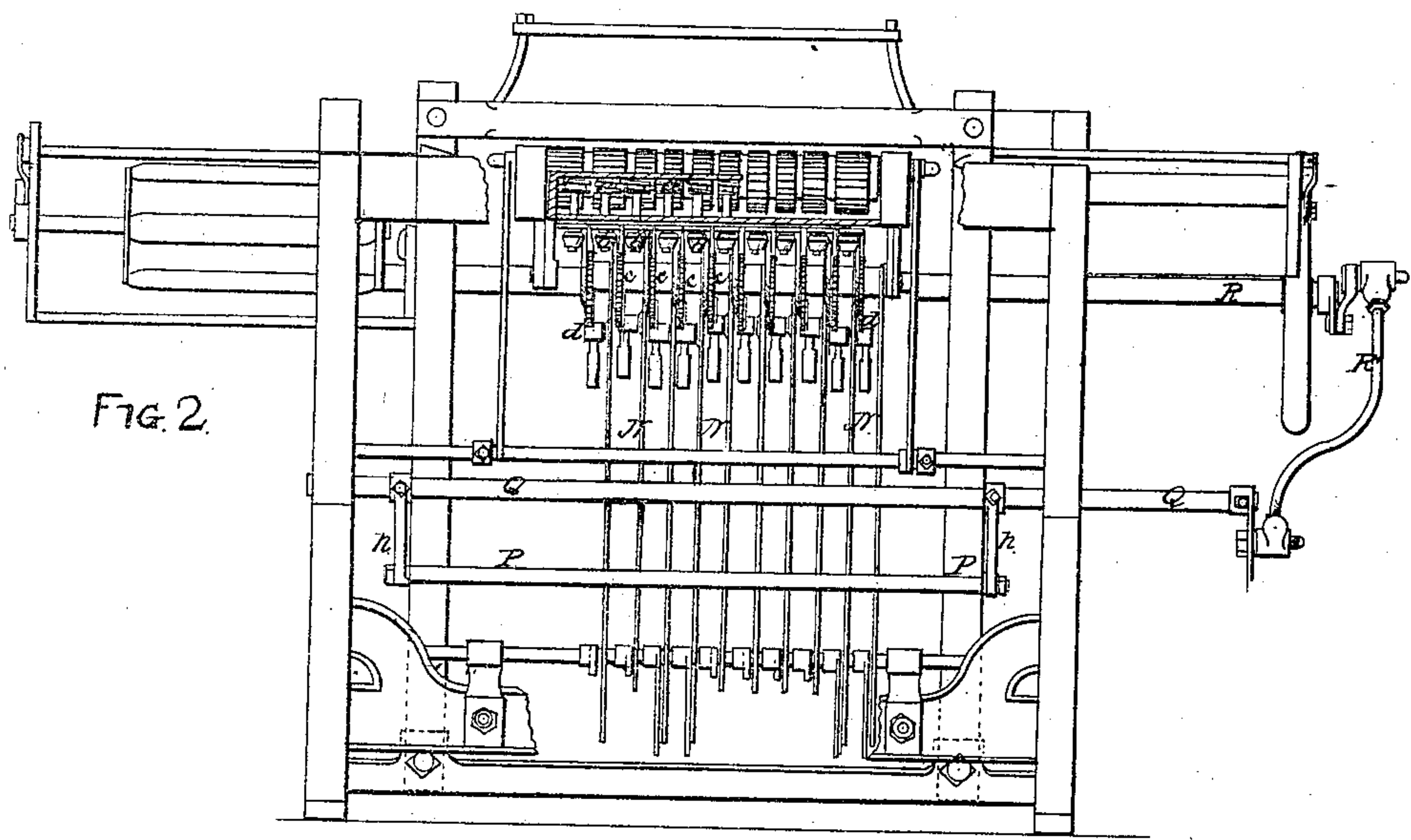
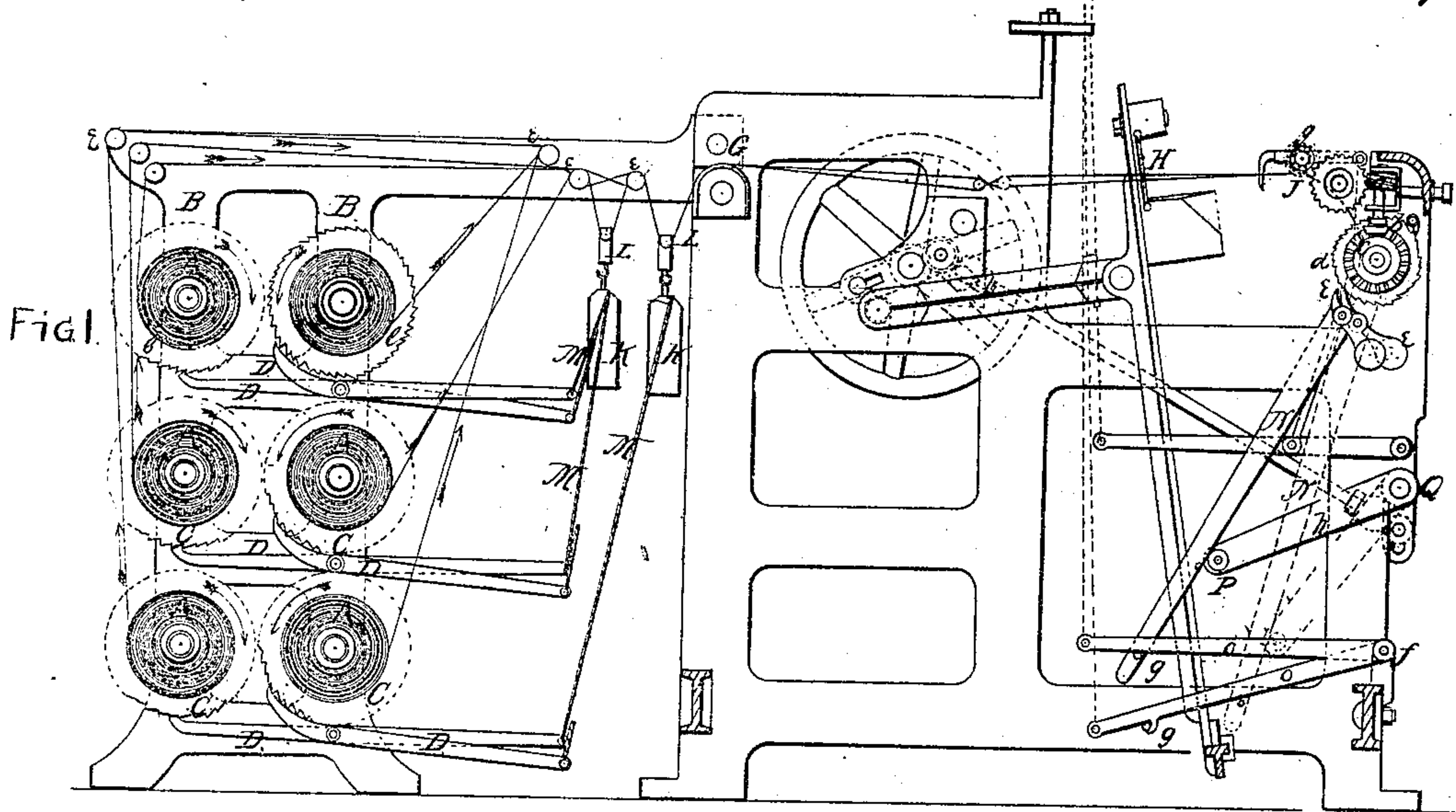


*C. Heptonstall*  
*Corset Loom.*

N<sup>o</sup> 92,722.

*Patented Jul. 20, 1869.*



Witnesses:

A. H. Harris

Chas W. Crane

*Inventor*

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# United States Patent Office.

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*Letters Patent No. 92,722, dated July 20, 1869.*

## IMPROVEMENT IN LOOM FOR WEAVING IRREGULAR FABRICS.

The Schedule referred to in these Letters Patent and making part of the same.

### *To all whom it may concern:*

Be it known that I, CHARLES HEPTONSTALL, now of the city and county of Providence, in the State of Rhode Island, formerly of Kirkburton, near Huddersfield, in the county of York, England, have invented certain new and useful Improvements in Looms for Weaving; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a side elevation, and

Figure 2 is a front elevation of so much of a loom for weaving fabrics of irregular shape as is necessary to make the invention intelligible,

This invention relates particularly to looms for weaving corsets or stays, and other uneven fabrics, for improvements in which English Letters Patent were granted to me, dated respectively the 22d day of June, A. D. 1864, No. 1,556, and 6th of July A. D. 1866, No. 1,790, but is in part applicable to ordinary looms for weaving even fabrics.

It is to be understood that in looms of this class several warp-beams are employed, among which the warp is divided, the number of such beams being determined by the shape to be given to the particular article to be woven in each case, and that the necessity for such plurality of warp-beams arises from the fact that the aggregated warp-threads are divided into sections, which sections must be independent of each other, so that any one or more of them can be given off by their beams, receive the filling from the shuttle, and the woven fabric be "taken up," while the other sections of warp remain stationary.

It is also to be understood that a jacquard-attachment is necessary to be combined with the mechanism, which lets off the warp from the beams, and takes up the woven cloth, to govern the formation of all irregular-shaped fabrics.

In the drawings—

A, fig. 1, indicates a series of small yarn-beams, each containing a supply of warp, and arranged in the suitable order required for the particular article to be made, and supported upon a proper frame-work, B, and each beam is provided with a ratchet-wheel, C, into which a catch-lever, D, takes by gravitation, when at liberty to do so.

The warp-threads are conducted from the said yarn-beams, over rails E, to and over the back beam of the loom G, thence, passing through the healds or heddles, to the reed H; the cloth when woven being taken up by fluted rollers, working in pairs, a pair being appropriated to each section of warp-thread, in the usual manner, and which has been fully explained in the specification of the English patents referred to.

K indicates a series of weights, each one suspended by a loop or pulley, L, on one of the sections of warp-threads, that is, one weight to the warp or each yarn-beam. To each weight is attached a cord or chain, M, which is connected to the catch-lever D of the yarn-beams, from which that section of the warp comes, so that when the weight is raised, by the taking up of the warp in weaving, the catch will be removed from the ratchet-wheel, and a quantity of warp will be given off; and on the weight falling, by the letting off of more yarn, it will allow the catch-lever to again take into the ratchet, and block the beam.

Springs may be used instead of weights for this purpose, but I prefer weights, as effecting greater uniformity of tension than springs.

The catch-levers D unlock the yarn-beams where the effect of the take-up motion is to raise the weights K, by pulling along the warp. The "take-up" motion is in turn, controlled by the jacquard, and the manner in which the two are combined is the further subject of my invention.

The fluted rollers I and J, arranged in a series corresponding with the sections of warp, take up the cloth, as already stated.

Appropriate to each pair of fluted rollers is a worm, a, set upright in supports in front of the breast-beam, with which worm the teeth of the lower roller J engage.

At the foot of the worm-shaft is keyed a bevel-wheel, b, which engages with a second bevel-gear wheel, c, figs. 1 and 2, arranged upon a shaft below and parallel with the breast-beam.

Upon the back of each wheel c is a ratchet-wheel, d, and with the teeth of this ratchet a pawl, e, engages.

These pawls are counterweighted, and are mounted upon fulcrum-pins, which project from the sides of levers N, hinged to the same transverse shaft upon which the bevel-wheels c are arranged.

Obviously, if a vibratory movement be given to the levers N, the pawls e, attached to the same, will work with the ratchet d, and the consequent rotation of the bevelled wheel c will cause the fluted "taking-up" roller to be put into action.

So many only of the fluted "take-up" rollers are to act at any given time as the jacquard allows. Provision must therefore be made to so combine the jacquard with the levers N, controlling the operative pawls e, as to remove them beyond the influence of the mechanism, which would otherwise keep them in vibration.

To this end, it will be seen that there is a series of bars, o, (one to each lever N,) hinged at one end to a transverse rod, f, and at the other end, connected by strings with the jacquard.

Each of these bars has upon its under side a projecting catch, g, which catch, unless the front end of the



bar *o*, to which it belongs, is raised, will engage with a pin upon the side of its fellow-lever *N*, and hold it beyond the influence of a vibrating rail, against which it would otherwise rest, and be worked by it.

The vibrating rail, which gives motion to the levers *N*, when the latter are not blocked up by the catches on the bars *o*, and which consequently works the "take-up" rollers, is seen at *P*, fig. 2.

It is attached, by arms *h h*, to the rocking shaft *Q*, which receives motion from an adjustable crank, fixed on the end of the revolving shaft *R*, by means of the connecting-rod *R'*.

It is obvious, that as the rail *P* is constantly vibrating, it will work such only of the levers *N* as the jacquard permits to bear against its face, and consequently operate the "take-up" rollers with which they are respectively connected.

The throw of the crank upon the shaft *R* can be regulated at pleasure, and this, in connection with the employment of worm-gears as a means of communicating movement to the "take-up" rollers, enables the extent to which such "take-up" rollers can be moved, to be adjusted with the greatest nicety.

I wish it to be understood, that in looms of my construction, under the English patents hereinbefore mentioned, I have applied weights to the warp, as a means of obtaining uniform tension, but that the use of such

weights in combination with catch-levers, taking into ratchets on the warp-beams, is a further improvement upon such looms.

I have also, in the instances referred to, made use of a vibrating rail in combination with levers carrying pawls, and working, by direct action, the "take-up" rollers, but which pawls were not combined with such "take-up" rollers by means of intermediate worm-gears, so as to enable the movement of the "take-up" rollers to be accurately adjusted, by adjusting the throw of the crank which operates the vibrating rail.

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

1. The combination, with "take-up" rollers *I* and *J*, and vibrating pawl-levers *N*, of the intermediate worm-gears *a*, arranged and operating substantially as described.

2. Also the combination, substantially as specified, of the warp-weighted "let-off" apparatus with the "take-up" apparatus, constructed and operating as described, whereby the two mechanisms are made to work in more complete harmony with each other in the organized loom.

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Witnesses:

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