3 Sheets—Sheet 1.

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GIMP-LOOM.

No. 189,515. Patented April 10, 1877.

Fig. 4.

Fig. 3. *Fig. 2.*

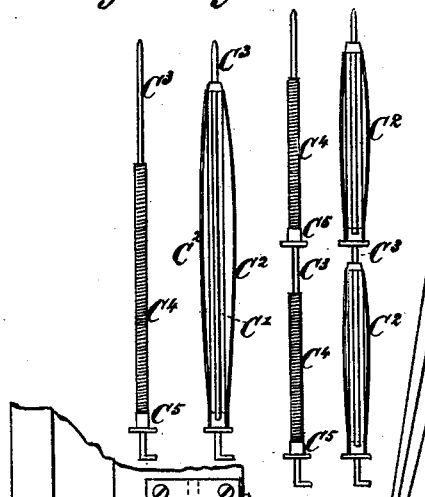
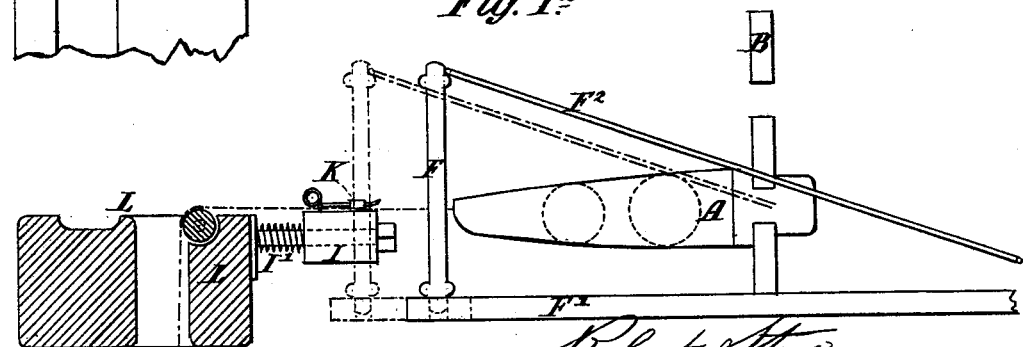


Fig. 1.

Fig. 1ª



Witnesses
John Becker
Fred Haynes

Robert Stone
by his Attorneys
Brown & Allen

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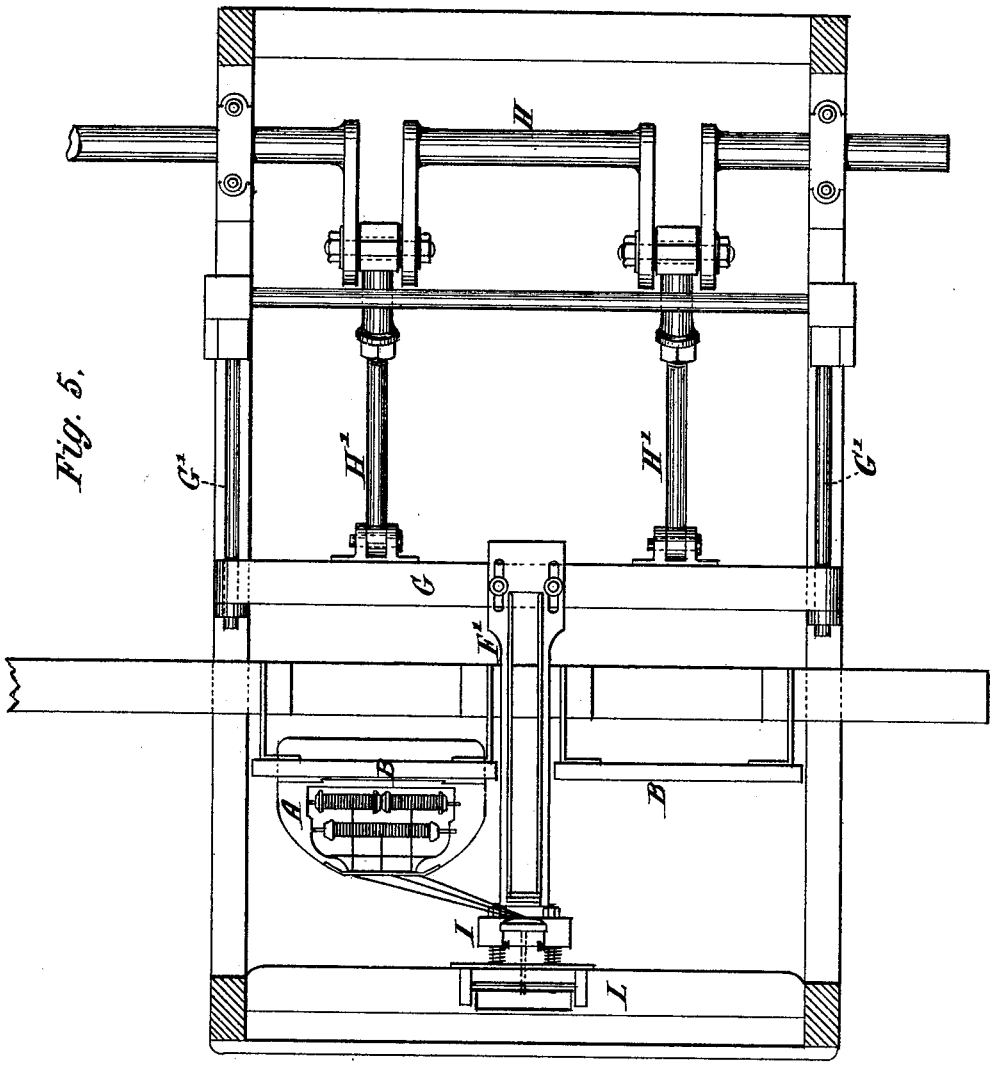
Fig. 5.



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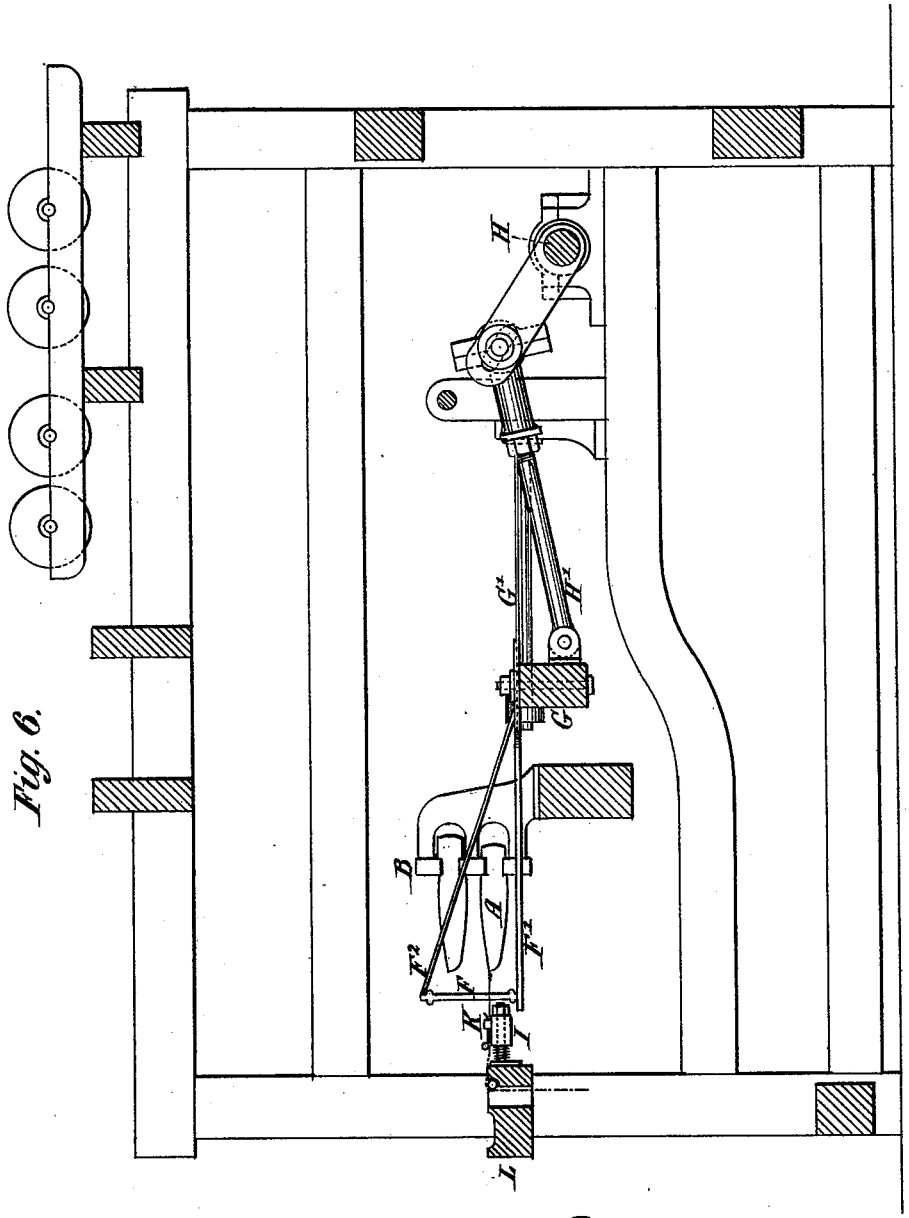

Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT STONE, OF COVENTRY, ENGLAND.

IMPROVEMENT IN GIMP-LOOMS.

Specification forming part of Letters Patent No. 189,515, dated April 10, 1877; application filed August 31, 1876

To all whom it may concern:

Be it known that I, ROBERT STONE, formerly of Derby, in the county of Derby, but now of the city of Coventry, in the county of Warwick, England, weaver, have invented certain Improvements in Gimp-Looms, of which the following is a specification:

The object of this invention is so to construct gimp-looms as to enable them to work automatically. In the looms, as at present constructed, the assistance of the workman is constantly required to keep the gimp-threads at tension as they are delivered from the shuttle, and also to insure the proper shaping of the loops or scrolls formed by the gimp-threads.

My first improvement relates to the shuttle-bobbins.

Instead of winding the gimp-threads of each shuttle upon one shuttle-bobbin, as is usual, I provide for each gimp-thread a peculiar arrangement of bobbin will give off the required amount of thread at each throw of the shuttle, and wind up any slack that may remain unused. Supposing three bobbins are required for the shuttle, two to carry gimp-threads, and a third and larger bobbin to carry a spiral thread or cord, I mount the two smaller bobbins on the same pin-wire, to which I fit two helical springs. Over each of these springs I place a tube, which is to receive a bobbin, and the coiled springs I so connect with their inclosing-tubes, that while yielding to any axial drag on the tubes, they will be free to reverse the rotary motion of the tubes when the drag is removed. Externally of these tubes I fit, say, four flat springs, which are arranged longitudinally of the tube, and are secured thereto so as to form retaining-springs to the bobbin. These springs, by having a curve outward, will bind against the inner periphery of the bobbin, and yet yield to allow of its being placed on the tube or withdrawn therefrom. The largest bobbin will be similarly fitted, but alone upon its pin-wire.

In the accompanying drawings, Figure 1 shows, in plan view at A A, one of a pair of shuttles fitted according to my invention for weaving a piece of gimp, such shuttles being worked alternately. The other parts of this figure will be hereafter referred to when describing the construction of the loom. The shuttles work in a fixed race, B, which is made independent of the motions of the batten in order to prevent the gimp-threads overriding each other, which is liable to take place on the advance of the shuttles to the breast-beam. The shuttle A is shown as fitted with three bobbins, C D E; but it may be fitted with two front and two back bobbins, if thought desirable.

The contrivance for holding in place the front bobbin C, which carries the spiral thread, is shown at Fig. 2, and consists of a tube, C^1, which is furnished with four flat bow-springs, C^2. These springs are secured to the tube at one end, their opposite ends being free to allow of the springs yielding to receive the bobbin when pushed endwise onto the tube, and of holding it securely in place; or, the said springs may be secured at their centers to the said tube, leaving both ends of each spring free to receive the bobbin. Through the tube C^1 is passed a pin-wire, C^3, (shown detached at Fig. 3,) one end of which is crooked to fit into a notch in the shuttle and prevent its turning therein. Surrounding this pin-wire is a helical spring, C^4, one end of which is made fast to the wire, and the other to a bush, C^5, which is loose on the wire, and is intended to fit into one end of the tube C^1 with sufficient closeness to cause the latter to coil up the spring C^4. The opposite end of this tube is formed with a socket to receive the straight end of the pin-wire. The back bobbins D and E, which carry the gimp-threads, are mounted on similar tubes; but these are both fitted to the same pin-wire, as shown in the detached views, Figs. 4. In other respects the fitting up of these bobbins is similar to that of the bobbin C above described.

The threads of the several bobbins are drawn through separate eyes in the shuttle, as shown at Fig. 1. The working of the shuttles will be after the manner common to small-ware looms.

By the mode of mounting and fitting the bobbins, above described, it will be readily understood that they will be free to give off their several threads, the helical springs C

yielding to allow of their turning on the pin-wires, and the bow-springs yielding to admit of their turning independently of the tubes; but if any slack is produced it will be instantly taken up by the recoil of the helical springs, which form an elastic connection between the fixed pin-wires and their respective tubes C^1.

In this operation the bush C^5 allows the tube C^1 to turn upon the spring C^4, after the latter has coiled tight about the pin-wire C^3. This provides an additional protection against the breaking of the spring by the unwinding of the bobbin.

My invention relates, secondly, to improvements in the construction of the loom itself. These improvements are shown in the partial plan view, Fig. 5, and in the partial sectional elevation, Fig. 6, which figures show also the mechanism for working the batten. In these views the mechanism for producing one piece of work only is shown; but it will be understood that the loom may be made of any width within the capacity of the workman to attend. Fig. 1 and Fig. 1^a show the improved mechanism in plan and sectional elevation at half size with the gimp in course of manufacture. In these figures, B is the stationary shuttle-race carried by brackets attached to the main framing of the loom, as shown at Fig. 6. F is the reed, fitted upright on a horizontal frame, F^1, attached to a sliding bar or batten, G, Figs. 5 and 6. This batten slides upon fixed guide-rods G′, carried by the framing of the loom, and receives a to-and-fro motion from the throw of the crank-shaft H through the connecting-rods H′ H′. The reed-frame F^1 is formed with a socket at its front end to receive the reed, and the reed is held in a vertical position by an elastic strut or clip-piece, F^2, which is made fast to the reed-frame F^1, and yields to provide for the reed liberating itself and swinging back at its lower end when meeting with any obstruction in front of it during or at the time of beating up, and so preventing accident or breakage.

In front of the reed I provide a table, I, which serves as a support for the lower warp-threads of the open shed, and thereby facilitates the proper formation of the loops of the shuttle-threads, as will be presently explained. This table is fitted with a spring-presser, K, and is carried by pins I′, which project from a plate attached to the breast-beam L of the loom, and by means of coiled springs surrounding the pins, and inserted between the table and the said plate. The table is free to yield to the blow of the reed at the beat up, and return to its normal position. The threads, as they are laid in consecutive order in the open shed, are drawn under and held by the spring-presser K, whereby they are prevented from overriding each other and producing defective work. The work, as it is woven and beaten up, passes over the table I and under the spring-presser K, and thence to the work-roll. By the passage of the work under this spring-presser, and over the sliding table, as the work is wound onto the work-roll, the loops of gimp, as they are formed, will be automatically flattened as by the finger and thumb of the workman. The facilities for weaving thus provided enable me to drive the loom by power and to weave at one and the same time several pieces abreast of each other, a general superintendence only of the work being required from the attendant.

Having now set forth the nature of my invention and explained the manner of carrying the same into effect, I wish it to be understood that I claim—

1. The combination, with a gimp-loom shuttle, of two crooked pin-wires, C^3, (for each shuttle,) placed parallel to each other and longitudinally of the shuttle, such pin-wires being fitted with helical springs C^4 and bushes C^5, the same being inclosed in tubes C^1, having attached to their exterior retaining-springs C^2 for holding three or more bobbins in place in the shuttle, such arrangement being designed to maintain the tension of the several weft-threads, while providing for unequal rates of delivery during the throw of the shuttle.

2. The combination of the socketed reed-frame F^1, the self-liberating reed F, and the elastic strut or clip-piece F^2, substantially as and for the purpose above described.

3. The combination of the yielding table I and its return springs, with the spring-presser K and the reed F, for automatically bringing the loops of gimp to shape, as the beating up takes place, and the work is wound upon the work-roll, essentially as described.

Dated the 26th day of May, 1876.

ROBERT STONE.

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