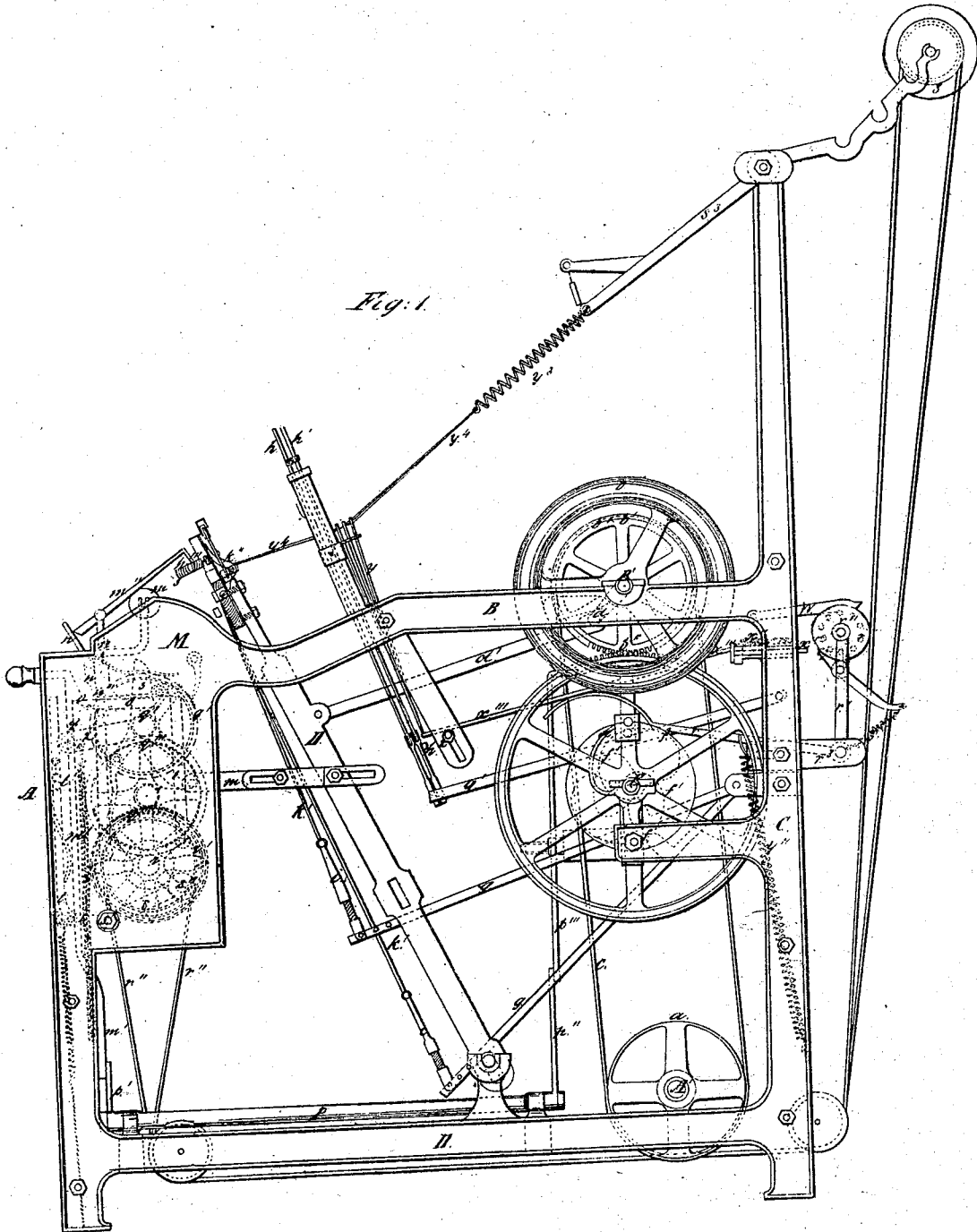


C. Ganahl.

Ribbon Loom.

N^o 4,782.

Patented Oct. 3, 1846.



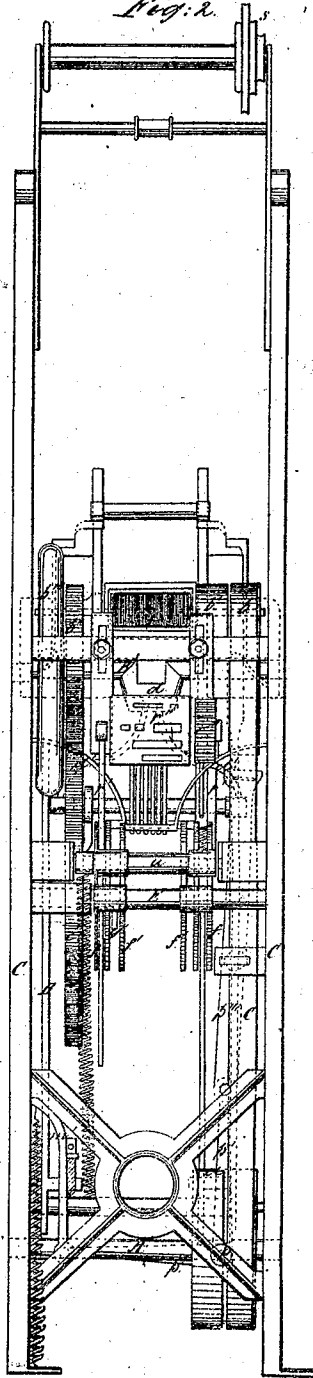
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Fig. 2.

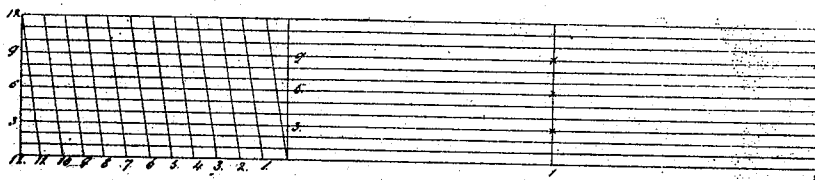
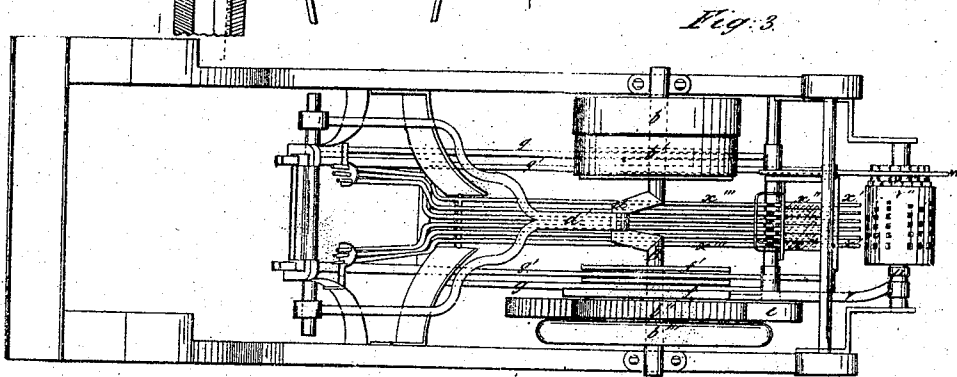
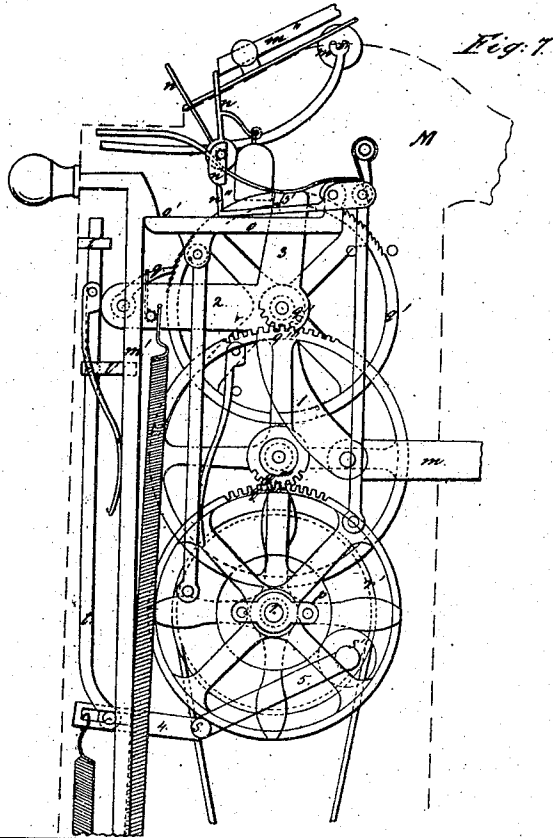


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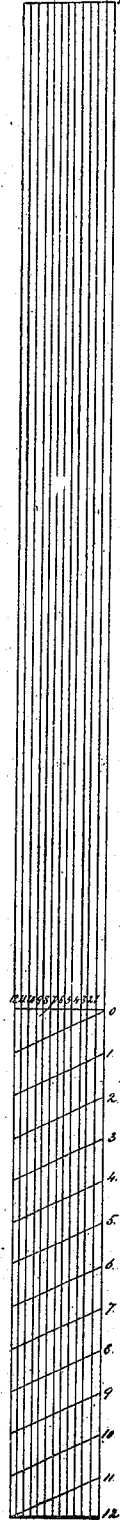
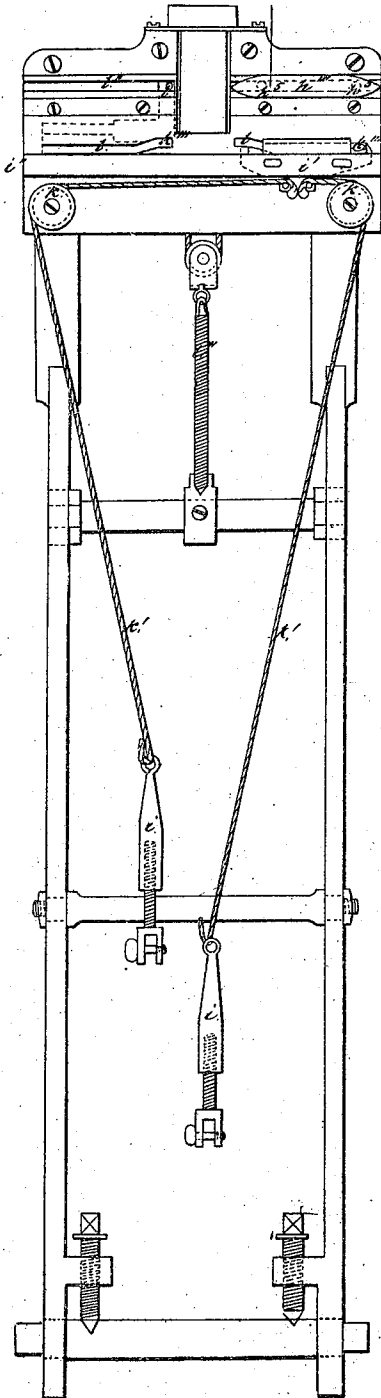
Sheet 4, 5 Sheets.

Ribbon Loom.

N^o 4,782.

Patented Oct. 3, 1846.

Fig. 4.



UNITED STATES PATENT OFFICE.

CARL v. GANAHL, OF INNSBRUCK, AUSTRIA.

RIBBON-LOOM.

Specification of Letters Patent No. 4,782, dated October 3, 1846.

To all whom it may concern:

Be it known that I, CARL v. GANAHL, of Innsbruck, in the Empire of Austria, have invented a new and useful Improvement in Looms for Weaving Ribbons and other Narrow Stuffs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

No. 1, is a side elevation of the loom; No. 2, a back elevation; No. 3, a top plan; Nos. 4, 5, and 6, front, side, and back views of the lathe; No. 7, the stop and regulator detached.

The nature of my invention consists in constructing a loom for weaving ribbons and other narrow goods, which can be driven with great rapidity by steam, or other power, requiring only one person to tend from 20 to 50 stands, all of which are driven by one axle, as there is a regulator and stop attached to each stand.

The frame of the loom may be made of cast iron, the sides being cast as is shown at No. 1, A, B, C, D, somewhat similar to common loom frames; the back uprights are about twice the height of the front ones, which latter only extend up to the breast beam.

A' is the main shaft, having its bearings on the lower side girths D, near the back of the frame; it receives its motion from the driving power in the usual way; on this shaft are pulleys (a) to connect it with each ribbon stand, of which there may be any number driven in connection; the motion is communicated by means of a belt (c) to a pulley (b) on a shaft B', resting in bearings in the top girth of the frame, over the shaft A', and parallel with it; there is a loose pulley (b') also, on the shaft B' for shifting the belt (c) onto, to stop the loom. In the middle of the last named shaft, there is a sunk-crank which serves to vibrate the lathe; and on the end opposite the pulleys (b, b') is affixed a spur-wheel (b'') and a fly-wheel (b'''). The spur-wheel (b''), works into a spur-wheel (e) about twice its diameter on the shaft E; this shaft is situated directly under B', and is supported on arms projecting forward horizontally from the back uprights of the frame, about half way between the upper and lower side girths; on this shaft are placed cams (f'),

(shown by dotted lines in No. 1,) which move the treadles (g') connected with the harness (h h'); on the same shaft are also two other cams (f) for throwing the shuttle as hereafter described.

The Nos. 4, 5, and 6, on the drawings, represent the front, side, and back, of the lathe; the swords are of the usual form, except being adjustable on the rocker (z) by means of screws (z'); they are connected by cross ties (z''), and have a flat metal plate (D, No. 6) screwed to their upper ends, to which the reed, pickers, &c., are attached. At the center of this plate, a rectangular piece is cut out from the upper edge, large enough to admit the reed—there are also, two horizontal slots (l'') made in the plate, on each side of the reed, about its center; below these are two other slots (l), also horizontal, except near their inner ends, which slant up toward the reed as shown in No. 4: for a purpose hereafter mentioned, above and below the slot (l'') there are pieces of metal affixed on the front side of the plate, which form the race for the shuttle (h'''); the shuttle has a groove in it above, and below, into which ribs (h⁴) on the race pieces fit, (see No. 5). At the back of the plate (D) a rod (l''') see No. 6 is supported at its ends by brackets affixed to the plate, on a line with the lower, horizontal slots (l); on this rod two collars (k³) slide, from each of which an arm (k'') extends up to the upper slots (l'') bearing on its end a pin (l') that projects through the slot as shown by dotted lines in No. 5; there is also a horizontal arm (h''') (represented by dotted lines in No. 5, and having its end shown in No. 4,) projecting from each collar, which runs in the lower slot (l); these form the pickers or shuttle carriers; a cord (l⁵) is attached by its ends to the pickers, from thence it crosses over a pulley at the center of the plate (D No. 6,) and passes down around another pulley which is attached to, and drawn down by, a spring (l''') fastened to the upper cross tie (z''); this serves to draw the pickers (k'') toward the center, when they are not pushed back, as will now be described.

The cams (f), above named (two in number) are heart shaped, and made to act on two treadles (g), the fulcrums of which are between the back uprights; these treadles project forward, a little inclined downward,

and extend beyond the swords of the lathe; at the front ends, adjusting shackles (*i*) are connected, to which cords (*h'*) are attached; these pass up over pulleys (*K*) on each end of the race beam, and are attached to the slide (*i'*), which is made to move to and fro in a horizontal line, by the alternate up and down motion of the levers (*g*); the slide being guided and kept in place by a bar (*i''*) attached to the front of the lathe, just below the slots (*l*). The slide (*i'*) is a flat plate of metal, the upper edge of which is above the highest part of the slot (*l*); at each end there is a notch cut down into it vertically, large enough to receive the end of the horizontal arm (*h'''*), which runs through the slot (*l*) far enough for that purpose; the lip on the outside of the notch above named, is cut off, so as to be on a line with the lower edge of the most elevated part of the slots (*l*); the length of the slide between the notches, is just the same, as the distance between two holes, which are made, one in each end of the shuttle as shown by dotted lines at *h^s* No. 4, on the side next the plate (*D*), into which the pins (*l'*) on the pickers enter, and by which, the shuttle is driven.

When either of the pickers is up to the reed, the lower arm (*h'''*) follows the inclination of slot (*l*) and is thus by a sort of bell-crank motion elevated, so as to disconnect it from the slide (*i'*); this withdraws the pin (*l'*) on the vertical arm (*h''*) of the picker, and frees the shuttle on that side, just before this picker is brought up to a state of rest, the other one starts, and as the horizontal arm (*h'''*) descends, the inclined part of the slot (*l*), the pin on the upright arm (*h''*) on that side, projects forward, and enters the hole in the shuttle on the side next the slot (*l'*), and draws it out; in returning, this picker carries the shuttle to the point it received it from, and the first named one connects with it, and performs a similar operation: the shuttle is thus kept in a continued reciprocal motion, never being entirely disengaged from one picker, before it is connected with the other.

The take up motion is constructed and operates as follows: On a stud in the front upper part of the frame at *M*, which is widened at that part, for holding the parts now to be described, is a three pronged lever (shown in No. 7, in which the frame is represented in red outlines) figured 1, 2, 3; the lower prong 1, curves backward, and has attached to it the coupling bar (*m*) that connects it with the sword of the lathe which gives it its forward motion. The arm 2, extends forward horizontally, and carries a pawl (*q*), at its forward end, this takes into the teeth of a ratchet wheel (*q'*), which turns on the same stud as the lever. The arm 3, stands up from the center vertically,

its upper end having a catch 3' projecting horizontally toward the frame; on the hub of the ratchet wheel (*q'*), there is a pinion (*q''*) that works into a spur-wheel (*q'''*) placed on a stud in the frame directly below it; this wheel also has a pinion (*q''''*) on its hub, that works into a spur-wheel (*q'''''*) placed under it, and on the same plane. The wheel (*q'''''*) is on the axle of the cloth, or ribbon roller (*r*), the motion of which is sufficiently decreased by the train of wheels above described. At each vibration of the lathe forward, the ratchet wheel (*q'*) is turned a little, communicates motion to the ribbon roller, and winds on the ribbon as it is woven. It will readily be seen, that the apparatus above described, would move the roller (*r*) the same distance at each vibration of the lathe, but it is necessary so to regulate it, that, as its diameter increases, its motion should be slower; which is effected in the following manner.

Just below the wheel (*q'''''*), a little in front of its center, a stud (*s'*) projects from the frame, on which a collar about two inches long fits, and turns; at the end of this collar farthest from the frame, an arm 5 extends out at right angles to it, which inclines upward; this arm bears on its upper end a revolving roller (*s''*), which is parallel to the roller (*r*), and rests against it; nearer the frame, another arm 4 projects from the collar forward horizontally; in which a slot is made, extending from near the forward end, along about half its length; in this slot an adjusting pin is put, by which a vertical rod (*t*), is connected with it; this rod extends up nearly to the top of the frame, and is guided by passing through a loop (*t''*) attached to the frame; it is in the same plane as the arm 2, and has a sliding gage (*t'*) on it which projects under the arm 2; that can be fastened at any point on the rod (*t*), by a set screw. The arm 2 is drawn down by a spring 2', attached to the frame below, till it rests on the gage. As the roller (*r*) increases in size, the gage is elevated, and allows the arm 2, and pawl (*q*) less and less vibration; thus regulating the movement of the roller (*r*) as desired, by causing it to revolve a less distance, at each beat of the lathe. The roller (*s''*) is borne up against the ribbon roller by a spring which draws down the forward end of the lever 4.

The coupling bar (*m*) is in two parts, so that it can be made longer or shorter at pleasure, by means of set screws, thereby acting on the arms 1, 2, 3, more or less as desired.

Motion is communicated to the yarn-beam, or warp-roller (*s*) by the endless band (*r''*) which is carried around a grooved pulley thereon; from thence it descends down behind the frame, around two vertical pulleys

near the floor; from which it runs forward horizontally to the pulleys which are under the ribbon roller, around which it is guided, and passes up over the pulley (r').

5 The beam (s) is sustained by its journals, on the ends of two levers (s^2) which are suspended near their center, at the top of the back uprights of the frame; to their forward ends spiral springs (y^3) are affixed, to which
10 are connected horse hairs (y^4); these pass through eyes in the upper ends of the vertical rods (y') which stand parallel with, and directly behind, the harness (h, h'); these hairs are then drawn through the reed,
15 and are woven into the edge of the ribbon, to form the edge.

The variety with which the edge is made is effected by a jacquard of the following construction: An axle turns in the ends of
20 two arms (V^3), which are attached to the uprights at the back of the loom; from this axle an arm (V') rises vertically at each end, which bear the jacquard roller (V'') on their upper ends; another arm (V) projects forward horizontally from the axle
25 above named, to the shaft E, on which a cam (w) is put, that works it; the forward end of the arm (V) is the segment of a circle, curving upward; the cam (m) throws
30 the arm (V) up, and the roller (V'') backward; they are brought back by means of a spring (y''), one end of which is attached to arm (V), the other to the frame below. At one end of the jacquard cylinder are
35 projecting pins (V''') on which a hook (W), attached to the frame rests; this hook, when the cylinder is thrown back, takes hold of one of the pins (V''') and causes the cylinder to turn a proper distance; the cylinder
40 is held steady by a short lever having its fulcrum in one of the arms (V') directly under the pins; which lever is pressed up against them by means of a spring (y') at its opposite end; this prevents the cylinder
45 from turning too far, when the loom is in the most rapid operation. On a level with the center of the cylinder there is a row of needles (x') which enter holes in the side of the cylinder, as in the common jacquard;
50 (the figure being made by the holes in the cylinder) the needles are drawn back by springs (x''), and they are connected with the lower ends of the upright rods (y), by connecting wires (x'''); by this arrangement
55 when a blank on the cylinder (V'') is brought opposite one of the needles, the needle is pushed forward, which carries with it the lower end of the rod (y) to which it is connected, and brings it in contact with a bar (h^2), on the heddle frame
60 (h') with which it is raised; those needles that are opposite the holes in the cylinder remain stationary.

The horse hair above named, is held in

its place by the springs (y^3) and as the ribbon progresses forward, draws out from its edge, leaving the pearl or other formed edge as required. 65

A jacquard similar to that above described, may be used for figuring ribbons, 70 where the pattern is not too complex.

To stop the loom when the filling runs out, or breaks, or when the ribbon becomes contracted from any cause, the following apparatus is used—(see No. 7, where the 75 parts are colored deep blue). To the breast beam a roller (m^3), is attached, over which the ribbon passes; just in front of this roller a lever (m'') which extends toward the lathe; that end is divided into two prongs, 80 the ends of which are turned down at a right angle, and rest on the cloth near each edge; below the lever (m'') a shaft runs parallel with the breast beam, on which two arms (n) radiate upward, the inner arm, 85 when the loom is in operation, is in contact, with the end of lever (m''); a weight is attached to it which tends to turn it down; on the same shaft with arms (n), there is a cam (n') that holds down the forward end of a horizontal arm (n''), which end is turned up at right angles; this is at the side of the frame, and is pressed up by a spring; the other end of the arm is attached to the upper end of a vertical rod, 95 the lower end of which is fastened to the frame so as to allow the upper end to move; just forward of the vertical rod last named, a horizontal catch (o) is connected with arm (n'') near its forward end; this catch 100 is connected with a vertical rod, similar to that just described; this rod is pressed forward by a spring on the frame; a vertical catch-bar (m') is placed in front of the catch (o) with a projection (o') on its upper end, which rests on the catch; it also has a handle on it, that extends beyond the front of the frame: to the lower end of the bar (m') (see No. 1, and 2,) a lever (p') is attached, the fulcrum of which is a long 110 shaft (p) on the opposite side of the frame and parallel with it just above the lower girth D; on the back end of this shaft (p) (in front of the belt (c) by which the loom is driven) there is a vertical arm (p'') the 115 upper end of which is connected with a shipper (p''') in which the belt (c) runs.

When the filling is run out, or the ribbon narrows, the ends of the forked lever (m') fall down between the warp or outside the 120 edge, as the case may be, far enough to clear the arm (n), and allow it to turn, which relieves the arm (n'') from the cam (n') and the arm rises—this brings a projection on the side of (n'') (not shown in 125 drawing) in contact with the projection ($3'$) on the end of the upright lever 3, which lever, being vibrated backward, carries with

it the catch (*o*), and frees the bar (*m*) from it; the bar (*m'*) falls down, and turns the shaft (*p*) and shipper (*p''*) which casts the belt from the fast to the loose pulley on shaft B, and stops the loom.

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

1. The pickers constructed as above described, and also, their combination with the lathe in the manner and for the purpose herein set forth.

2. I claim regulating the take-up motion, by means of a roller which rests against the cloth beam acting on an upright rod (*t*) with a gage thereon to curtail gradually the motion of the pawl (*q*) and thus decrease the distance the cloth beam turns, as it en-

larges, constructed and combined substantially as herein made known.

3. I claim the combination of the jacquard constructed as above described with the upright rods (*y*) in the manner and for the purpose before specified.

4. I claim the apparatus for stopping the loom, that is to say, the forked lever (*m''*), arms (*n*), eccentric (*n'*), hook (*n''*), catch (*o*), and upright bar (*m'*), constructed and arranged as herein described in combination with the shipper (*p''*) for casting off the belt and stopping the loom.

CARL v. GANAHL.

Witnesses:

CARL TRASERER,
PETER HENGST PLÄGER.