

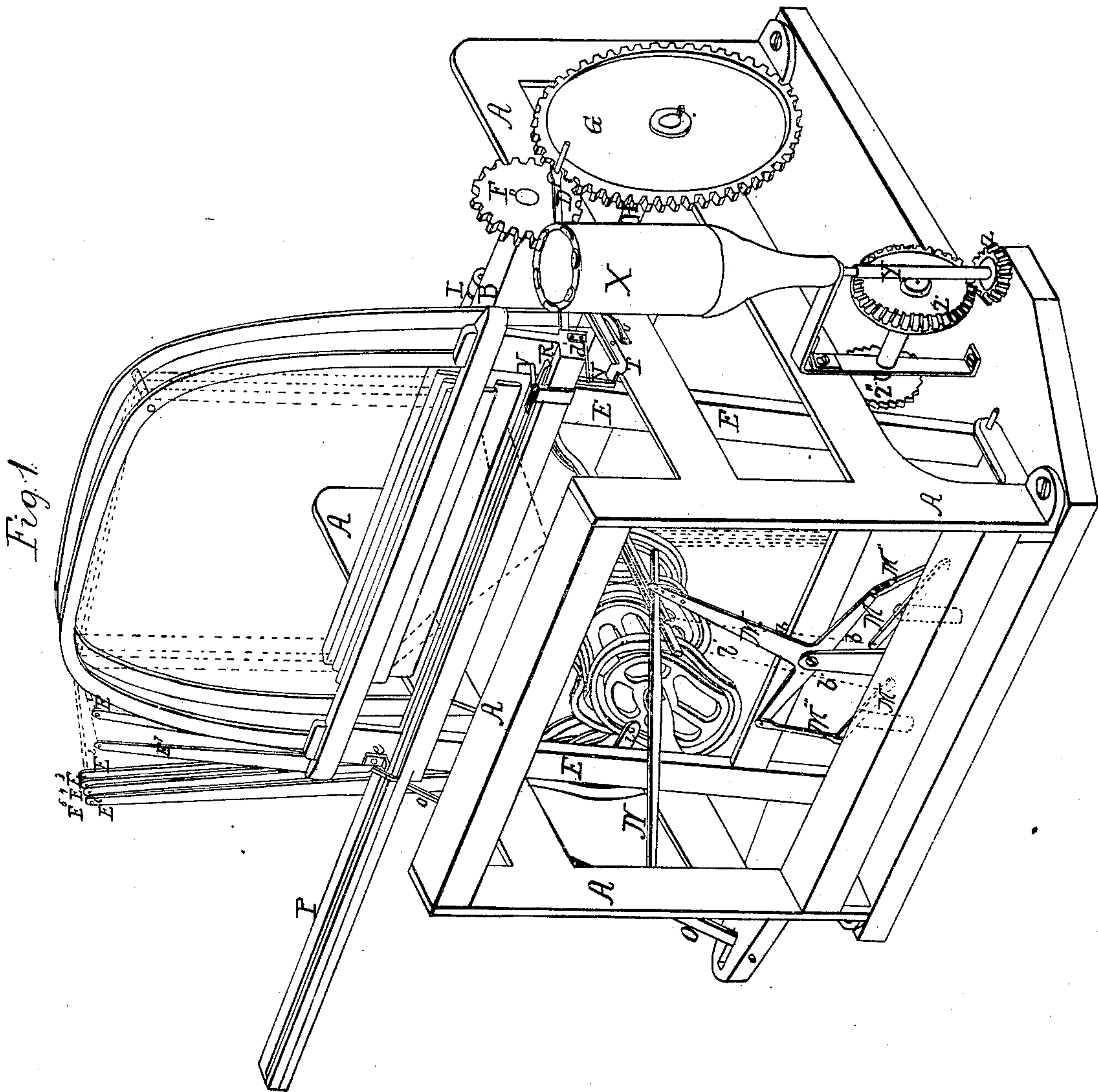
Sheet 1, 3 Sheets.

S. B. & S. M. Chaffee.

Weaving Hair Cloth.

N^o 21,793.

Patented Oct. 12, 1858.

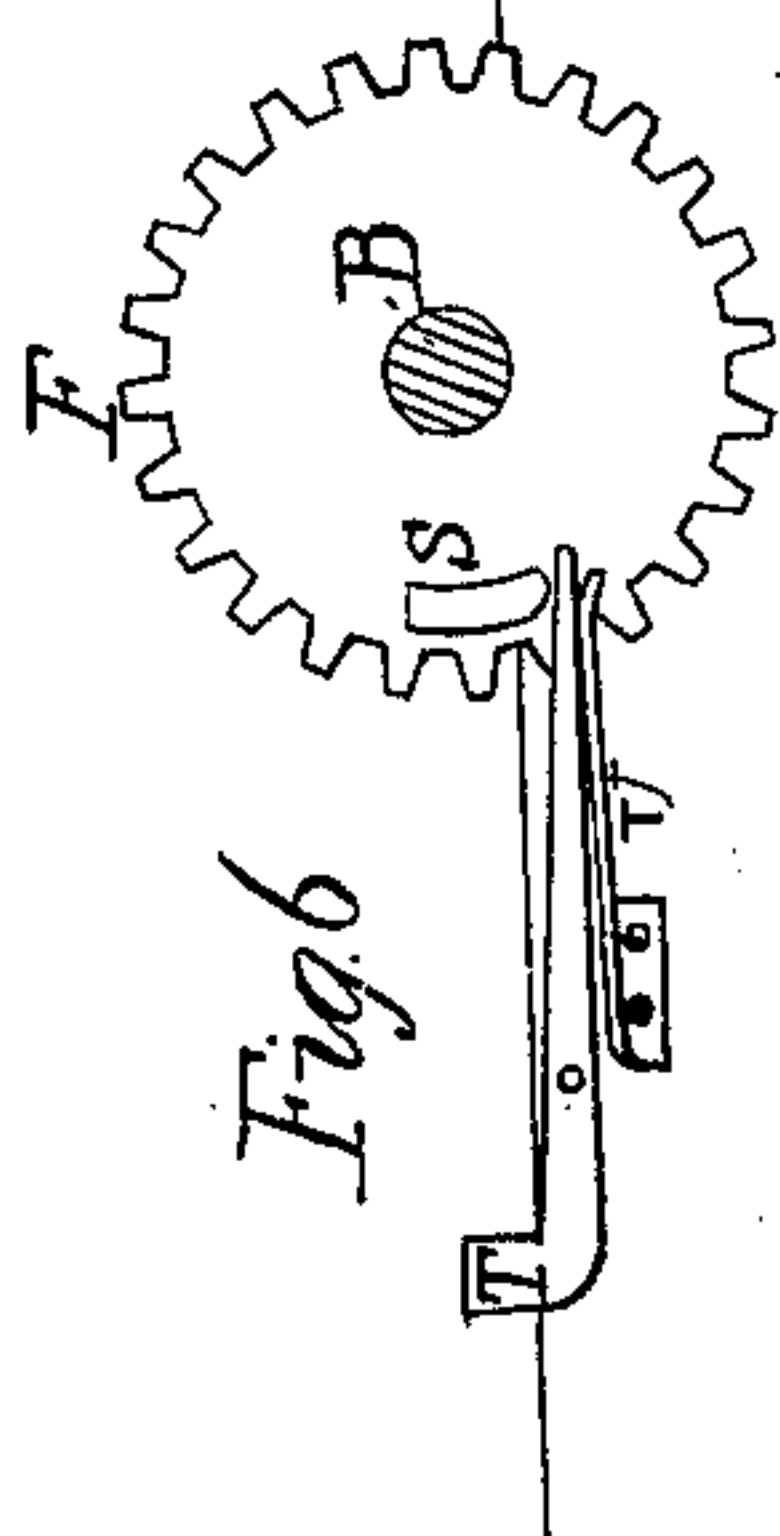
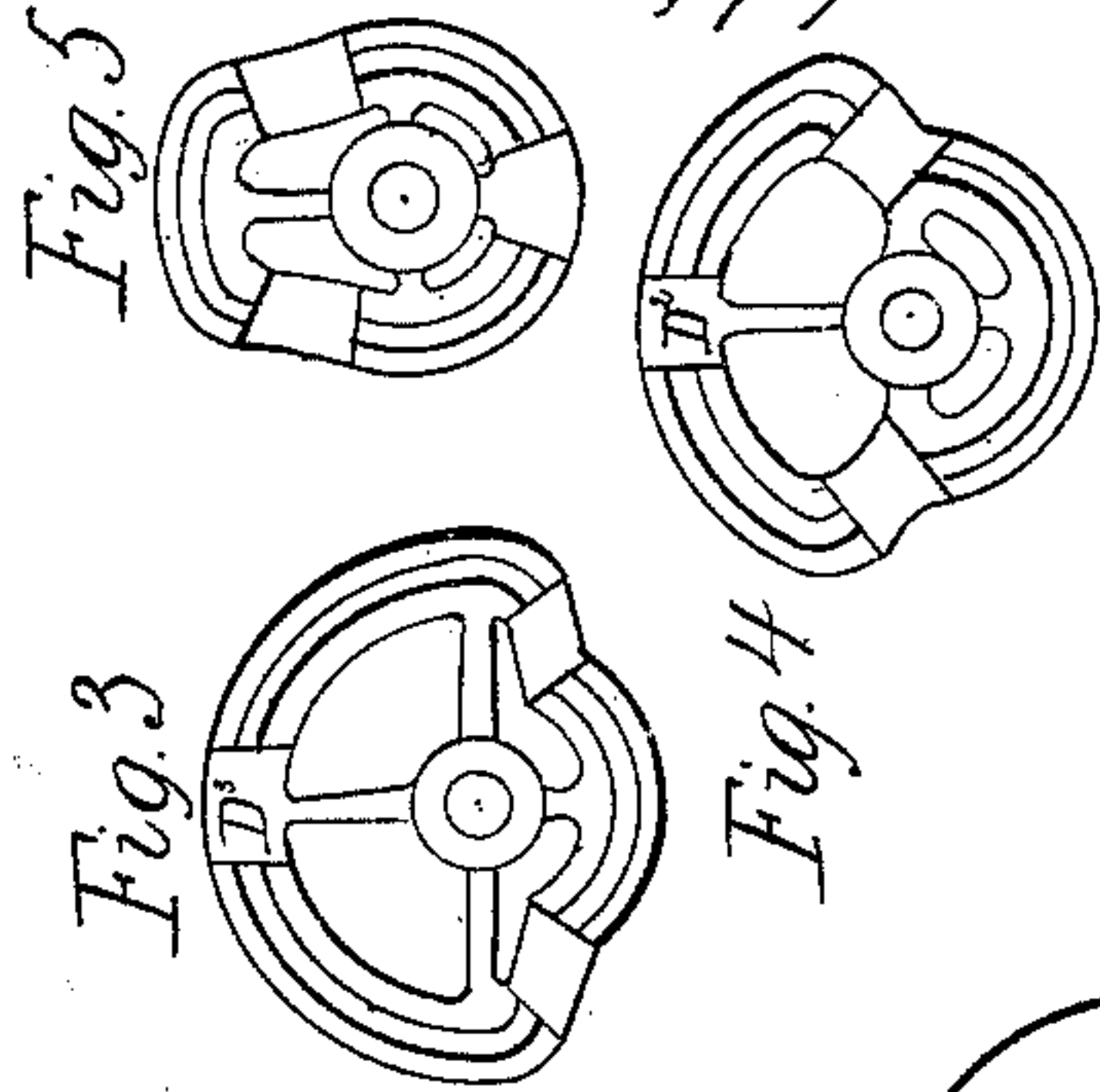


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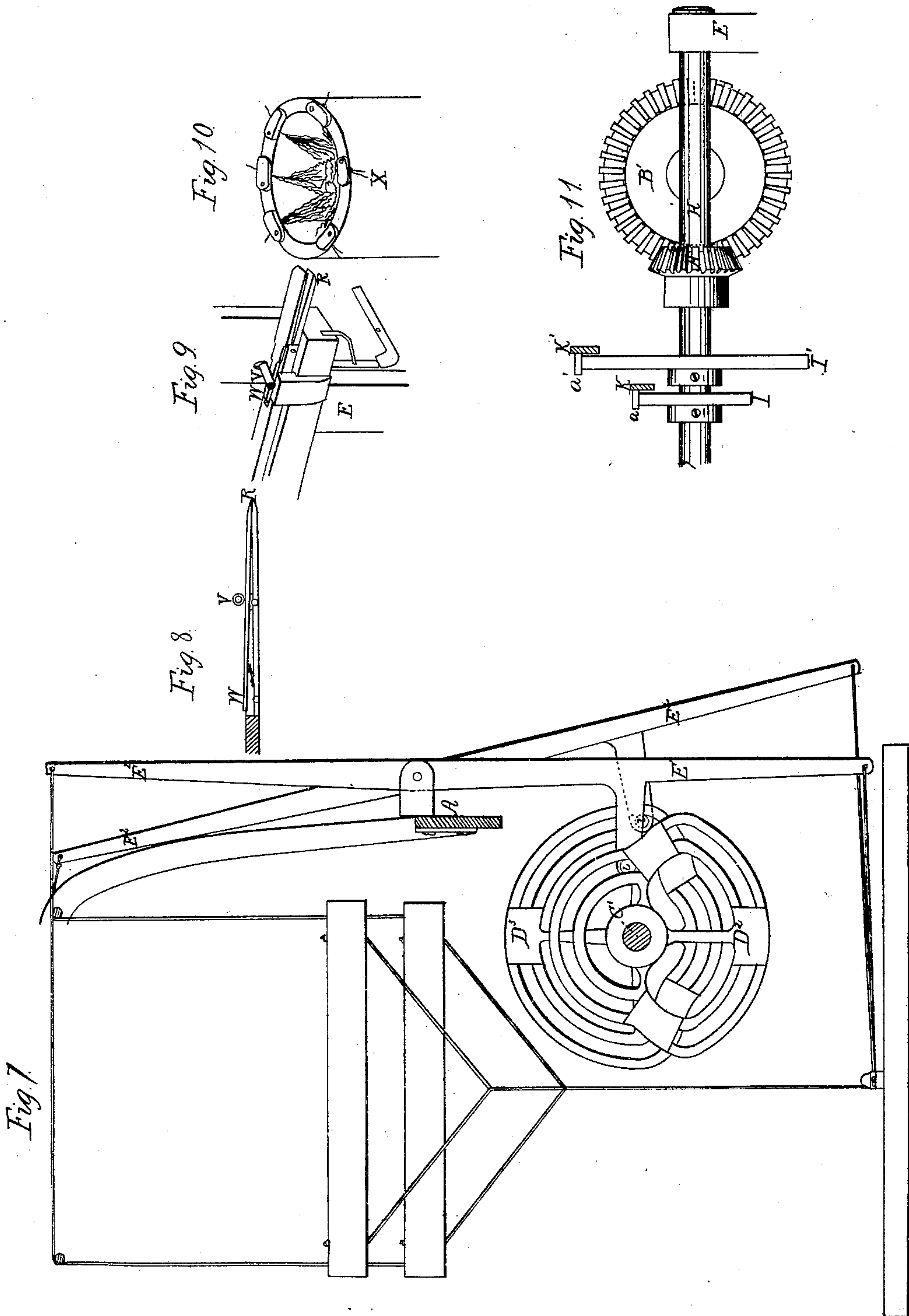


S. B. & S. M. Chaffee.

Weaving Hair Cloth.

N^o 1,1793.

Patented Oct. 12, 1858.



UNITED STATES PATENT OFFICE.

SAMUEL B. CHAFFEE, OF PROVIDENCE, RHODE ISLAND, FOR HIMSELF AND AS ADMINISTRATOR OF S. M. CHAFFEE.

IMPROVEMENT IN LOOMS FOR WEAVING HAIR-CLOTH.

Specification forming part of Letters Patent No. 21,793, dated October 12, 1858.

To all whom it may concern:

Be it known that I, SAMUEL B. CHAFFEE, (in connection with SAMUEL M. CHAFFEE, now deceased,) of Providence, in the county of Providence and State of Rhode Island, have invented certain Improvements in the Power Loom for Weaving Hair-Cloth; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the loom complete. Fig. 2 is a vertical longitudinal section. Fig. 3 is a side elevation of the outer selvage-cam. Fig. 4 is a similar view of the inner selvage-cam. Fig. 5 is a similar view of the other cams for working the treadles. Fig. 6 shows the arrangement for opening and shutting the jaws of the nippers at the end of the shuttle. Fig. 7 is a side elevation of the selvage-cams and the treadles and harness connected with them. Fig. 8 shows the shuttle-point closed. Fig. 9 shows the same open to receive a hair from the cylinder. Fig. 10 is a view of the hair-cylinder. Fig. 11 shows the mode in which the cam-shaft is driven.

The same part is marked with the same letter in all the figures.

Our invention consists in the improvements in the hair-cloth loom hereinafter described and claimed.

In the drawings, A marks the frame of the machine. Transversely across the top of this frame is placed in the position shown the main shaft B, to which the driving-power is applied in any convenient mode. This shaft has on one end a wheel C, having a rod D pivoted to it and connecting it with the sword E of the lathe. On the other end of shaft B is a spur-wheel F, meshing into wheel G on the end of cross-shaft H. This wheel F has a rod D' attached to it in the same way as rod D is attached to wheel C and pivoted to the sword of the lathe. These two rods D D' act in concert to give the reciprocating or vibrating motion to the lathe. The cross-shaft H carries two cams I I', which actuate rods K K' by means of pins a a', attached to said rods and resting on the upper surface of the cams, as shown in Fig. 2. The rods K K' are hinged at L. To their free ends are attached

cords b b', which connect with a series of levers M' M'' M''' M'', which give a reciprocating or vibratory moment to lever M as the rods I I' alternately rise and fall. The lever M is attached by rod N to the jack-shaft O, which it causes to vibrate in the slot in the shuttle-box P. The jack-staff O passes through a slot in the end of the shuttle and imparts the required reciprocating motion to it. The shuttle is a long rod sliding freely in the box or trough P. Its point is composed of a pair of nippers R, closed by a spring, which keeps the inner end of the upper jaw pressed upward, as seen in Fig. 8. When the shuttle-point is thrown forward, it passes under a roller V, which, pressing down the inner end of the upper jaw of the nippers, opens these, as seen in Fig. 9. The roller V plays on the bent end of a rod V', which passes through a slot in the lathe. This rod is capable of vertical reciprocating movement in guides, and is held down by a spring d' on the lathe. When the lathe is thrown forward, the lower end of rod V' is brought directly over the broad seat on the end of lever T, which is at the same moment caused to rise by the operation of cam S on its other arm. (See Fig. 6.) The arm of lever T, which is depressed by cam S, is brought up after the passage of the cam by spring U.

The cylinder X contains the hair for the filling, which is kept wet. The top edge of this cylinder has notches covered with buttons for the passage of the hair to the shuttle. Its shaft Y is vertical and has a bevel-pinion Z at its lower end gearing into bevel-wheel Z' on the end of a short horizontal shaft, on whose other extremity is the ratchet-wheel Z'', driven by a pawl attached to the sword of the lathe.

The operation of that part of the loom which has thus far been described is as follows: As the main shaft B revolves, the lathe is caused to beat up and be thrown back by means of the rods D D', connected as shown. At the same time the shaft H is revolved, and by means of cams I I', rods K K', lever M, rod N, and jack-staff O, gives the required motions to the shuttle. The nippers, which form the point of the shuttle, open as they approach the hair-cylinder by the pressure of roller V, as before described, and they close when the

lathe has "beat up" by the relief of that pressure. When thus closed, they are drawn back, carrying with them the hair for the filling. When sufficiently far back, they are opened to release the hair by the knee *e*, which may be placed at any point required by the width of the cloth. The formation of the successive sheds through which the shuttle passes is effected by the operation of seven cams on cam-shaft C', which operate the treadles that raise and depress the harness. The shaft C' has a bevel-wheel B' on its rear end gearing into bevel-pinion A' on shaft H and driven by said pinion. On said cam-shaft C' are placed seven cams, which are marked, respectively, D² D³ D⁴ D⁵ D⁶ D⁷ D⁸. (See Fig. 2.) The cams D² and D³, I call the "selvage-cams," and their forms are shown in Figs. 3 and 4. The other cams are alike and have the form shown in Fig. 5. These seven cams actuate, respectively, the seven treadles E' E² E³ E⁴ E⁵ E⁶ E⁷ by means of pins *i i*, attached to the treadles and traversing the grooves in the cams as these revolve. The treadles are connected at their upper ends by cords to their respective harness and heddles. The cams D² D³ work the treadles connected with the heddles, which carry the web for the selvage of the cloth. The other cams control the web for the body of the cloth. The cams are so placed on the shaft C' as to operate the treadles and heddles in the following order: At the commencement of the operation the heddles controlled by cams D³ and D⁸ are drawn up, while the other five are down. These form the first shed. The second shed is formed by the descent of the heddle controlled by D⁸ and the rising of that worked by D⁶, the front selvage-heddle D³ remaining up. The third shed is formed by the rise of heddles connected with D³ and D⁴, the others being down. The fifth shed is formed by the rise of heddles connected with cams D² and D⁷, the others being down, and the sixth and last shed is the same as the first. The operation is now repeated. Through each shed the shuttle draws the hair for the filling, and the lathe is beat up in the usual way.

The web, prepared in the usual way, is divided among the seven heddles, the portion

assigned to the selvage-heddles depending upon the width of selvage required.

In all hair-cloth looms selvage-heddles are employed, but hitherto the mode of working them has been by attaching them by means of cords to the other heddles. One selvage-heddle was attached to its set of three heddles and the other to its set of two heddles, and they were made to rise by the cords alluded to and to fall by means of weights. The use of independently-operated heddles saves this gearing of cords and weights, and is therefore an economical advantage. Again, the selvage-heddles were so attached to the cords referred to that when the loom was in operation they were carried part way down by the weight and twitched back by the cords, one of them once and the other twice, before reaching the place where their office is to be performed. These motions, which are not only unnecessary, but positively injurious to the fabric, wearing it out by friction, are got rid of by the use of independent heddles. In our loom the selvage-heddles rise and fall only when they are required to do so to form the selvage, remaining stationary at other times. The warp is therefore not needlessly worn. In the old mode the cords connecting the heddles are liable to become entangled, preventing the formation of a perfect selvage, a fault completely remedied by the regular independent and reliable action of the heddles in our improved loom.

What we claim, and desire to secure by Letters Patent, is—

1. Forming the selvage of hair-cloth by means of a set of heddles operating independently of the heddles used in forming the rest of the cloth, substantially as described and shown.

2. The method described of operating the jack-staff by the combination of the cams I I', rods K K', levers M, and rod N, as specified.

SAMUEL B. CHAFFEE,

For self and as administrator upon the estate of Samuel M. Chaffee.

Attest:

ALEXR. T. BRITTON,
BENJAMIN D. JONES.