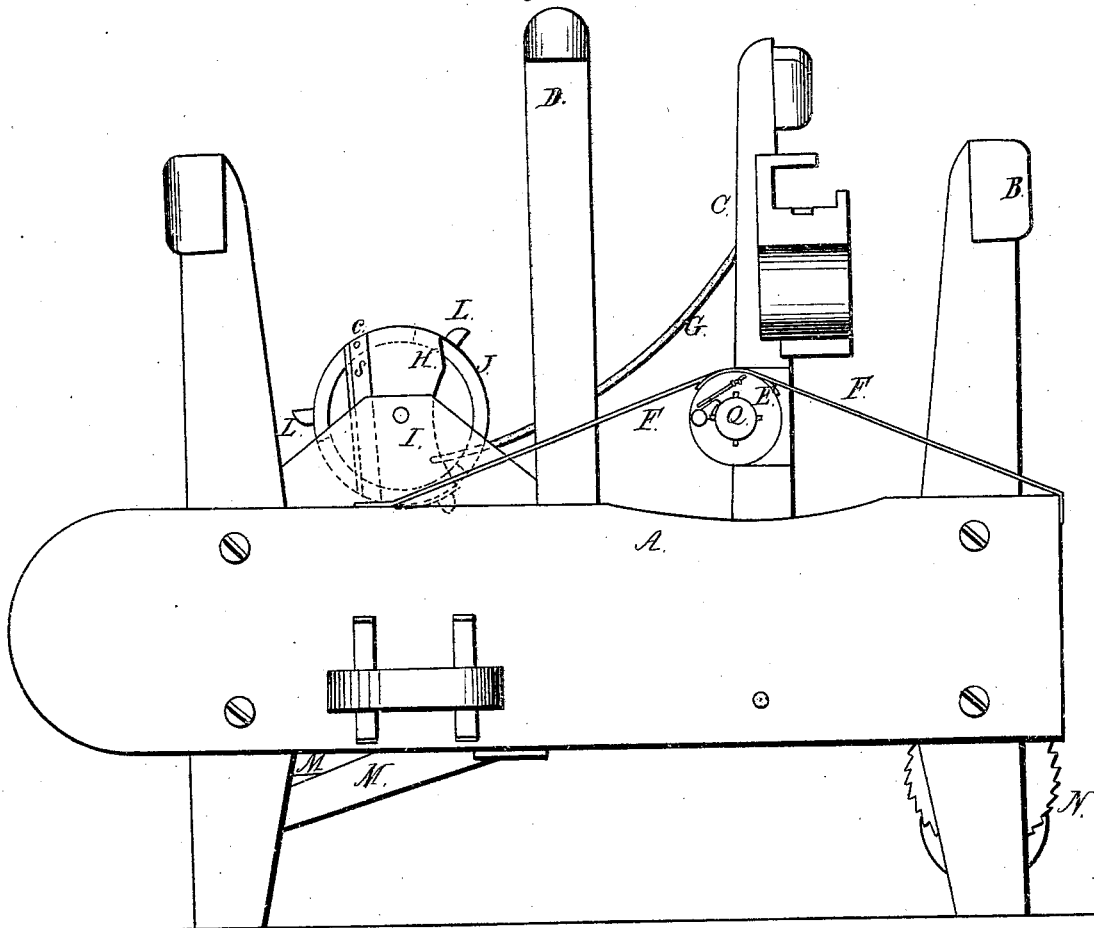


Carter & Spake. Hand Loom.

N^o 54,501.

Patented May 8, 1866.

Fig: 1.



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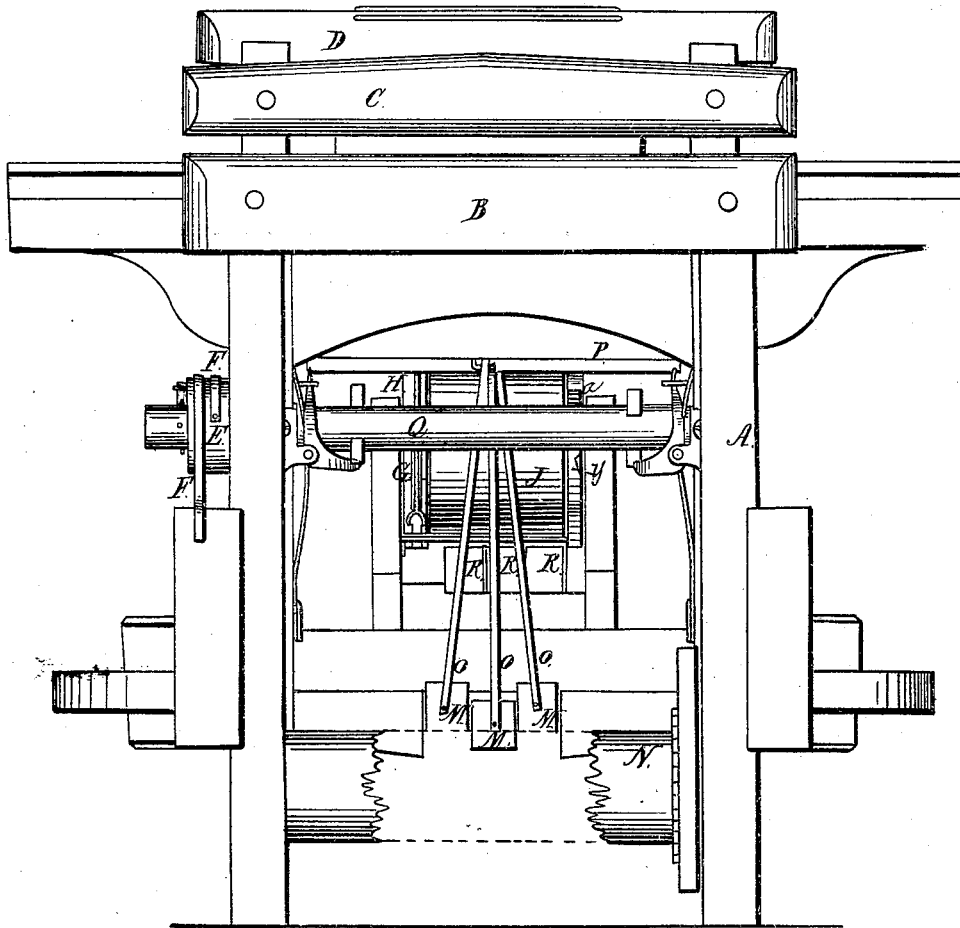
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Fig: 2.



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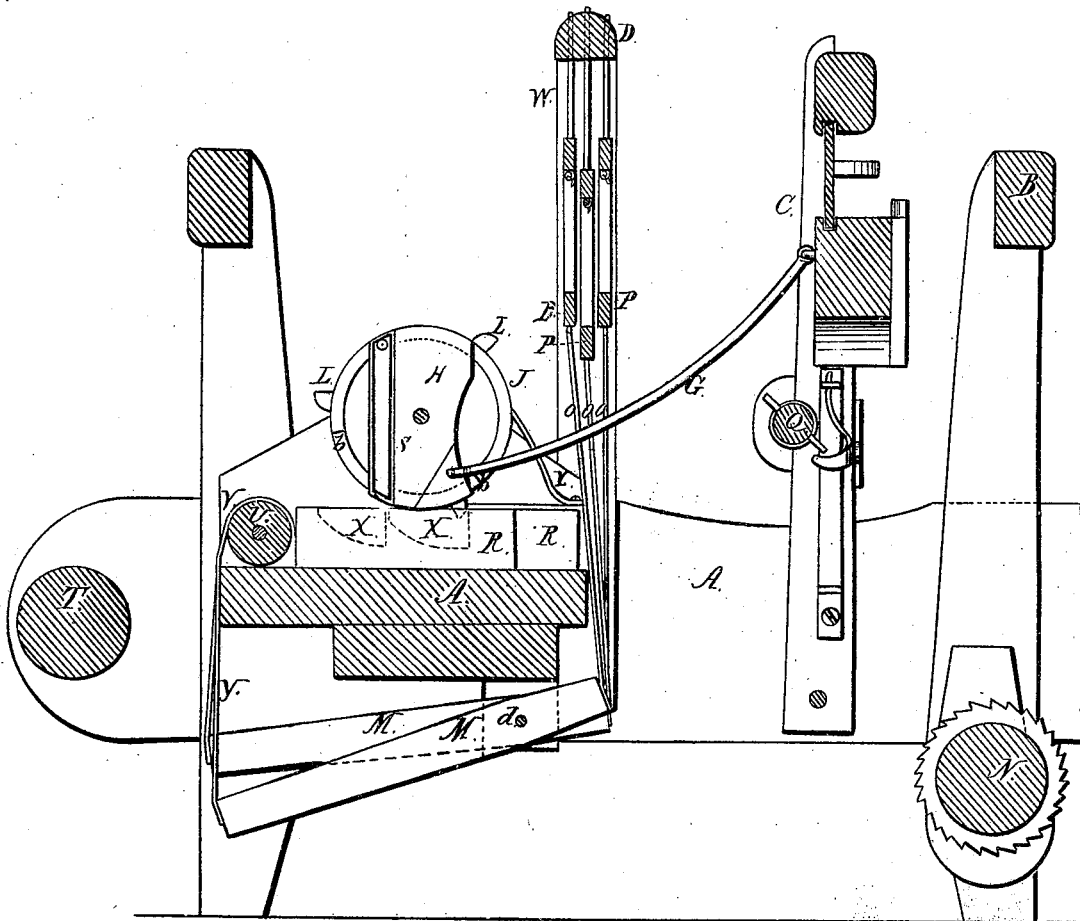
Sheet 3-4 Sheets.

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Patented May 8, 1866.

Fig. 3.



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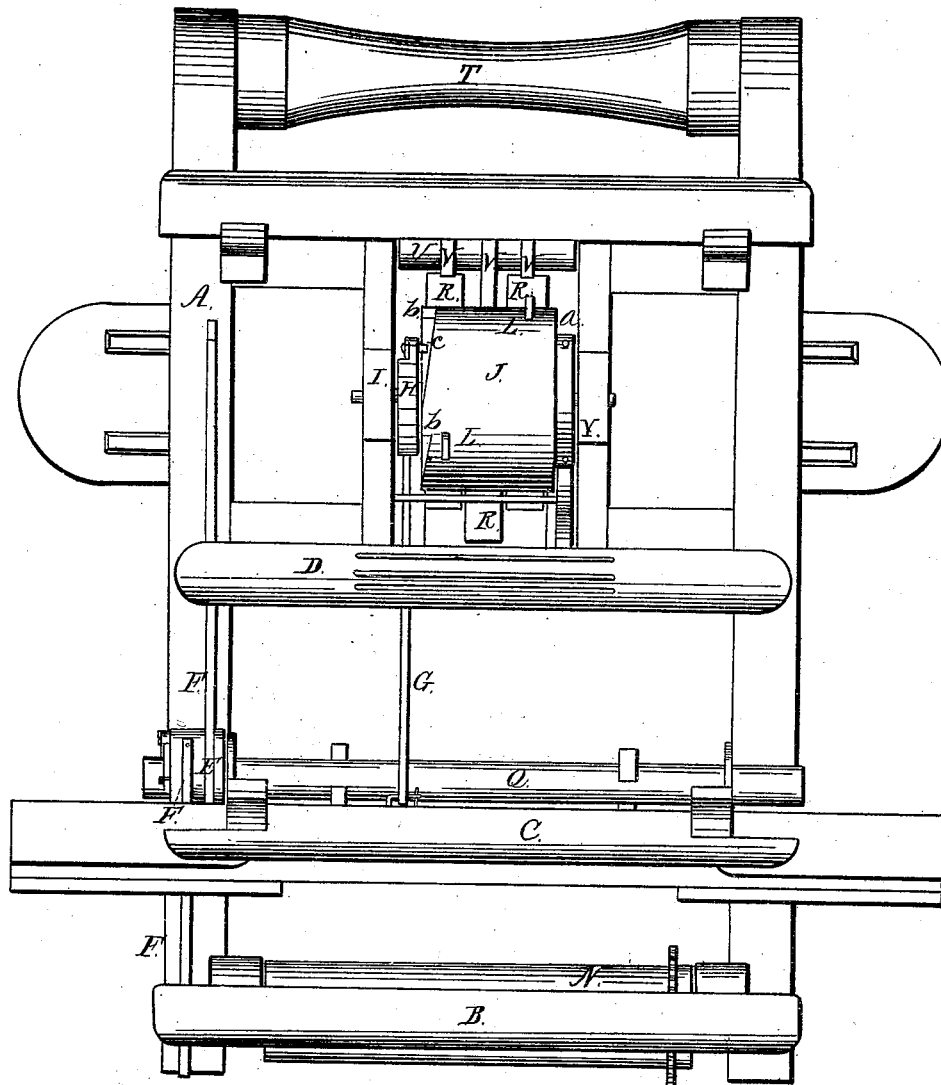
Carter & Snake. Hand Loom.

Sheet 4-4 Sheet 5.

N^o 54,501.

Patented May 8, 1866.

Fig: 4.



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UNITED STATES PATENT OFFICE.

A. CARTER AND R. SPAKE, OF SALEM, IOWA.

IMPROVEMENT IN HAND-LOOMS.

Specification forming part of Letters Patent No. 54,501, dated May 8, 1866.

To all whom it may concern:

Be it known that we, A. CARTER and R. SPAKE, of Salem, in the county of Henry and State of Iowa, have invented a new and useful Improvement in Hand-Power Looms; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet 1, is a side view of a loom made according to our invention. Fig. 2 is a front elevation. Fig. 3, Sheet 2, is a vertical longitudinal section. Fig. 4 is a plan.

Similar letters of reference indicate like parts.

This invention is meant chiefly to be applied to looms intended to be operated by hand through the lay, which looms are called "hand-power" looms because the other parts of the machine, or many of its parts, are moved automatically through their connection with the lay. The invention consists, among other things, in a novel mode of constructing and operating the treadle-shaft and the treadles which depress the heddles so as to form the shed at proper intervals of time. The shed is made at the forward movement of the lay, the treadle-shaft, through whose revolution the sheds are made, being turned by a pawl set on the axle of said shaft, which pawl engages ratchet-teeth formed on one end of the shaft and is moved backward and forward with the lay, thereby rotating the shaft the distance from one ratchet-tooth to another, and opening the shed in the warp.

The letter A designates the frame of a loom whose warp-beam T, cloth-beam N, and breast-beam B are made after the usual manner.

C designates the lay, which is vibrated back and forth by the hand of the operator in the usual way. It is made in the ordinary way, with a shuttle-race and reed-board, and has also a shaft, Q, which, by proper devices, is made to rock and operate the picker-staff. (Not shown.)

D is the frame which supports the heddles, whose shafts P are suspended from the top of the frame by elastic cords W; but weighted cords may be used instead, the object in using elastic or weighted cords being to lift up and restore the heddles to their first position so

soon as they are released by the treadles. Each heddle-shaft is connected by a cord, O, to the forward end of its appropriate treadle M, the rear ends of the treadles being severally connected by cords V to the rear ends of slides R, said cords V passing over an anti-friction roller, U. The slides R and treadles M are as numerous as the heddles, each heddle having its appropriate slide and treadle. The slides R are placed side by side above the treadles, and their upper sides have angular depressions X, which receive the pins L of the treadle-shaft J. This shaft is placed over the slides, and has as many pins or cogs projecting from its periphery as are required for operating the heddles. The pins are set at such intervals apart as will allow the movements of the several heddles to take place in proper relation to each other so that the sheds will be formed in due order. The treadle-shaft has bearings in standards I, or it may have its bearings in the sides of the frame of the loom. A spring, Y, which bears on a reduced portion of the shaft at its right-hand end, observing Fig. 4, serves to produce friction on the shaft and prevent it from rotating too freely; and stops *a* are set in such reduced part of the treadle-shaft to prevent it from rotating backward, the end of the spring, after it has passed any one of the stops, taking its position in front thereof and performing the office of a detent. The left-hand end of the shaft, observing Fig. 4, has several ratchet-teeth, *b*, formed on it, the number corresponding with the number of pins L.

H is a pawl vibrating on the axle of the shaft and operated by a rod, G, which is attached to one end of the pawl and to the lay of the loom. A rabbet is made on the rear side of the pawl H, to form a place for a spring, S, whose upper end carries a pin, *c*, which projects through the pawl and engages with the ratchet-teeth *b*, and so causes the shaft to be rotated intermittently, the pin being pushed back by coming against the inclined side of the teeth when the pawl is swung forward to take a fresh tooth.

The operation of the mechanism is as follows: When the lay is pushed backward the pawl H is rotated so as to bring its pin *c* forward of one of the side ratchet-teeth, *b*, of the shaft. The lay being in the next place pulled forward to beat up the web, the pawl is rotated

in a contrary direction, and the pin *c* coming against that tooth *b* which is behind it, causes the shaft to travel with the pawl. This movement of the shaft brings one of its pins *L* against the square end of one of the slots or cavities of that slide *R* which is in the path of such pin, and moves the slide forward, and so, through its strap *V*, raises the rear end of one of the treadles *M*, whose forward end, being thereby depressed, brings down one of the heddles. When the next forward movement of the lay takes place the pin *L* which last engaged a slide, *R*, is drawn out of engagement with such slide, which thereupon is drawn back to its normal position by means of the elastic straps *W*, acting through the cord *O*, treadle *M*, and cord *V*.

It will be observed from this construction that there is no restriction to the number of treadles which can be worked save the limit imposed by the length of the treadle-shaft; in a loom of ordinary size about forty treadles might be operated from the same shaft. The shaft makes only one revolution for the whole number of treadles, while the lay is moved backward and then forward for each depression of the treadles, as, for instance, having three

treadles in the loom, in working all of them the shaft will turn once and the lay will make three reciprocations.

One of the advantages of our invention is that we are thereby enabled to weave any kind of cloth upon a hand-power loom, from simple to complicated patterns, so far as the warp is concerned. The leverage of the treadles is arranged so as to favor the operator, who moves the lay to and fro by hand, their center of motion being on the pivot *d*, near to their forward ends.

We claim as new and desire to secure by Letters Patent—

1. In hand-power looms, operating the treadles through a system of slides, *R*, which are moved by pins or cogs on the treadle-shaft *J*, substantially as described.

2. The combination of the rod *G*, which extends from the lay, the pawl *H*, the shaft *J*, armed with pins or cogs *L*, and the slides *R*, substantially as shown and described.

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