

## NEW INVENTIONS.

## Power Loom for Weaving Hair Cloth.

The annexed engravings are views of a loom invented by John Gledhill, of this city, for weaving hair cloth by power, an invention which is as valuable for the weaving of hair cloth as the power loom for the weaving of cotton cloth. Figure 1 is a front elevation; figure 2 is a longitudinal vertical section; figure 3 is a cross sectional view of a double trough containing the hair for the weft; figure 4 is a side view of certain parts of the same to illustrate a part named the "automatic server," and figure 5 is a front view of the nippers which draw the hairs that form the weft, through the shed of the warp. The same letters refer to like parts on all the figures.

Hair cloth is composed of a warp of linen threads, the weft being hair. As each hair is like a single thread, and has ends of unequal thickness, it (the cloth) has never been woven heretofore but by hand—the fine end of one hair is drawn through to match at the selvage with the thick end of the preceding hair. It will easily be seen that such a mode of weaving hair cloth is exceedingly expensive and tedious. As the hairs are all like single threads—one hair for each shot—a formidable difficulty stood in the way of weaving such cloth by continual action as in the power cotton loom, where the thread is continuous on a cope, and is shot off in continuous lines. Mr. Gledhill has in a very ingenious manner surmounted every difficulty, and produced a loom for this purpose which does honor to his inventive faculties, and credit to his perseverance. There are also some improvements on this loom, which are applicable to all other looms for weaving cloth.

A is the frame; B is the crank shaft having the main driving pulley on it; C is the harness shaft—the one on which the cams are secured for working the treddles; D is the lay; these parts and the yarn and cloth rollers are the same as those in the common power loom. The arrangement for transmitting motion from the crank shaft, B, to the lay, D, is best shown in figure 2, and embraces an improvement applicable to all looms, viz., a mode of keeping the shed open for the passing of the shuttle or feeder with the weft thread, as long a period as possible during every revolution of the crank shaft, B. The main connecting rod is represented by E, which is the longest part, and is attached to the lay by a pivot, a; F is a link which connects the crank with E, by a pivot, b, which serves also to connect the radius rod, G, which works on the fixed centre pin, b'. The movement given to the lay by this arrangement is the full throw of the crank, the effect of the link and radius rod being to increase the speed during the forward portion of the stroke, and to decrease it during the backward portion of it, and thus keeps it longer in a backward position for the purpose stated.

The loom represented requires only two leaves of harness, but that is sufficient to show an improvement in the harness motion, which is adapted for all cloth looms. Each leaf is suspended at the extremity of two cords, d d', of which d is attached to the right hand end of both leaves, and d' to the opposite end; the said cords passing over pulleys, H H H', which work at the back of the top rail, I, of the frame, and around the pulley, J, whose axle is in the upper end of the rod, K, which works vertically in guides, e e, outside the frame. The rod, K, has a spiral spring, applied to it, to draw it downwards. The bottoms of the leaves of the harness are attached to treddles, L L, which are moved by cams, M M, on shaft, C, in a well known way. One harness is always caused to rise by cords, d, and d', when the other is depressed by the treddles, and thus both are balanced while a proper tension is preserved on each by the action of the spring, in drawing down the pulleys perfectly steady, and thus a most excellent system of harness balancing is carried out. These two combinations and arrangements of machinery belonging to this loom are adapted to other looms; we will now describe the entire new arrangement

parts, and combinations for weaving hair cloth by this loom.

The line passing over the rollers behind the lay represents the warp; the quadrangle representing the shed or opening of the yarn of the warp by the heddles or harness to allow the hairs to be drawn through; M is a hopper for containing the hairs each by itself standing in water; this hopper has two compartments, one for containing hairs with their thickest ends uppermost; the other containing hair with the smallest ends uppermost.

One hair is taken from each bunch alternately, so as to lay a thick and fine end alternately together for the weft. This hopper is attached to the left hand of the loom, and there are two troughs, g g, arranged parallel with each other side by side, as shown in figure 3. A narrow slit is made transversely across the bottoms of both, and the ends of the hairs extend from the hopper, M', into these troughs protruding through, to be caught, as we shall explain, by the automatic feeder. A cord, i, is attached to the frame at the side of the

troughs, and passes through the slit, i, above the bunches of hair, and has a weight, N, suspended to it, which keeps the hair tight in the trough.

Attached to the loom breast beam is the arm, O, which carries the automatic server; this arm is adjustable back, forth, and sideways; P is a square head pivoted at the side of the arm, and has on its face four studs, k, one of which is caught and acted upon by a hook, l (attached to the lay) every time the lay recedes, in such a manner as to perform

Figure 1.

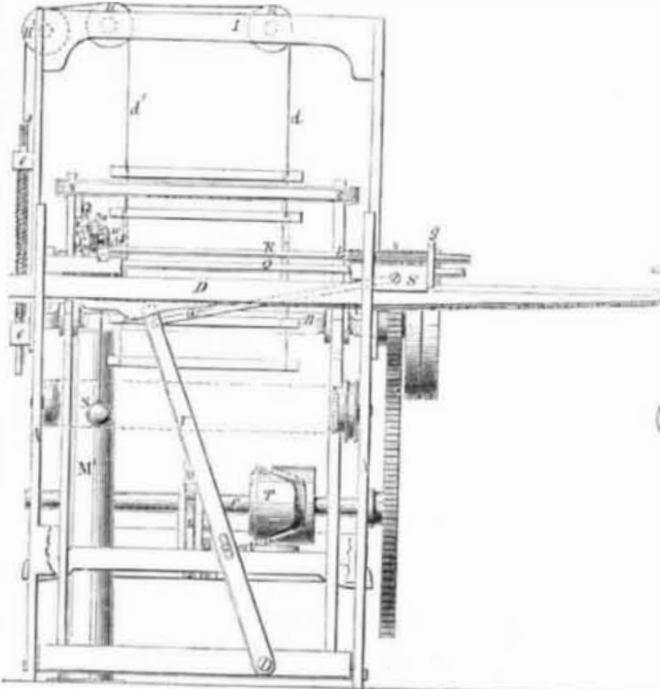
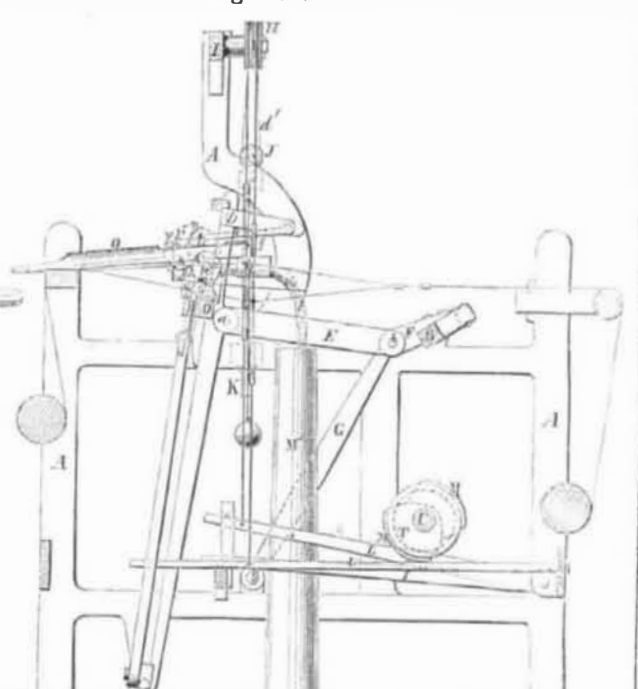


Figure 2.



one quarter of a revolution, it being prevented from turning further by a spring bearing piece, m, which is forced against the back side by a spiral spring, m', the spring yielding to the operation of hook, l, but preventing the head being turned accidentally. On each of the four sides of head, P, there is a serving hook, n, made of a curved piece of steel secured by one end to the head, and having a V-shaped notch cut on its outer end. These hooks require to be alternately at opposite ends of the troughs, g g, of the hopper. Every time the lay recedes after a beat up, the hook, l, turns the head, P, and one of the serving hooks, n, takes a single hair in its notch, and draws it forward from the hopper, M', to such a position that a pair

of nippers will seize it, and draw it through the weft thread. For some kinds of work, it may be necessary to take two or more hairs at a time, and for this purpose, the serving hooks can be made with two or more notches, but to take one hair at once, the notch of the hook must be made of a size to take in no more. These hooks never fail, as they repeatedly as the end of each hair is prepared to effectually accomplish this object.

The nippers by which the hairs are pulled through the warp consist of two long rods, Q R, figure 5, terminating in jaws, o p; these bars must be long enough to extend clear through the warp, and leave the jaws protruding on one side, and a considerable portion of their length on the other. The right hand

when the return stroke is about to commence, the upper jaw, p, descends and takes a hair from the serving hook, embracing it firmly and carrying it through the warp. The lay is then beat up, and a shot of weft completed. The nippers have a forward and back motion for one shot of weft.

A spring drag is secured to the loom to tension of the nippers. In this loom, one inch of hair lost in the hand loom every shot, is saved, which amounts to a great deal in the length of a web. The operations we have described by this loom, will show that the useful results obtained are designed to affect an entire revolution in the manufacture of hair cloth.

Measures have been taken to secure a patent, and as the invention is quite a novel one, the claims are extensive.

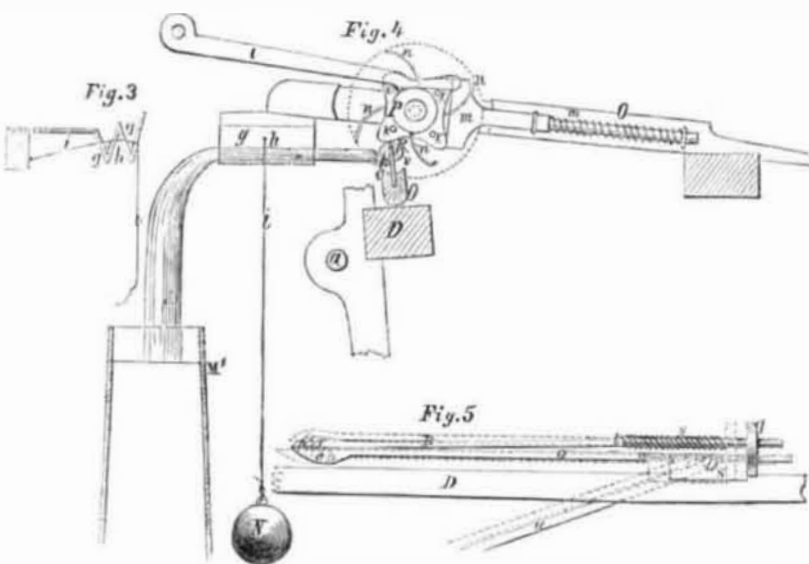
## A new Journal Box.

A new journal box, intended more particularly for railroads, has been constructed by G. V. Alden and John Smith, of Hornelsville, N. Y., the objects which are accomplished by the invention, are a more perfect method of lubricating the axle without the possibility of the lubricating material being unnecessarily wasted, and also allowing the necessary play of the axle in the box, without permitting dust to enter the bearing. The centre of the box is provided with a circular reservoir for oil in the usual manner. Two circular chambers are also cut, one in each end of the box which chambers receive thick collars nicely fitted to and forming the bearing for the axle; these collars fill the circular chambers, and rest upon a spring at their periphery, so that the axle may have a slight play at each end of the box, and still be closely fitted to the collars. This prevents the escape of oil and prohibits the approach of dust or dirt. Measures have been taken to secure a patent.

## Models for Inventions.

Inventors will perceive by reference to an advertisement in this number, that they may obtain models for any kind of machinery by addressing Mr. Fairbanks, at this office. This will accommodate those inventors who have frequently inquired of us where they could get a model constructed to represent their inventions.

Sufficient stock has been subscribed in Baltimore to build a steamship to run between that city and Liverpool.



end of the lower rod, Q, is rigidly attached to (though it may be adjustable on) a block, S, which is capable of sliding on the sole of the lay. The right hand end of the upper rod works freely through a guide, u, attached to the block, S, and is connected near the point of the jaw by a radius link, v. It has a spring, s, coiled round it within the guide, q, which always tends to close it, and on its back side there is a work stud, t, projecting from it.—The nippers are caused to pass quickly through the open shed while the lay is finishing its backward motion, and grip the hair, v which is held in readiness by the server, and then return with it through the open warp, by a transverse motion given to block, S, by

revolving cam, T, on the harness shaft acting upon the horizontal vibrating lever, U, which operates the picker staff, V, to which is connected an arm, w, attached to the nippers, and which works them exactly like the power loom picker staff. While the nippers are passing through the shed to fetch the filling—hair, they are kept closed by a spring, s, until the points of the jaws have passed through the shed, and have arrived opposite the server, when the stud, t, comes in contact with the right hand sword on the lay, or a suitable stop, which holds the upper part of the nippers back, raising it by the radius link, v, fig. 5. The jaws of the nippers being thus opened, a hair is received between them, and