# Scientific American.

### 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 west, 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 west being hair. As each hair is like a single thread, and has ends of unequal thickness, it (the cloth) has never been woven heretotore but by hand-tne fine end of one hair is drawn through to match at the selvedge 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 shatt 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 west 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 leat 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 trame. 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 arrangements of machinery belonging to this

loth by this loom.

The line passing over the rollers behind the

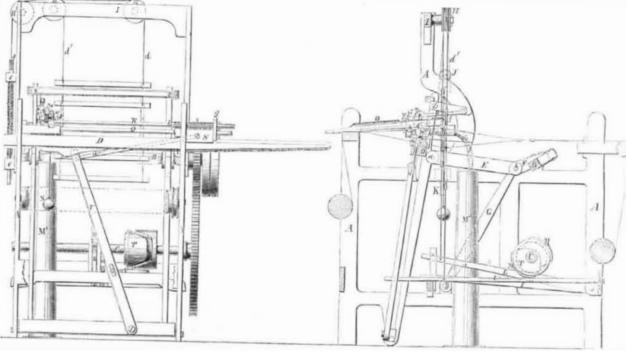
parts, and combinations for weaving hair One hair is taken from each bunch alternate- troughs, and passes through the slit,  $h_i$  above ly together for the west. This hopper is at- pended to it, which keeps the hair tight in ay represents the warp; the quadrangle re- tached to the left nand of the loom, and there the trough. presenting the shed or opening of the yarn of are two troughs, g g, arranged parallel with Attached to the loom breast beam is the the warp by the heddles or harness to allow each other side by side, as shown in figure 3. arm, O, which carries the automatic server; the hairs to be drawn through; ha is a hop- A narrow slit is made transversely across the this arm is adjustable back, forth, and sideper for containing the hairs each by itself bottoms of both, and the ends of the hairs exstanding in water; this hopper has two com- tend from the hopper, M', into these troughs of the arm, and has on its face four studs, k, partments, one for containing hairs with their protruding through, to be caught, as we shall one of which is caught and acted upon by a thickest ends uppermost; the other contain- explain, by the automatic feeder. A cord, hook, l (attached to the lay) every time the ing hair with the smallest ends uppermost. i, is attached to the frame at the side of the lay recedes, in such a manner as to perform

ly, so as to lay a thick and fine end alternate- the bunches of hair, and has a weight, N, sus-

ways; P is a square head pivoted at the side

Figure 2.





one quarter of a revolution, it being prevent- of nippers will seize it, and draw it through when the return stroke is about to commence, ed from turning further by a spring bearing the west thread. For some kinds of work, it the upper jaw, p, descends and takes a hair hooks require to be alternately at opposite effectually accomplish this object. ends of the hairs, their notches being opposite the centres of the troughs, g g, of the hopper. Every time the lay recedes after a beat up, the hook, b, turns the head, P, and bars must be long enough to extend clear results obtained are designed to affect an entire one of the serving hooks, n, takes a single through the warp, and leave the jaws protru- revolution in the manufacture of hair cloth. hair in its notch, and draws it forward from ding on one side, and a considerable portion the hopper, M', to such a position that a pair of their length on the other. The right hand tent, and as the invention is quite a novel

piece, m, which is forced against the back may be necessary to take two or more hairs at from the serving hook, embracing it firmly side by a spiral spring, m', the spring yielding a time, and for this purpose, the serving and carrying it through the warp. The lay to the operation of hook, i, but preventing the hooks can be made with two or more notch- is then beat up, and a shot of west completed. head being turned accidentally. On each of es, but to take one hair at once, the notch of The nippers have a forward and back motion the four sides of head, P, there is a serving the hook must be made of a size to take in no for one shot of west. hook, n, made of a curved piece of steel se- more. These hooks never fail, as they re- A spring drag is secured to the loom to V-shaped notch cut on its outer end. These pecially as the end of each hair is prepared to tion of the hippers. In this loom, one inch of

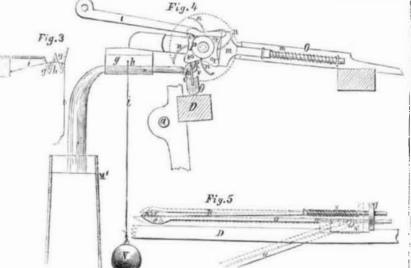
> through the warp consist of two long rods, length of a web. The operations we have de-Q R, figure 5, terminating in jaws, op; these scribed by this loom, will show that the useful

hair lost in the hand loom every shot, is The nippers by which the hairs are pulled saved, which amounts to a great deal in the

> Measures have been taken to secure a paone, 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 : 1. Acro a plished 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 the box, and still be closely fitted to the collars. This prevents the escape of oil and proend of the lower rod, Q, is rigidly attached to revolving cam, T, on the harness shaft acting hibits the approach of dust or dirt. Measures



which is capable of sliding on the sole of the operates the picker staff, V, to which is conworks freely through a guide, of, attached to the block, S, and is connected near the point of the jaw by a radius link, r. 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 most excellent system of harness balancing is through the open shed while the lay is finish-

(though it may be adjustable on) a block, S, upon the horizontal vibrating lever, U, which have been taken to secure a patent. lay. The right hand end of the upper rod nected an arm, u, attached to the nippers, and which works them exactly like the power loom picker staff. While the nippers are advertisement in this number, that they may passing through the shed to fetch the filling- obtain models for any kind of machinery by bair, they are kept closed by a spring, s, until addressing Mr. Fairbanks, at this office. This the points of the jaws have passed through will accommodate those inventors who have the shed, and have arrived opposite the serv- frequently inquired of us where they could er, when the stud, t, comes in contact with get a model constructed to represent their inthe right hand sword on the lay, or a suitable ventions. carried out. These two combinations and ing its backward motion, and grip the hair, v stop, which holds the upper part of the nipwhich is held in readiness by the server, and pers back, raising it by the radius link, r, fig.

# Models for Inventions.

Inventors will perceive by reference to an

Sufficient stock has been subscribed in Balloom are adapted to other looms; we will then return with it through the open warp, now describe the entire new arrangements by a transverse motion given to block, S, by ed, a hair is received between them, and that city and Liverpool.