

J. H. HIGGINS.
Warp-Setting Frame.

No. 134,057

Patented Dec. 17, 1872.

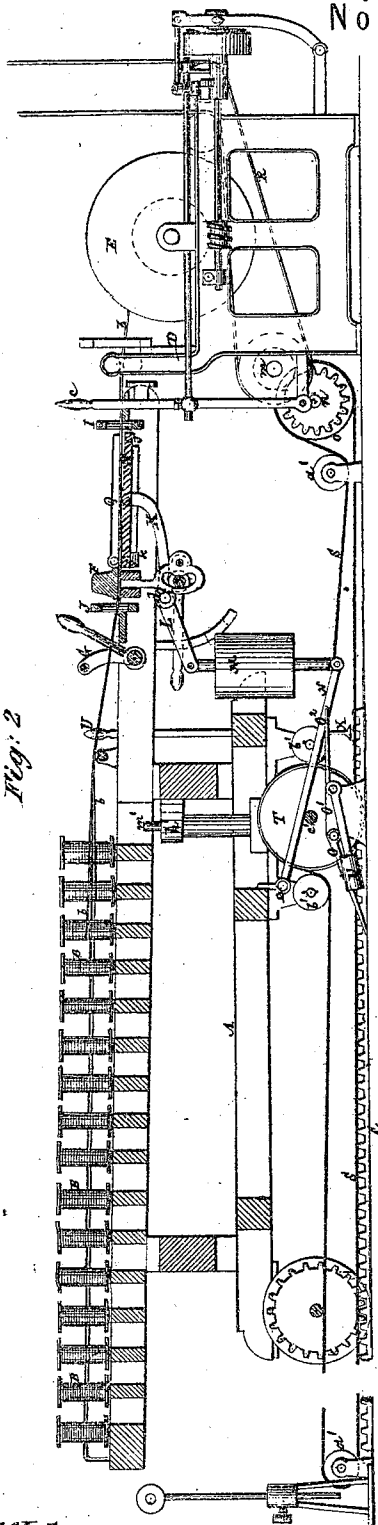


Fig. 2

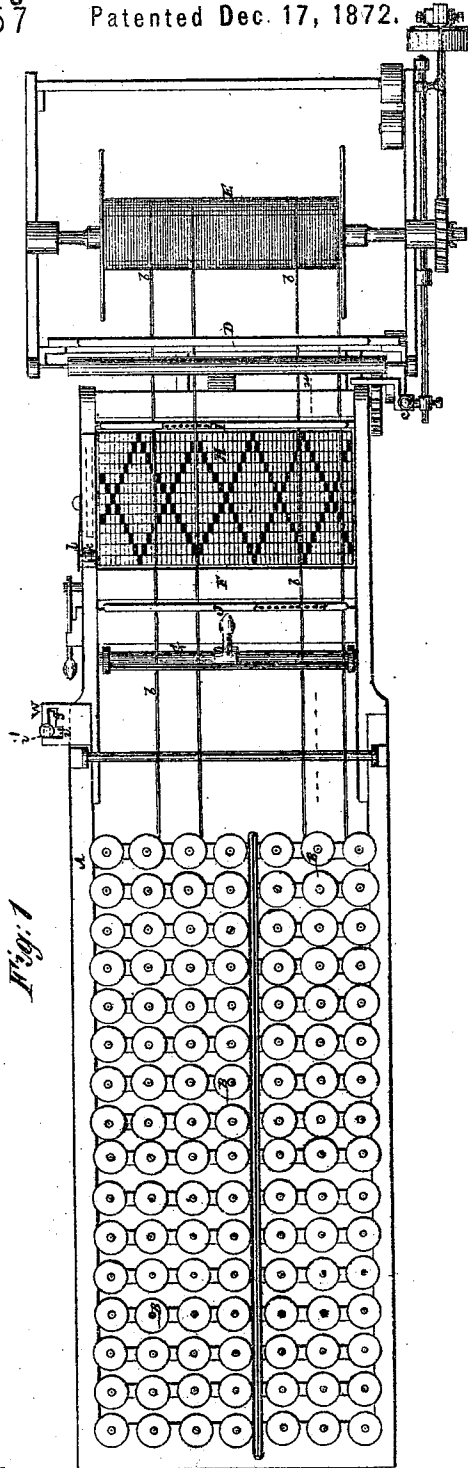


Fig. 1

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Fig: 3

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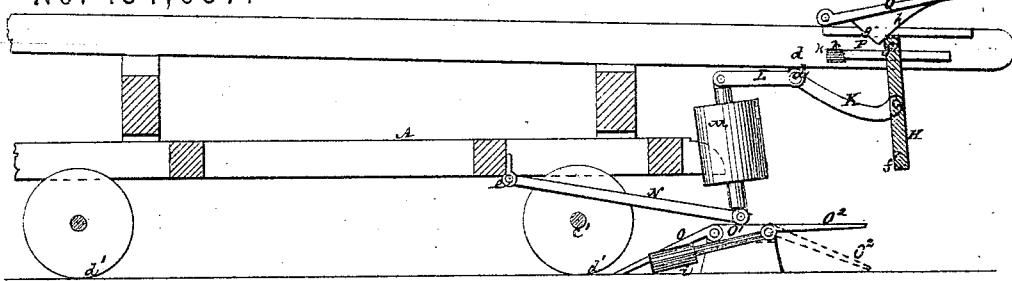


Fig: 8



Fig: 4

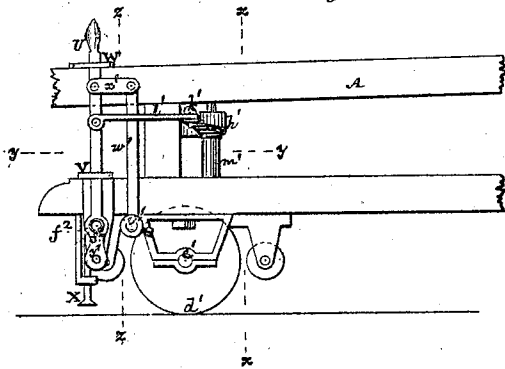


Fig: 6

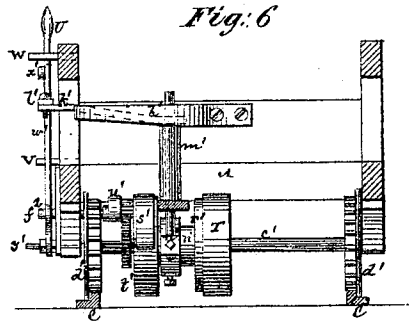


Fig: 5

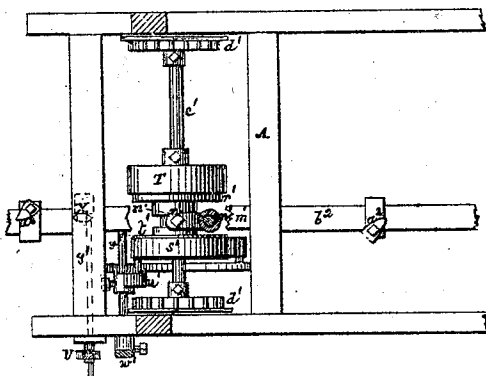


Fig: 7

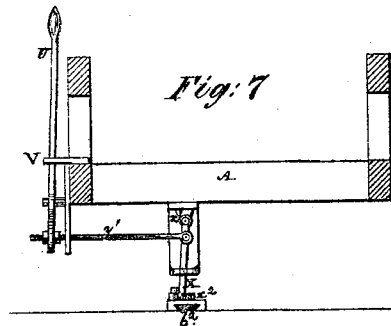


Fig: 9



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UNITED STATES PATENT OFFICE.

JOHN H. HIGGINS, OF NEW YORK, N. Y.

IMPROVEMENT IN WARP-SETTING FRAMES.

Specification forming part of Letters Patent No. 134,057, dated December 17, 1872.

To all whom it may concern:

Be it known that I, JOHN H. HIGGINS, of the city, county, and State of New York, have invented certain new and useful Improvements in Frames for Setting Carpet-Yarns and other purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a plan of a frame for setting carpet-yarns having my invention applied; Fig. 2, a mainly sectional vertical longitudinal view of the same, the section being taken at the line *w w*; Fig. 3, a partial side view in illustration of devices for revolving or reversing the setting-table; Fig. 4, a further opposite side view, in part, in illustration of an automatic stop-motion used to control the lengths of the stretches of yarn to be set; Fig. 5, a horizontal section at the line *y y*; Fig. 6, a transverse section at the line *x x*; Fig. 7, a further transverse section at the line *z z*; and Figs. 8 and 9, plan views of certain details relating to said stop-motion.

Similar letters of reference indicate corresponding parts throughout the several figures of the drawing.

My invention is more especially designed to be applied to the setting of printed or variously-colored yarns or warps such as are used in the manufacture of tapestry Brussels carpets, and will here be described in such connection.

To better explain the object and nature of my invention a brief reference will first be made to the state of the art prior to my invention, which latter generally consists in sundry novel combinations of devices involving a new or different mode of procedure or process to that previously practiced for accomplishing the work above mentioned, and whereby said work may be done more expeditiously, economically, and perfectly.

The setting of such yarns has heretofore been very difficult, requiring much practice and highly-skilled labor. Thus, according to the method previously practiced, the setters have had no other guide than a wooden table of about two feet eight inches wide transversely of the setting-frame, and about one foot six inches in direction of the length of said frame. This table was ruled with lines at about half

of an inch apart in width only of the frame, or, say, fifty-four lines in number, and the frame was provided with one reed back of the setting-table to keep the threads from crossing each other during the process of setting. To set the yarns it has been customary to use two or more setting-boards having a portion or portions of the design to be set painted upon them. These boards are much smaller than the setting-table, being usually about eighteen inches in the one direction, corresponding to the width of the frame, by but a little over four and one-half inches in the other direction, and are ruled, having the design corresponding in number of lines in the width to the number of threads to be set, and corresponding in the number of lines in the length to the proportionate length of color on each thread. In this way the width, relatively to the frame, of eighteen inches of a design-board by a trifle over four and one-half inches in the other direction, or, rather, the design thereon has to be spread over a setting-table two feet eight inches in the one direction by one foot six inches in the other. This is difficult, as the setters, drawing the yarn to the most convenient place on the setting-table, first read the design right and left from the center lines, then place the yarns in the same relation on the setting-table, and following, thread by thread, till they meet in the center of the table. Under this method the setting-board is the chief guide while an operator is learning a pattern, and memory afterward; and as changes of patterns occur very often much time is lost and imperfect work produced, especially when there are two setting places.

My invention dispenses with the independent setting-boards, the design, full size, being on the setting-table itself, under the yarns, and there being two sets of reeds to guide the yarn directly over the same colors on the design as are printed on the yarn; or, in other words, over the corresponding lines and colors of the design, the one set of said reeds being stationed in front of the setting-table and the other in rear of the latter and behind the usual clamp which holds down on the yarns when the carriage of the setting-frame is moving forward. Thus no learning of a design is required, nor any dependence upon memory, for the production of good work, and

skilled labor will answer. The invention also consists in a reversible or revolving setting-table having designs upon both its faces, whereby provision is made for working from different designs to complete or vary the pattern each succeeding stretch of the yarns. The invention likewise consists in mechanism for automatically revolving or reversing said table; also, in means for stopping the carriage of the frame by a self-acting motion at either one or two different places, alternately, to control the lengths of the stretches of yarn to be set.

Referring to the accompanying drawing, A represents the carriage of a carpet-yarn setting-frame, mounted with any required number of spools, B, having the printed or variously-colored yarns *b* on them. This carriage, in its general construction and operation, does not differ materially from others in common use, the same running to and fro on tracks C C relatively to the stationary head D, which carries the take-up or beam E, and which does not vary essentially from the heads of other setting-frames, and is provided with the usual or any suitable stop mechanism for automatically arresting the motion of the beam when the carriage is run up to the head, said stop-motion being released by hand applied to the lever *c*, when it is required to start the beam again. The usual means should also be provided for arresting the motion of the beam by hand in case of the breakage of a thread or any irregularity occurring in the work. F is the usual clamp for holding on the yarns when the carriage is drawn forward, and for putting tension on the threads when drawing the latter from the spools. G is the yarn-tightener for taking up any remaining slack after the carriage is run back. H is the setting-table, having the design painted full size upon it, or rather upon a facing of metal, wood, paper, or other suitable material, secured in a removable manner to the table, as, for instance, by a screw or screws, which, passing through the table, may serve to hold duplicate facings—that is, one on each side of the table—for working different patterns or half patterns from the same table by revolving or reversing it, as will be hereinafter described.

No further reference, however, need yet be made to the reversal of the table, as such feature might be dispensed with. But an important element in connection with the setting-table having the design full size upon it, whether said table be reversible or not, consists in an arrangement of two reeds or sets of reeds, I J, the one of which is placed in front of the table and the other in rear of it behind the clamp F, to guide the yarns directly over the corresponding lines and colors of the design.

In the operation of the setting-frame the yarns are brought to within one or two inches of the setting-place on the table H, and the setters then proceed to set the yarns to the design on the setting-table, by commencing on the sides of the whole series of threads to draw

forward the same to their proper places on the design. This may be accomplished by a single operator, and as the design is always in place on the setting-table at the commencement of a pattern, and remains there through the entire pattern, no learning of a design is required; consequently no time is lost, nor any dependence necessary upon memory, for the production of good work. Moreover, by this process the most difficult patterns may be easily and perfectly set, which cannot be done on or by the old setting-frame.

I will now describe the setting-table H when constructed so as to be reversed. This is used in such patterns as require two setting-places, when two designs are used, one on each side of the table, the latter being made to revolve so as to present to view the designs alternately. The setting-table H, having the two designs upon it, one on each side, is pivoted at each of its ends midway of the latter to an arm, K, of or from a rock-shaft, *d*, which has fast to it an intermediate arm, L, that may be slotted to provide for adjustment of a weight, M, applied to said arm, and attached below to the free end of a rod, N, which is pivoted at *e* to the frame of the carriage. Said weight, when down, serves to keep the setting-table to its place, either face uppermost. As the carriage A, however, makes its advance stroke—that is, while the yarn is being rolled on the beam E—the weight M is first lifted by traveling up a hinged incline, O, onto a level or plane, O¹. This lifting of the weight and operation of the arms L and K causes the table H to find its bearing or fulcrum by a rear end pin, *f*, or *f*¹, according to which side of the table is uppermost, within a guide, P, and makes the table to partly revolve on its central pivots. During this action the same pin *f* or *f*¹, or a projection on the opposite end of the table corresponding thereto, acts under the rear portion *g* of a hinged double incline, Q, and lifts the latter, which then operates as a weight by its front inclined portion *h*, on the pin or end projection of the table last referred to, in such manner that it completes the turning or reversal of the table H, while the weight M, by the continued forward motion of the carriage, travels over the plane O¹, and over and down a hinged piece, O², forming an incline, but held up by a weight, *i*, to prevent the weight M, as it descends, from slamming the table H at the close of the latter's reversal, said weight *i* also operating to hold the hinged piece O² raised after the weight M has ceased to depress it, so that when the carriage A makes its back stroke the lower acting portion, which may be a side roller of the weight M, will pass under the hinged piece or weighted incline O², the plane O¹, and hinged opposite incline O. To allow of the pin *f* or *f*¹, which occupied an advance position prior to the turning of the table, taking its rear position within the guide P at the close of the reversal of the table, and so that it will be ready to bear down on the

guide at the commencement of the next reversal of the table, the rear end k , Figs. 1 and 3, of the lower rail of said guide P is made inclined from beneath, and movable laterally under the control of a spring, l , thus admitting of the pin f or f^1 entering the rear end of the guide from beneath, but not allowing of its passing down again out of said end of the guide. In this way or by these means an intermittent revolving motion equal to half of a circle at a time is communicated to the setting-table H , each forward movement of the carriage thereby alternately reversing the faces of the table and designs painted on them for the purpose or purposes herein previously mentioned. Of course other means may be used for reversing the table.

R is the belt by which motion is given to a counter-shaft, m , carried by the head D for communicating to the carriage A its back travel, said counter-shaft gearing with a secondary shaft, n , on which is a pulley, o , that sets the carriage A in motion by a belt, S . This belt S passes under and round fixed guide-pulleys $a^1 a^1$, and under and over pulleys $b^1 b^1$ and T connected with the carriage in such manner that it clips a large portion of the periphery of the pulley T . This pulley is fast on one of the axles c' of the carriage, having one pair of the running or propelling wheels d' secured to it. To stop the carriage at any desired point in its back run, or alternately at any two required places to suit the lengths of the stretches of yarn to be set, an automatic stop-motion is applied to the carriage, which motion may be constructed as follows: U is a hand-lever on one side of the carriage, working on a free fulcrum at f^2 , whereby said lever is not only capable of being moved to and fro in direction of the length of the carriage along a lower guide, V , and a slot, g' , in an upper guide, W , on the frame of the carriage, but is also capable, when thrown back against the pressure of a spring, h' , of being adjusted laterally into one or other of two holding notches, $i' i'$, at the back end of the slot g' . Connected with the lever U , by an arm, k' , and rod l' , is a vertical shaft, m' , having a toe or clip, n' , that, when the lever U is in lock with either one of the notches i' , releases a friction-disk, r' , from hold on the pulley T , also releases a second brake or friction strap, s' , from a brake-wheel, t' , on the same axle c' , said brake or friction strap being operated by an arm, w' , on a rock-shaft, v' , connected with the lever U by an arm, w' , and link x' . When, however, the lever U is moved out of either notch i' , then the spring h' throws the lever forward, and causes the friction-disk r' to bear against the pulley T , also the brake s' to hold on the wheel t' , thus arresting the motion of the carriage. This is done automatically when required in either or both directions of the trav-

el of the carriage, at any desired point or points, by means of a hinged or pendent shifter, X , pivoted at x' to the under side of the carriage, and connected with the lower end of the lever U by a rod, y' , arranged transversely of the carriage, so that on drawing back the lever U and adjusting it laterally into either one of the notches $i' i'$ the shifter X will be correspondingly tipped to the one side or the other, whereby, when the carriage A reaches a given point in either direction, said shifter comes in contact with one or other of two cams or fixed stops, $a^2 a^2$, and the shifter being thereby pressed or turned to one side, the lever U is released from its holding-notch i' , so that the spring h' is at liberty to throw the lever U back, and apply the brake or brakes to arrest the motion of the carriage. The cams $a^2 a^2$ are made adjustable along a longitudinally-arranged bar, b^2 , to vary the points at which the carriage is to be arrested, and are set in reverse directions relatively to each other and on reverse sides of the bar, to insure their action on or against opposite sides of the shifter X , so as to release the lever U from either one of the two notches $i' i'$, alternately, in conformity with the direction in travel of the carriage. When the brakes, one or more, (two, including the friction-disk r' , having been here described) are applied to hold the pulley T and the axle carrying it from turning, then the belt S slips on said pulley. In some cases but a single cam or stop, a^2 , and a single lever-holding notch, i' , may be used to automatically arrest the motion of the carriage in the one direction.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The setting-table H , having the design or designs painted or arranged upon one or both of its faces, when the same is combined with duplicate reeds $I J$, arranged the one in front of the table and the other in rear of it, and behind the clamp F , essentially as described.

2. The intermittently-revolving or reversible setting-table H , having the design or designs upon both of its faces, in combination with mechanism for automatically changing its side or face uppermost while the yarn is being rolled on the beam of the setting-frame, substantially as specified.

3. The combination, with the carriage A , of an automatic stop-motion, substantially as described, put in action by the carriage at any desired point or points, alternately, in the travel of the latter, to determine the lengths of the stretches of yarn to be set, as specified.

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