrow *w*, Fig. 6, the loops formed over the hollow pile-wire will be cut by the knives as long as said forward movement of the bar 13 continues. Forward movement of the bars 13 and 16 is effected by pattern mechanism (shown in Figs. 1ª, 2ª, and 3) and which is as follows: On the pile-wire-controlling slide 4 is a vertical stud 20, in the upper portion of which is longitudinally guided a bolt 21, hollow throughout the greater portion of its length for the reception of a coiled spring 22 and slotted for the passage of a screw or pin 23 at the top of the stud 20, the spring 22 bearing at one end against the shoulder in the bolt 21 and at the opposite end against said pin 23, so that it tends to project the bolt in the direction of the arrow *y*, Fig. 2ª, but permits it to be moved in the opposite direction when sufficient pressure is exerted thereon. A vertically-projecting bracket 24 on the slide 4 carries a stud, pin, or bolt, upon which is mounted so as to be free to turn a ratchet-wheel 25, and to the face of the latter is secured a pattern-cam 26, and as the slide 4 is reciprocated intermittent movement of partial rotation is imparted to the ratchet-wheel 25 by means of a pawl 27, pivoted to an arm on a rock-shaft 29, mounted in bearings on the bracket 24 and provided at its outer end with a depending rod 30, which passes through an opening in a stud 31, projecting from a clip 32, which is mounted upon the lever 5, so as to be adjustable from and toward the fulcrum of the same, a set-screw 33 securing it in position upon the lever after adjustment. The pawl 27 is acted upon by a spring 36, (shown by dotted lines in Fig. 2ª,) which tends to force the upper end of the pawl into engagement with recesses 35, formed in the back of the ratchet-wheel 25, there being one of these recesses for each tooth of the wheel. As the lever 5 swings the shaft 29 will be caused to rock in its bearings and the pawl 27 will act upon the ratchet-wheel 25, so as to move the same to the extent of one tooth for each movement of the lever 5, overrunning of the wheel being prevented by the engagement of a detent-lever 34 with the teeth of the wheel. The detent-lever is also carried by the rock-shaft 29, but can have a slight movement independently thereof, being retained in its normal position by a suitable spring. The bars 13 and 16 have vertically-offset portions, as shown in Fig. 2, forming engaging shoulders, and when these shoulders are in engagement, as shown in Fig. 2, the end of the upper bar 16 projects slightly beyond the end of the bar 13, as shown in Fig. 2ª. The upper bar 16 is in line with the bolt 21. Hence when the slide 4 is moved forwardly or in the direction of the arrow *y*, Fig. 2ª, the first effect of this movement will be to bring the end of the bolt 21 into contact with the end of the bar 16, and as the spring 19, which holds said bar 16 in position, is stronger than the spring 22, which acts upon the bolt 21, the latter will yield and be moved in a direction the reverse of that indicated by the arrow *y*, this movement continuing until the opposite end of the bolt comes into contact with the pattern-cam 26, whereupon such rearward movement of the bolt will be arrested and the forward movement of the slide 4 will be transmitted to the bar 16, this bar alone being moved until its opposite end comes into contact with a post or stud 52 upon the bar 13, whereupon both bars will be moved together. As a result of this the knives 11 will be first moved from the position shown by full lines to that shown by dotted lines in Fig. 6 and then will be moved forwardly across the fabric—that is to say, the points of the knives will first be thrust downward through the pile-loops and into the grooved pile-wire, which is in line with the knives, said knives being then moved forwardly, so as to cut the pile-loops in advance of the same. The cutter-bar 13 is pulled across the woven web instead of being pushed. Hence there is less tendency to deflection of the bar due to vibration which might result from a thrust on the bar, the adjustment of the post or stud 52 governing the extent of movement of the bar 16 independently of the bar 13, and hence governing the swing of the knives 11, whereby they can be adapted to coöperate with deep or shallow pile-wires and can have any desired depth of cut. The cutting operation ceases when the pile-wire-controlling slide 4 reaches the limit of its inward movement. Hence the length of cut made by each knife depends upon the position of the slide 4 in respect to the inner end of its stroke when the knife is moved into cutting position, and this in turn depends upon the amount of lost motion between the outer end of the bolt 21 and the face of the pattern-cam 26 when the inner end of said bolt is in contact with the end of the arm 16 and the end of the latter is in contact with the post or stud 52 on the arm 13. Thus if the bars 13 and 16 always occupy the same position of rest or limit of motion toward the right and the face of the pattern-cam is always in the same plane the cut portions of the pile-loops would form longitudinal stripes of a width depending upon the amount of lost motion between the outer end of the bolt 21 and the face of the cam, and if the latter had its face in different planes the stripes would have cor-

responding outlines. If the amount of travel imparted to the cutter-bar 13 equaled or exceeded the distance between successive knives, the entire row of pile-loops would be cut; but if such travel was less than the distance between the knives the cut stripes would alternate with uncut stripes of a width equal to such difference. In order to form blocks or squares, as in the pattern shown in the drawings, however, it is necessary to change the position of rest of the knives periodically in respect to the fabric, so that squares of cut pile will alternate with squares of uncut pile longitudinally as well as laterally. For this reason I use pattern mechanism substantially similar to that above described for governing the position of rest of the bars 13 and 16. Said mechanism comprises a ratchet-wheel 40, hung to a stud carried by a bracket 41 beneath the breast-beam and provided with a pattern-cam 42, this ratchet-wheel being operated by a pawl 43, pivoted to an arm on a rock-shaft 44, which has an arm 45, adapted to be struck by an adjustable tappet 46, carried by an arm 47, depending from the pile-wire-operating slide 4, as shown in Fig. 2ª and in Fig. 3, the pawl 43 being acted upon by a spring 50, so as to cause it to engage with recesses in the back of the ratchet-wheel 40, and a detent 49 on the rock-shaft 44, acting on the teeth of the ratchet-wheel to prevent overrunning of the same. A spring 51 bears upon the top of the ratchet-wheel and prevents any accidental movement of the same during the time that the pawl and detent are being retracted. A similar spring may be used in connection with the ratchet-wheel 25. The post 52 at the left-hand end of the knife-carrying bar 13 has a depending portion, to which is connected one end of a rod 53, the other end of which is suitably guided between pins 54, carried by a depending portion of the bracket 41, whereby it is adapted to coöperate with the pattern-cam 42 to govern or determine the extent of movement toward the right, which the bars 13 and 16 are permitted to have under the pull of the spring 19. Supposing that the pattern-cams 26 and 42 are so adjusted that the high portion of the cam 26 will act upon the bolt 21 at the same time that the high portion of the cam 42 is acting upon the rod 53, there will always be the same amount of lost motion between the outer end of the bolt 21 and the cam 26, supposing that the difference between the high and low portions of each cam is the same; but when the high portions of the cams are in action the knife-carrying bar 13 will bear a different relation to the fabric from that borne by it when the lower portions of the cams are in operation. Thus in Fig. 11 the right-hand knife of the series on the movement of the knife-carrying bar to the left will cut the loops at and near the right-hand edge of the fabric, while the left-hand knife of the series will be beyond the left-hand edge of the fabric and will therefore do no cutting. When, however, the lower portions of the cams 26 and 42 come into position, the knife-carrying bar will be shifted so that the right-hand knife of the series will be beyond the right-hand edge of the fabric and the left-hand knife of the series will cut the loops at and near the left-hand end of the fabric, as shown in Fig. 12, and the intervening knives will be likewise shifted, so that supposing the fabric to be divided into a series of longitudinal strips the loops of those strips which were before cut will now be uncut and the loops of those strips which were before uncut will now be cut. As each of the pile-loops is cut in the center, it follows that the resulting pile will be of uniform height. Hence there is little or no loss due to shearing, whereas in the case of pile cut by knives on the pile-wires, as usual, this percentage of loss is quite heavy. Moreover, I find in practice that the knives which I employ have to be sharpened much less frequently than the ordinary pile-wire knives.

In order that the end of the stop-rod 53 may be adjusted laterally in respect to the pattern-cam 42, the guide-rods 54 for said stop-rod 53 have collars acted upon by coiled springs 55 and tend to thrust said guide-rod against the adjusting-screw 56, carried by the bracket 41, as shown in Fig. 5.

In order that the cutting-knives may be held in proper alinement with the grooved pile-wire, in connection with which they are intended to act, I employ the foremost pile-wire of the series woven into the fabric as a guide for determining the position of the knife-carrying bar 13, this result being effected in the following manner: The bars 13 and 16 are guided at each end in a slide 57, which is free to move laterally in the guide 14 and is acted upon by a spring 59, tending to push it inwardly, so as to move the knife-carrying bar backwardly over the series of inserted pile-wires. Each of the slides 57 is, however, connected by a bent wire 60 to a slotted bar 61, guided horizontally at each end in a slotted block 62 on the fixed frame, and this bar carries a series of slotted fingers 63, each of the end fingers of the series having a depending forward portion notched, as shown in Fig. 7, for engagement with the foremost pile-wire of the series of wires which have been woven into the fabric. As these notched ends of the fingers are by the action of the springs 59 pressed firmly into contact with said pile-wire they govern the position of the knife-carrying bar in respect to the series of inserted pile-wires, whereby the knives may be caused to coöperate with any desired one of said pile-wires, depending upon the adjustment of the fingers 63 longitudinally in respect to the bar 61. Thus in the present instance the knives operate in connection with the third wire of the set, as shown in Fig. 7. The intermediate fingers 63 do not come into contact with the side of the pile-

wire, but simply overlap the same, so as to prevent it from rising. The vertical guides 14 have hinged top bars 70, normally held in position by pins or bolts 71, so that the bars 13 and 16 can be readily inserted into and removed from their guides by simply releasing and throwing back these hinged bars. The lower end of the depending portion of the stud 52 is swiveled, as shown in Fig. 13, so that as soon as the foremost pile-wire has been withdrawn sufficiently to clear the left-hand finger 63 the left-hand end of the knife-bar 13 can be moved forwardly under the action of its spring 59 and the right-hand finger 63 will be relieved from pressure due to this spring, thereby reducing wear upon both the finger and pile-wire, which would result if both springs 59 acted constantly upon said finger.

Projecting from both the front and rear sides of each of the slides 59, in which the bars 13 and 16 are guided, are plates 64, which carry a pin or bolt passing through a slot 65 in the bar 13, and between each of these plates and the adjoining side of the bar is interposed a coiled spring 66, (see Fig. 5,) these springs exercising a certain frictional retarding effect upon the bar, so that when the spring 19 begins to move the bar 16 to the right the movement of the bar 13 will be retarded until the knives have been raised to inoperative position and the shoulders of the two bars formed by the vertically-offset portions of the same have come into contact with each other, as shown in Fig. 2, whereupon both bars will be moved together.

Projecting inwardly from the breast-beam 2 is a table or plate 72, which extends under that portion of the web into which the pile-wires are being inserted and serves to support said pile-wires and prevent deflection of the same and of the woven web under the action of the cutting-knives, thereby insuring the proper cutting of all of the loops of pile-thread which lie in the path of either of the knives.

In removing defective picks from a pile fabric it is necessary to hold the heads of the pile-wires back out of the path of the catch on the slide 4, so as to prevent the withdrawal of these wires as the loom is run back. As the guide-frame 14 prevents access to the pile-wire heads in the usual way, I mount in the guides on the breast-beam a push-rod 73, which bears upon the heads of the wires and provides a ready means of moving them rearwardly.

Although I prefer to operate the pattern-cam ratchets by the pile-wire-controlling slide, such operation is not essential to the proper carrying out of my invention, as such pattern-cam mechanism may be operated from any other available moving portion of the loom, if desired, and but one set of cam mechanism need be employed if a striped pattern instead of a block pattern is desired, either set of cam mechanism being available for use in this case.

In cutting stripes or cutting all of the loops where variations in the travel of the knife-bar are not required stops fixed when in action but adjustable for exactitude may take the place of the movable pattern-cams, and where it is desired to employ a single knife traveling completely across the fabric instead of a plurality of knives with correspondingly less extent of travel said knife may be mounted on a slide guided on a transverse bar or rail instead of upon a bar guided on the frame, as shown in the drawings.

Modifications of mechanical detail within the scope of my invention will suggest themselves to those skilled in the art. Hence I do not wish to be understood as limiting myself to the particular mechanical devices which I have shown for accomplishing the movements of different parts so long as the essential features of my invention as set forth in the broader of the subjoined claims are attained, and although I have shown and described my invention as employed in connection with a particular form of loom for weaving pile fabrics it is equally applicable to other forms of such looms.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric, and a knife pivoted to said carrier and movable on its pivot so as to engage with or be disengaged from the pile-loops, substantially as specified.

2. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric and movable across the same, and a knife pivoted to said carrier and movable on its pivot so as to engage with or be disengaged from the pile-loops, substantially as specified.

3. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, with a plurality of knives mounted upon said carrier, and each adapted to cut a portion of a row of pile-loops, whereby the movement of the knife-carrier is less than the width of the fabric, substantially as specified.

4. In pile-cutting mechanism for looms, the combination of a grooved pile-wire, a knife-carrier mounted above and movable across the fabric, and a plurality of knives mounted upon said carrier and having cutting portions movable into and out of the groove of the pile-wire, substantially as specified.

5. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, with a plurality of knives mounted on said carrier, and movable into and out of engagement with the pile-loops, substantially as specified.

6. In pile-cutting mechanism for looms, the

combination of a grooved pile-wire, a knife-carrier mounted above the fabric and a cutting-knife pivoted to said carrier so that its cutting portion may be swung into and out of the groove of the pile-wire, substantially as specified.

7. In pile-cutting mechanism for looms, the combination of a grooved pile-wire, a knife-carrier mounted above the fabric and movable across the same, and a cutting-knife pivoted to said carrier so that its cutting portion can be swung into or out of the groove of the pile-wire, substantially as specified.

8. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric, a cutting-knife mounted upon said carrier so as to be moved into and out of cutting relation with the pile-loops, and a bar movable in respect to the knife-carrier for operating said knife, substantially as specified.

9. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric and movable across the same, a knife mounted on said carrier and movable into and out of cutting relation with the pile-loops, and a bar movable in respect to the knife-carrier and serving to move the cutting-knife into and out of cutting position, substantially as specified.

10. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, one or more cutting-knives mounted upon said carrier, and mechanism whereby the movement of the carrier in both directions is effected by a pulling action, substantially as specified.

11. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric and movable across the same, a knife mounted on said carrier and movable into and out of cutting relation with the pile-loops, and pattern mechanism for governing the movement of the knife-carrier across the fabric, substantially as specified.

12. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric and having a knife movable into and out of cutting relation with the pile-loops, a bar movable in relation to the knife-carrier and serving to move the cutting-knife into and out of cutting position, and pattern mechanism governing the movement of said knife-carrier and controlling-bar, substantially as specified.

13. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, a knife mounted on said carrier so as to be movable into and out of cutting relation with the pile-loops, and two sets of pattern mechanism one governing the movement of the knife, in one direction and the other governing its movement in the opposite direction, substantially as specified.

14. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, a knife mounted on said bar so as to be movable into and out of cutting relation with the pile-loops, a bar movable in respect to the knife-carrier for throwing the cutting-knife into and out of cutting position, and two sets of pattern mechanism, one controlling the movement of the knife-carrier in one direction and also controlling the movement of the knife-operating bar, and the other controlling the movement of the knife-carrier in the opposite direction, substantially as specified.

15. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric and having a knife movable into and out of cutting relation with the pile-loops, a bar for moving said cutter into and out of cutting position, and pattern mechanism governing the extent of movement of said knife-operating bar, substantially as specified.

16. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric, a knife pivoted to the said carrier and movable into and out of cutting relation with the pile-loops, a bar engaging said knife and swinging it into and out of cutting position, and pattern mechanism for governing the extent of movement of said knife-operating bar, substantially as specified.

17. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric and having a knife movable into and out of cutting relation with the pile-loops, and adjustable means for arresting the downward movement of the knife when it has reached the proper cutting position, substantially as specified.

18. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric and movable across the same, a knife mounted on said carrier and movable into and out of cutting relation with the pile-loops, and adjustable means for arresting the downward movement of the knife when it has reached its proper cutting position, substantially as specified.

19. In pile-cutting mechanism for looms, the combination of the knife-carrier mounted above and movable across the fabric, a knife mounted on said carrier so as to be movable into and out of cutting relation with the pile-loops, a bar for actuating said knife, and an adjustable stop whereby the movement of the knife-operating bar after it has moved the knife into cutting position, will be transmitted to the knife-carrier, substantially as specified.

20. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric, a knife mounted on said carrier and movable into and out of cutting relation with the pile-loops, means for moving the knife into and out of cutting position, and means for adjusting the knife-carrier into different lateral relations in respect to the fabric, substantially as specified.

21. In pile-cutting mechanism for looms, the combination of the knife-carrier mounted above and movable across the fabric, and a knife mounted on said carrier, with means for laterally shifting the limits of movement of the knife-carrier whereby the knives may act successively upon different lateral portions of the fabric, substantially as specified.

22. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, a knife mounted on said carrier and movable into and out of cutting relation with the pile-loops, means for moving the knife into and out of cutting position, and provision for laterally shifting the limits of movement of the knife-carrier so as to cause the knives to act upon different lateral portions of the fabric, substantially as specified.

23. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric, a series of knives thereon movable into and out of cutting relation with the pile-loops, means for moving the knife-carrier rearwardly with yielding pressure, and a series of stop-fingers movable with the knife-carrier and adapted to contact with the foremost of the inserted pile-wires at different points in its length, substantially as specified.

24. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, a knife thereon movable into and out of cutting relation with the pile-loops, a bar movable in respect to the knife-carrier for moving said knife into and out of cutting position, means for moving said knife-operating bar, and a frictional retarding device acting upon the knife-carrier and serving to prevent movement of the same with the knife-operating bar until said friction has been overcome, substantially as specified.

25. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above and movable across the fabric, a knife carried by said bar and movable into and out of cutting relation with the pile-loops, a second bar movable in respect to the first for moving said knife into and out of cutting position, means for moving said second bar, a frictional retarding device for preventing movement of the knife-carrying bar with the knife-operating bar and engaging portions of the two bars for causing their joint movement, substantially as specified.

26. The combination in pile-cutting mechanism for looms, of a knife-carrier and an operating-slide therefor having a cam and a spring-actuated bolt interposed between said cam and the end of the knife, substantially as specified.

27. The combination in pile-cutting mechanism for looms, of a knife-carrier, a bar movable in respect thereto for adjusting the knives to operative or inoperative position, a slide carrying a pattern-cam and a spring-actuated bolt interposed between said cam and the knife-carrier and knife-actuating bar, substantially as specified.

28. The combination in pile-cutting mechanism for looms, of a knife-carrier with knives pivoted thereto and yielding means for holding said knives in lateral position in respect to the carrier, substantially as specified.

29. The combination in a loom for weaving pile fabrics, of the pile-wire inserting and withdrawing mechanism having as one of its elements a reciprocating slide, and pile-cutting devices mounted above the fabric and having as elements a laterally-movable knife-carrying bar and a laterally-movable knife-operating bar, said bars receiving their movement from the reciprocating slide of the pile-wire mechanism, substantially as specified.

30. The combination in a loom for weaving pile fabrics, of pile-wire inserting and withdrawing mechanism having as one of its elements a reciprocating slide, a knife-carrier mounted above the fabric, and a pattern-cam mounted on said pile-wire slide and serving to operate the knife-carrier, substantially as specified.

31. The combination in a loom for weaving pile fabrics, of the pile-wire mechanism having as one of its elements a reciprocating slide, a knife-carrier mounted above the fabric and having knives movable into and out of cutting position, a knife-operating bar movable in respect to the knife-carrier, and a pattern-cam mounted on the pile-wire slide and serving to operate the knife-carrier and knife-actuating bar, substantially as specified.

32. The combination in a loom for weaving pile fabrics, of a knife-carrier mounted above the fabric, pile-wire mechanism having as one of its elements a reciprocating slide, a pattern-cam mounted on said slide and serving to operate the knife-carrier and mechanism operated by the movement of the slide for imparting movement to said cam, substantially as specified.

33. The combination in a loom for weaving pile fabrics, of a knife-carrier mounted above the fabric, pile-wire mechanism having as one of its elements a reciprocating slide, pattern-cams for determining the movement of the knife-carrier in each direction, and mechanism operated by the movement of the reciprocating slide and serving to impart movement to said pattern-cams, substantially as specified.

34. The combination in pile-cutting mechanism for looms, of a knife-carrier mounted above the fabric, a pattern-cam for determining the movement of said knife-carrier in one direction, and yielding tension devices for moving the knife-carrying bar in the opposite direction, substantially as specified.

35. The combination in pile-cutting mechanism for looms, of a knife-carrier mounted above the fabric, a pattern-cam for determining the movement of said knife-carrier in one direction, and yielding tension devices for moving the knife-carrying bar in the opposite

direction, and a second pattern-cam for limiting such movement, substantially as specified.

36. In pile-cutting mechanism for looms, the combination of a knife-carrier mounted above the fabric, and adjusting mechanism for the knife-carrier having a series of stop-fingers adapted to contact with the foremost of the inserted pile-wires at different points in its length, said adjusting mechanism being so mounted that the outermost stop-finger can move forwardly as soon as the end of the pile-wire has been withdrawn past the same, substantially as specified.

37. The combination in a loom for weaving pile fabrics, of pile-wire inserting and withdrawing mechanism having as one of its elements a reciprocating slide with catch for engaging the heads of the pile-wires, pile-cutting mechanism operated by said slide, and a push-rod whereby the heads of the pile-wires may be thrust rearwardly out of range of the withdrawing mechanism, substantially as specified.

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

ALFRED F. McCOLLUM.

Witnesses:

F. E. BECHTOLD,

JOS. H. KLEIN.