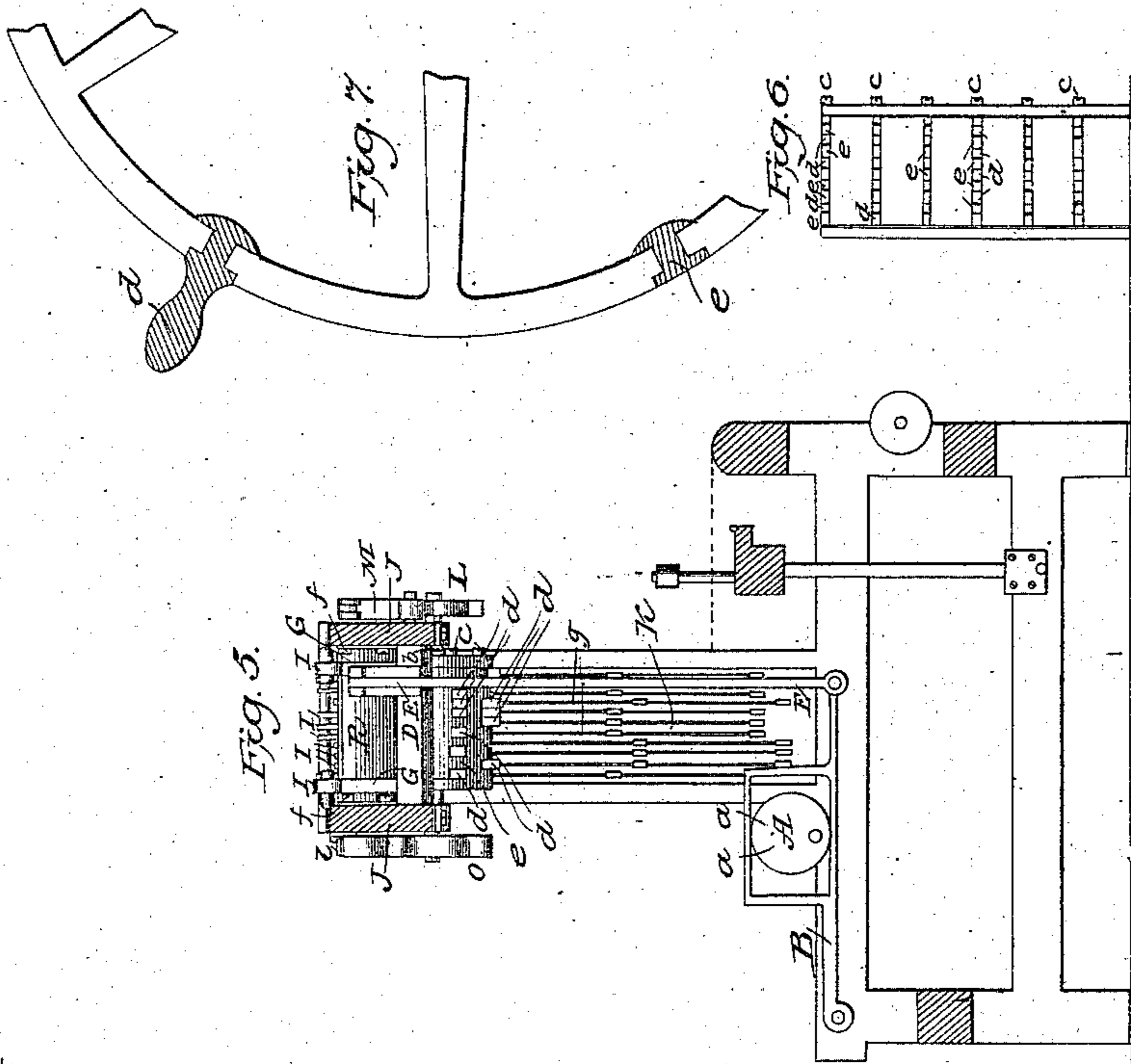
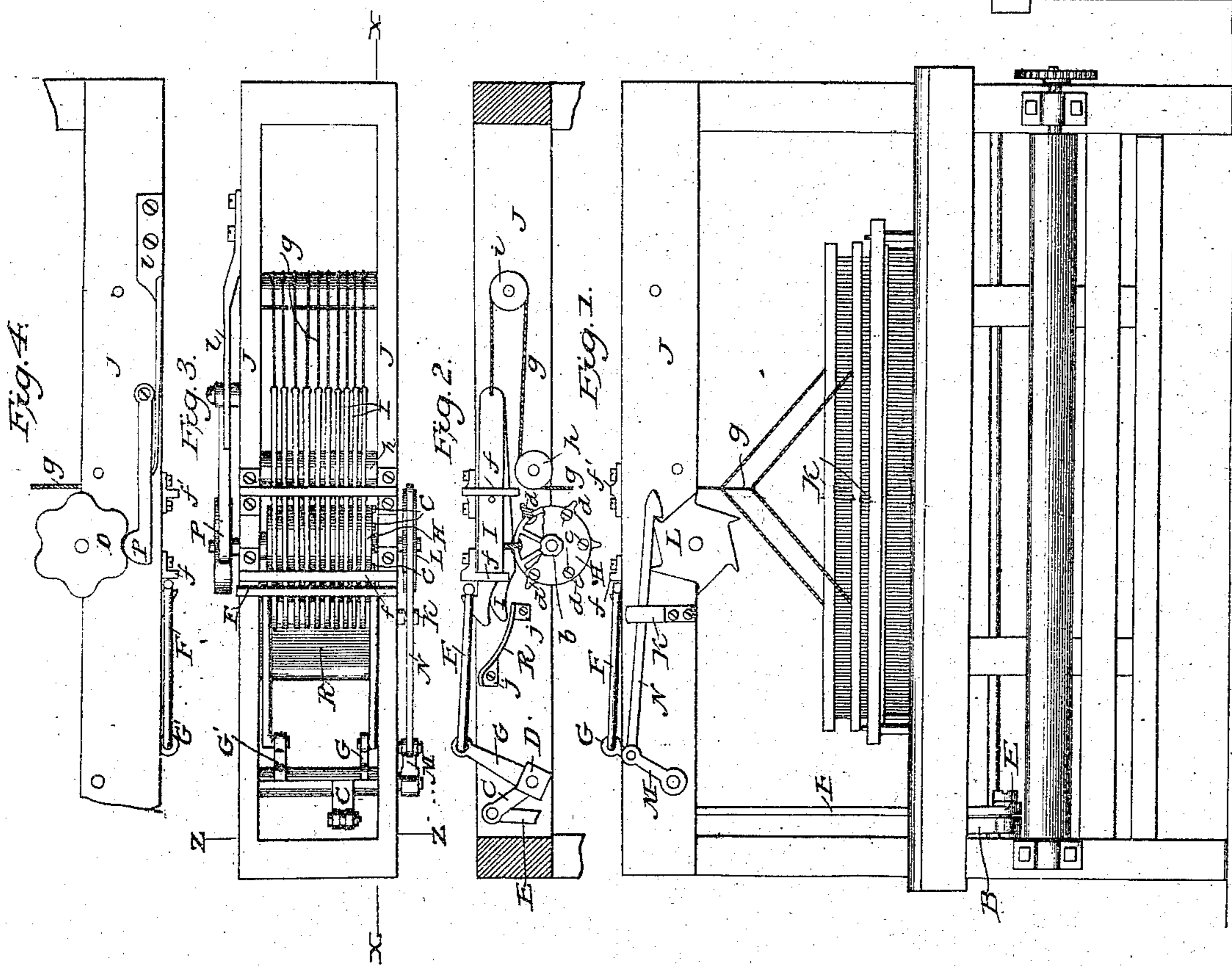


No. 7,988.

PATENTED MAR. 18, 1851.

E. M. HASTINGS & J. SHEPHERDSON.
CYLINDER FOR FIGURING LOOMS.



Specification in this form
is not in force

UNITED STATES PATENT OFFICE.

E. M. HASTINGS AND JOHN SHEPHERDSON, OF JAMESTOWN NEW, YORK.

CYLINDER FOR FIGURING-LOOMS.

Specification of Letters Patent No. 7,988, dated March 18, 1851.

To all whom it may concern:

Be it known that we, ELIAKIM M. HASTINGS and JOHN SHEPHERDSON, of Jamestown, in the county of Chautauqua and State of New York, have invented a new and useful Improvement on Machines to be Attached to any Power-Loom for Weaving Small Figures, Tweels, &c.; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a front elevation of the machine represented as attached to a skeleton of a loom to show its connection with the same, not showing the precise parts of any particular loom—or a loom in general; the machine being adapted to any power loom. Fig. 2, is a front side elevation of the machine or part of a loom herein described, not showing any part of the general or power loom to which it may be attached—leaving out in the drawing the side frame of the machine to expose to view the internal parts and being a section of Fig. 3, on a line from x to x . Fig. 3, is a top view of the machine. Fig. 4 is a back side elevation of such machine or part belonging to a loom herein represented—showing a knob wheel, and a spring holdfast. Fig. 5, is an end elevation of the general loom, and the machine attached; of which, the cross section is shown on a line from z to z , of Fig. 3. Fig. 6, shows a cam wheel developed, having a series (in this case six rows) of changeable, or movable cams inserted in the face of such wheel which serves to communicate motion to slide pieces that work the treadles; by the changing of which (and for which provision is made as hereinafter described) various, and, different figures may be elaborated and made in weaving, by the same general or changeable cam wheel; the face of such cam wheel, is shown developed, or spread out from a circle to a plane, to show at one view, the arrangement or plan of cams—for one, of a great number of plans or changes of plans, of which such cam wheel is susceptible. Fig. 7, is a segmental end view of such cam wheel—drawn full size, showing the manner of constructing the rim or face of the wheel in segments leaving slits between each division—lengthwise of such wheel, and thus forming slots for the insertion of the movable and

blank cam pieces hereafter described—in the face of such wheel.

The letters of reference marked on the drawings indicate like parts in all of the figures, and the dimensions are given by a scale of inches in the margin of the sheet of drawings.

We wish to observe that we do not intend to confine ourselves to the precise description herein given, but to vary its construction in any particular, retaining however, substantially the principle of action and the effect produced herein set forth and described.

The distinguishing feature of our invention consists in a cam wheel of a peculiar construction; by which a series of shifting or movable cam pieces are inserted with blank pieces of equal thickness in slots made lengthwise of such wheel in the face of the same; which cam pieces are made to act upon a set of slide pieces attached by or through a cord to the treadles or harness of the loom, and by which the figure or tweel of the web is dictated and determined.

The blank pieces so called above, consist of pieces of metal, that fill an equal space in the slot of the face of the wheel, as do the cam pieces themselves, as such latter pieces may by change of the figure of the web, occupy the precise span to give action to a slide piece required in such change of figure, these blank pieces do not rise or project beyond the face of such camwheel—or the general face or cylinder of the same; such cam piece and each blank piece together—that is, a pair—fill a longitudinal space in the slot of such cam wheel—corresponding with the thickness of each slide piece and one space between them; such slide pieces occupy a position immediately above, transversely to such cam wheel to the end that such slide pieces by the action of such cam pieces, may be lifted and raised up at one end to a level, that a grapple bar to be described hereafter may form connection, by hooks, with them; and after which, to slide along such pieces; and by which the treadles are worked and raised; now by the changing or resetting of these cams, and blank pieces, a change in the figure or tweel to be woven may be made inserting in the slot of the cam wheel cam pieces opposite to the slide pieces required to be raised up—and filling in such slot blank pieces opposite to the slide pieces re-

quired to remain at rest in each row of cams in the cam wheel, and so fill in each row of cams throughout the circumference of such cam wheel—the same is ready for use, and in this way may be changed at pleasure.

The divisions of the rows, or series of cams upon the cam wheel correspond in point of time with the strokes of the lay, and whether there be two rows of cams to a wheel (the least number possible), or fifty, this relation is kept up; the more the series, the more extensive can the figure of the web be made; the length of cam wheel will correspond with the number of slide pieces, and harness to be used in producing a given result or figure.

The machine herein described, it will be seen represents six rows, or series of cams in the cam wheel, and the number of slide pieces are ten, but these members may be varied, less or more without departing from the principles of action of the machine herein described.

To enable others skilled in the art of building looms and machines of this character to make construct and put in operation our invention we proceed to describe its construction and operation.

To any common power loom, and to the main shaft, (or counter shaft of appropriate speed) of said loom, we place the driving cam A, which cam is nearly a true eccentric—being concentric only on a line from *a* to *a* to allow time for the grapple bar F, to fall down by its gravity into catches at the ends of the slide pieces I, fully and fairly, before its return movement is commenced; which cam A, gives action to the cam yoke B, which yoke is connected with the arm C on rock shaft D, by the connection rod E; the grapple bar F, is operated by the arms G, G', of rock shaft D, which grapple is made to rest and slide on the sides of the frame of the machine J, J, but rises freely over the catches of the slide pieces when thrown forward by the arm of the rock shaft to grapple and catch such slide pieces as may be raised by the cam pieces in the cam wheel H, which cam wheel H is shown in Fig. 2, with a part of the temper screw head left out—to reveal and show its internal structure; whenever a change of cams and blank, are required, the screw nut *b* is loosened or turned back, and the wheel head otherwise called "the temper screw head" containing the temper screws, is also drawn back sufficiently to take out of the slot in the cam wheel, the cam and blank pieces; others may then be substituted in their place under any new arrangement of design required; when the screw nut *b* being again screwed down, and the temper screws *c*, *c*, *c*, *c*, *c*, and *c*, be turned upon the rows of cams and blanks in the slot, to tighten and secure each row separately, the cam wheel is

again reorganized and ready for use upon a new figure; *d d d d d* and *d* are the cam pieces of said cam wheel, and *e* (see Fig. 7) are the blank pieces of the same. I, the slide pieces which are guided and held in position by the guide bars *f*, *f'*, attached to the sides of the frame of the machine J, J, and connected to the harness, or treadles K by the cord *g*, passing over guide rollers *h*, and *i*; these slide pieces have detent, or check pins—seen at the guide bar *f'* to arrest motion backward at the proper time and point required; the slots in the guide bar *f'* for the steadymen of that end of the slide pieces, are no larger than to let the pieces I, slide freely; but the same are elongated in the guide bar *f*, to allow the slide pieces to rise by the action of the cam pieces *d*, to lock with the grapple bar F; L, is a ratchet wheel at the front side of the machine, placed upon the outward end of the shaft of the cam wheel H, the notches of which correspond with the number of slots and rows of cams and blanks in such cam wheel, and is operated by the arm M on rock shaft D, by the catch lever N, the catch being guided and directed by the stand *k*, on the sides of the frame of the machine; O, is a knob wheel, and P, is a hold fast acting therewith, held down by the spring *l*; which knob wheel is placed on the back end of the cam wheel shaft, and serves as a break to hold at rest the cam wheel, while the back motion of the catch lever N, is worked; R, is a cross guide plate fastened to the side pieces of the machine J, J, by screws *j j j j* and serves to prevent the slide pieces from dropping down and losing their hold upon the grapple bar F, in their forward movement in changing the shade of the web.

Operation: The cam A, gives to the rock shaft D, continuous vibrating motion, which shaft through its arms G and G', throws forward the grapple bar F, over the catches of the slide pieces I,—the cam A, being concentric during a small division of its circumference as before explained—the grapple bar F, rests an instant to fall by its own gravity into lock with such of the slide pieces as are raised by the cam pieces *d*, into a line that admits of the same, at the same time, and by the same movement of the rock shaft D, through the arm M, the catch lever or feed hand N, is thrown forward and drops upon one spur or ratchet of the ratchet wheel L, the shuttle crossing the web during the time of the above named vibration of the rock shaft—the cam wheel being at rest—and the shade of the web open, admits the passage of the shuttle; upon the return vibration of the rock shaft D, by the action of the cam A, the ratchet wheel L, through the catch lever N, rotates the cam wheel H, one division of its rows of cams and blanks, and raising by such succeeding row thus

brought forward, such slide pieces as are not already raised by the preceding row for the next change of the shade of the web in accordance with the design; creating a space,
5 by bringing forward blanks to such slide pieces as are required to be down; during which and simultaneous with the same, the grapple bar returns, permitting such slide pieces as had been locked to, and carried
10 forward by such bar—to return back again by the weight of the treadles, or by the aid of springs or weights attached to the lower part of such treadles—changing the shade of the web preparatory to the next throw of

the shuttle; which passes as before mentioned, and the operation is repeated and continued. 15

What we claim as new and desire to secure in Letters Patent is—

The mode of connecting the movable cams 20 *d*, and slide pieces I, with the drum H, substantially as set forth and for the purpose herein stated.

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JOHN SHEPHERDSON.

Witnesses:

WM. H. FENTON,

R. F. FENTON.