4 Sheets—Sheet 1.

S. NORTHROP.

LOOM.

No. 7,876. Patented Jan. 1, 1851.

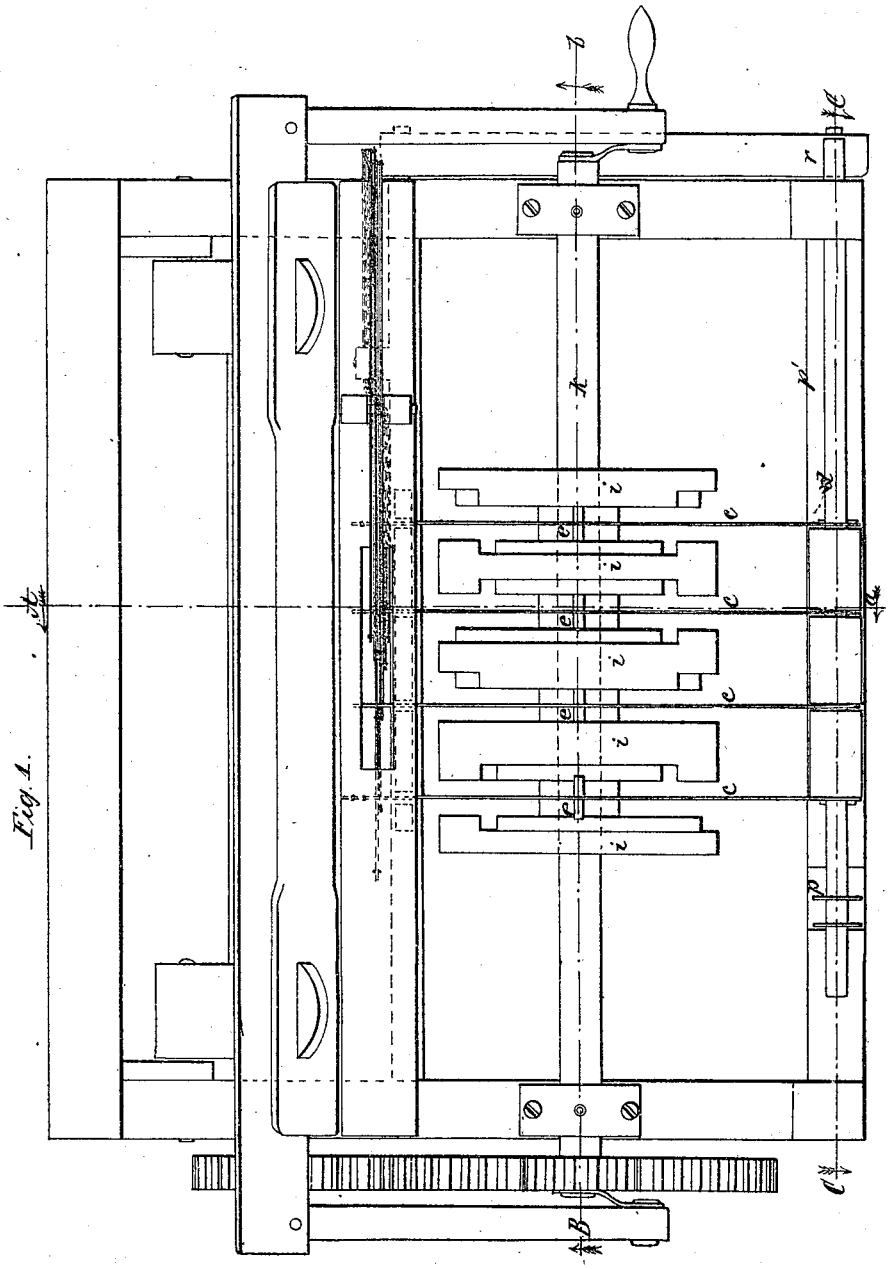

Fig. 1.

S. NORTHROP.

LOOM.

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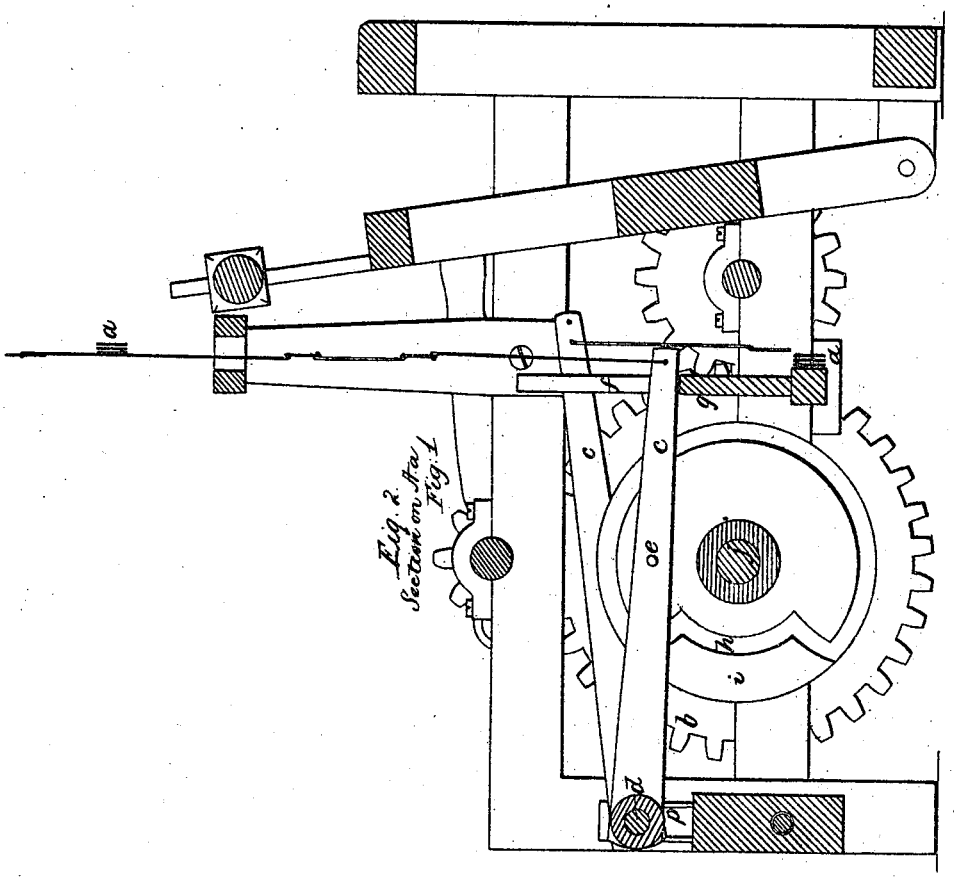

4 Sheets—Sheet 3.

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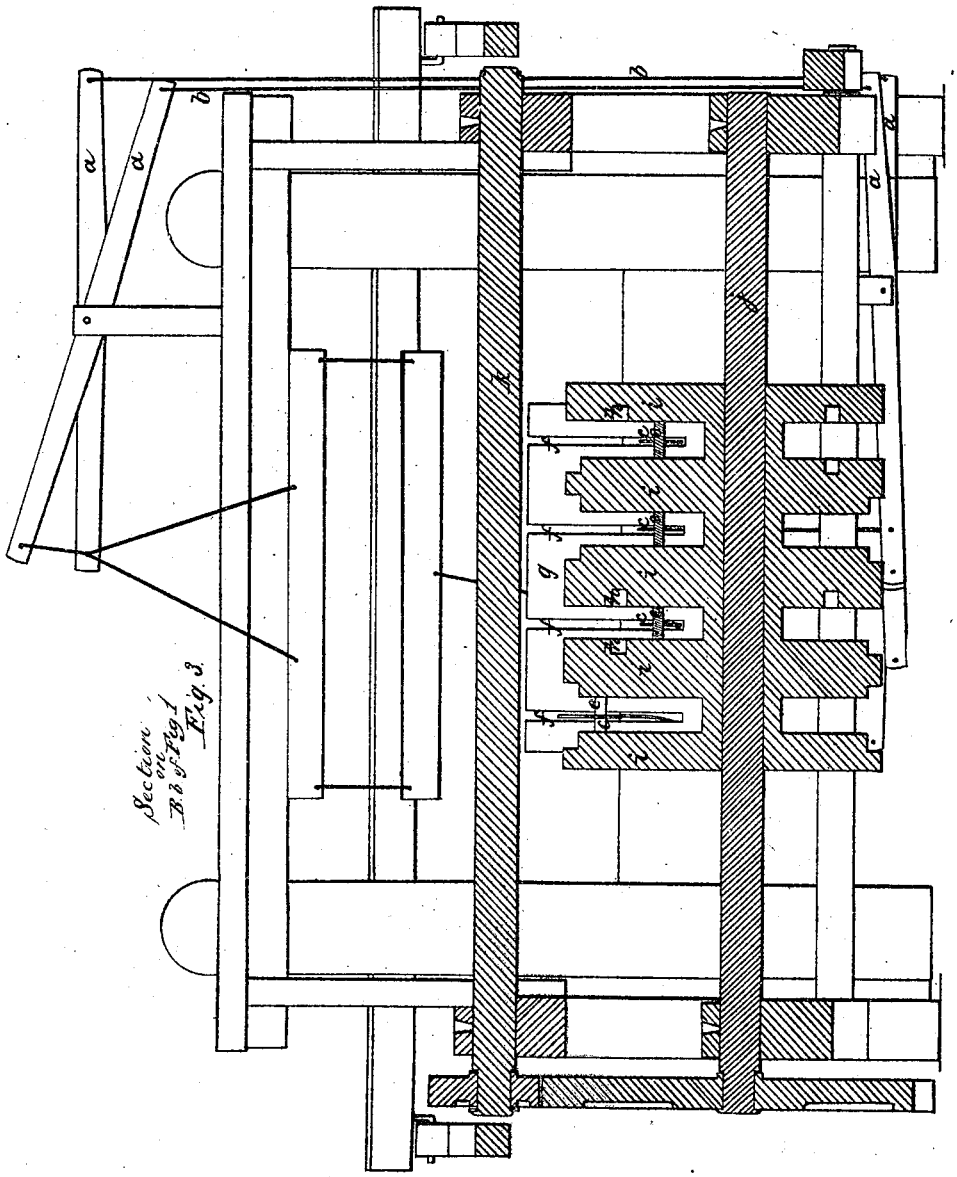

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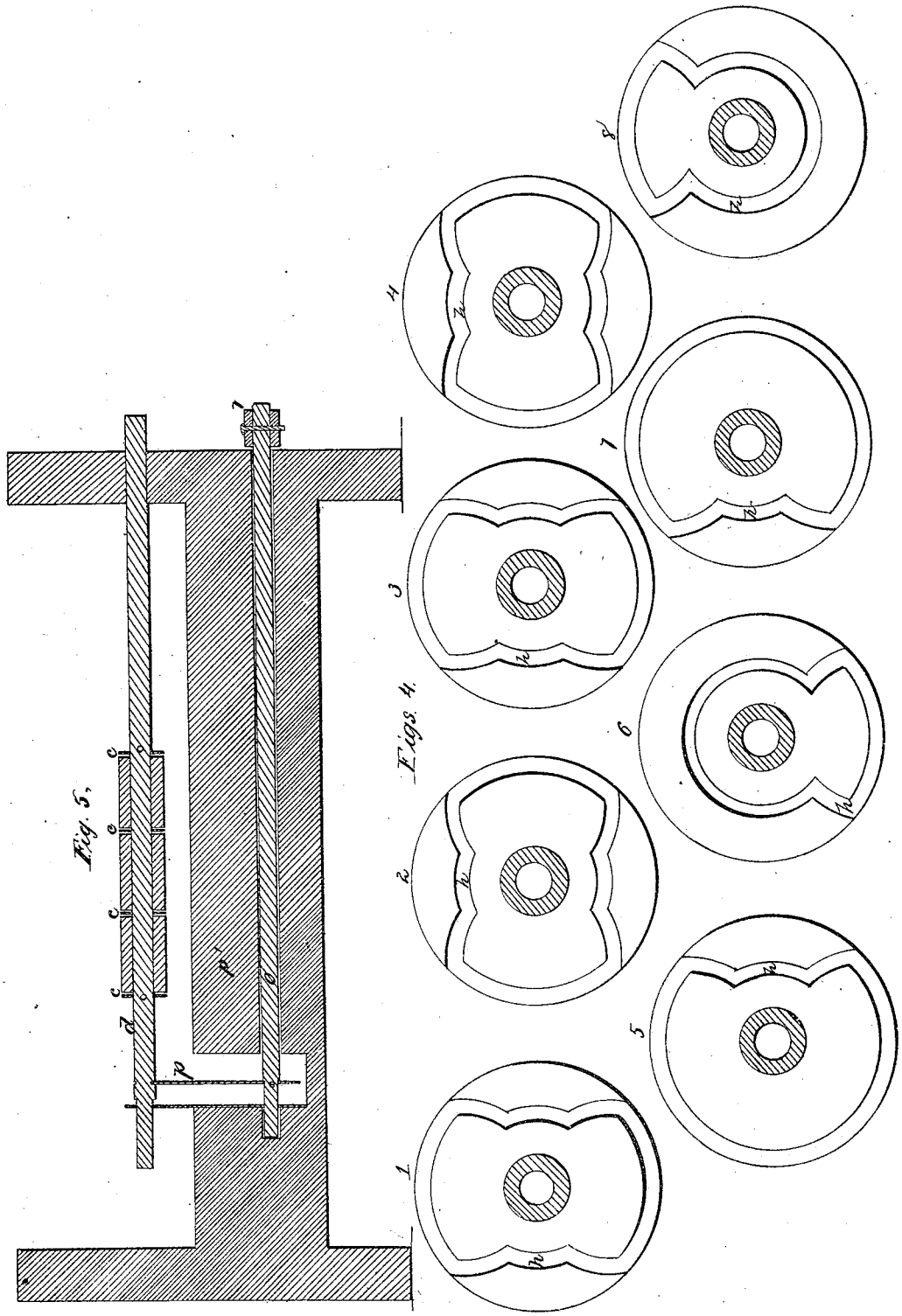
S. NORTHROP.

LOOM.

No. 7,876. Patented Jan. 1, 1851.



UNITED STATES PATENT OFFICE.

SHELDON NORTHROP, OF NEW MILFORD, CONNECTICUT.

LOOM FOR WEAVING SEAMLESS BAGS.

Specification of Letters Patent No. 7,876, dated January 1, 1851.

To all whom it may concern:

Be it known that I, SHELDON NORTHROP, of New Milford, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in the Power-Loom for Weaving Seamless Bags, and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of the loom; Fig. 2, a vertical section taken at the line (A *a*) of Fig. 1; Fig. 3, another vertical section taken at the line (B, *b*) of Fig. 1; and Fig. 4, a face view of the series of cams for working the harness treadles to represent the relative positions of the cam grooves; and Fig. 5 is a vertical section on the line (C, *c*) of Fig. 1.

The same letters indicate like parts in all the figures.

The loom as improved by me is for the purpose of weaving seamless bags by weaving the cloth double and united at one or both selvages for a given distance to form the bag, and then at given distances apart weaving the cloth single to unite the two cloths; and to this end my invention consists in arranging and combining two series of cams, one series to work the warps so as to weave two cloths either united at one or at both selvages, and the other to interlock or interweave all the warps to make a single cloth, when this is combined with a shifting apparatus to connect at pleasure either series of cams with the treadles that operate the harness.

The accompanying drawings represent a loom of the usual construction for weaving plain cotton cloths except in the mode of operating the harness. It is mounted with four leaves of heddles which are connected together in the usual manner by means of two sets of levers (*a*, *a*, *a*, *a*,) at top and bottom, and connected with and operated by means of treadles (*c*, *c*, *c*, *c*) that vibrate on a fulcrum rod (*d*) at the back. Each treadle has a wrist or roller (*e*) projecting from each face, which are received and work in the cam grooves, and to keep all the treadles at the same distance apart their forward ends work in grooves (*f*, *f*, *f*, *f*) in a vertical plate (*g*).

The cam grooves (*h*) for working the treadles are made in the face of five disks or wheels (*i*) mounted on one and the same shaft (*j*) which receives the required rotary motion from the crank or lay shaft (*k*) by means of a cog wheel and pinion (*l*) and (*m*) the wheel being to the pinion as four to one that the lay shaft may make four revolutions to one of the treadle cam shaft. The two outer disks or wheels (*i*) are single, that is have but one cam groove, while the three inner ones are double, that is, have cam grooves on each face so that this makes eight cam grooves, double the number of treadles, and the eight are divided into two series, the first series being numbered (1, 2, 3, 4), and the second (5, 6, 7, 8), and the spaces between the disks or wheels are so great that when one of the series of cams operates the treadles the other series although on the same shaft will work clear of them, and vice versa, for the two series are required at different times.

The shifting of the treadles from one series of cams to the other is effected in the following manner. The fulcrum rod (*d*) of the treadles slides freely lengthwise in the main frame of the loom and is connected by a spring plate (*p*) with a parallel rod (*o*) which slides in a hole in the beam (*p'*) of the frame, one end projecting beyond the end of the frame and is there attached to a bar (*r*) which slides freely endwise in the main frame, and to which the plate (*g*), (in which the treadles work,) is attached, as also the lower set of heddle levers (*a*). In this way and by this arrangement it will be seen that when the bar (*r*) is shifted to one side or the other it shifts the forward end of the treadles and by the tension of the spring plate (*p*) draws the fulcrum rod (*d*) of the treadles in the same direction which brings the wrists or rollers on the treadles against the faces of one of the series of cam groove wheels until by the rotation of the said wheels the came grooves permit the wristpins or rollers to enter which they do by the tension of the spring plate (*p*). In this way the treadles can be shifted from one of the series of cam grooves to the other at pleasure; and without any danger of breaking any part of the machinery. The form and relative position of the cam grooves of the series (1, 2, 3, 4) is fully represented in Fig. 4 where the disks or wheels instead of being represented on a shaft are laid on a

plane with two parallel lines representing the shaft.

The cam grooves are so formed that number 1 keeps its treadle up during three picks and down during the fourth pick—there being four picks for each revolution of the cams. No. 2 keeps its treadle up during one pick and down during the fourth pick. No. 3 is similar to No. 1, but reversed, and number 4 is similar to No. 2 and also reversed. By this arrangement and alternation it will be seen that the four divisions of the warps operated by this means will form two cloths united at the selvages, that is, will weave a continuous cloth, the weft instead of passing back and forth with the shuttle, being carried in a continuous circuit, therefore making a cloth without selvage. When the required length of double cloth has been woven the treadles are shifted to the other series of cam grooves (5, 6, 7, 8) which are so arranged as to interlock all the warps to weave a single cloth. Cam groove No. 5 corresponds with No. 7, and No. 6 with No. 8, and they shift with every pick, and produce the same effect as if two heddles only were used as in the usual way of weaving plain cloth, but as not less than four heddles will answer the purpose for the double cloth the same number must of necessity be used for the single cloth.

In operating this loom for weaving bags, the best mode of procedure is to weave at first about one inch of single cloth by means of the cams 5, 6, 7, and 8 to make the closed end of one bag—then a sufficient length of double cloth for two bags is woven by means of the cams 1, 2, 3, and 4 and then again a sufficient length of single cloth for the closed ends of two bags, and so on to the end. And when the whole piece has thus been woven it is cut across in the middle of the lengths of single cloths, to make the closed ends of the bags, and in the middle of the double lengths to make the open ends of the bags. When it is desired however to weave the bags with their lengths in the direction of the weft instead of the warps, the double portions of the cloth must be woven with two selvages at one side and a closed selvage at the other, the closed selvage making the bottom or closed end of the bag and the double selvage the mouth or open end, the sides being formed by the alternate strips of single cloth; but for this purpose the series of cams 1, 2, 3, 4 must be so arranged as to interlock the warps that form the upper cloth during two picks, and then interchange for the next two picks with the warps that form the under cloth, then back and forth for the under cloth and so on to the end.

I wish it to be distinctly understood that I make no claim to the form of the series of cams, nor simply to the shifting of the treadles, as these may be varied without changing the principle of my invention, as any mode of operating the treadles in the succession required for each operation separately will answer the purpose, and it will be obvious that instead of shifting the treadles from one series of cams to the other, the two series of cams may be shifted to the treadles.

What I claim as my invention and desire to secure by Letters Patent is—

The arrangement in one loom of the two series of cams, substantially as described, one series for weaving the cloth double and the other single, as herein described, in combination with shifting the treadles from one series of cams to the other, or the equivalent thereof, substantially, as herein described.

SHELDEN NORTHROP.

Witnesses:

DAVID D. NORTHROP,

ROSWELL NORTHROP.