

(No Model.)

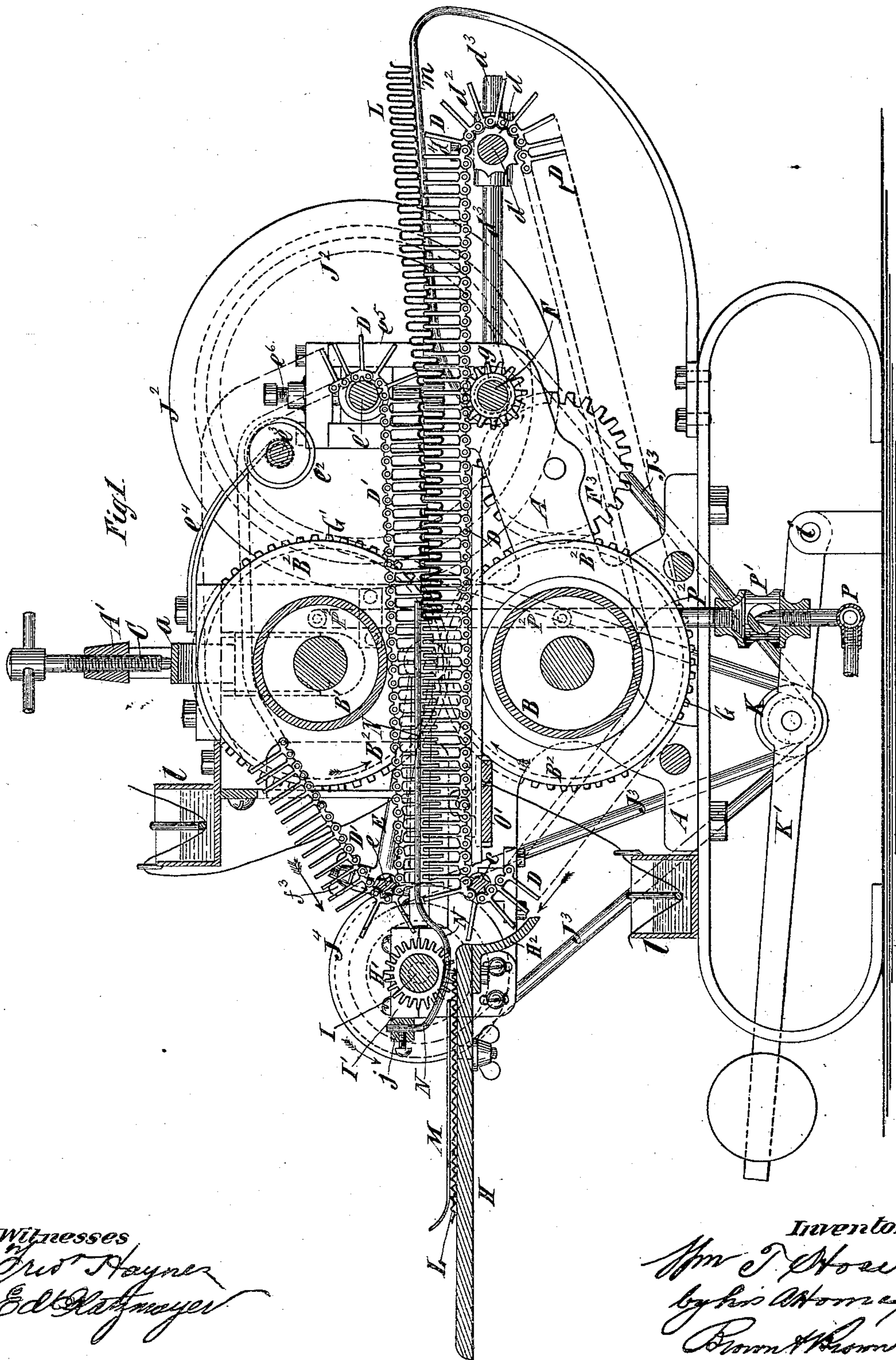
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W. T. HOSE.

MACHINE FOR MAKING RUCHINGS.

No. 246,011.

Patented Aug. 23, 1881.



Witnesses
Geo. Hayner
Ed. Stutzmayer

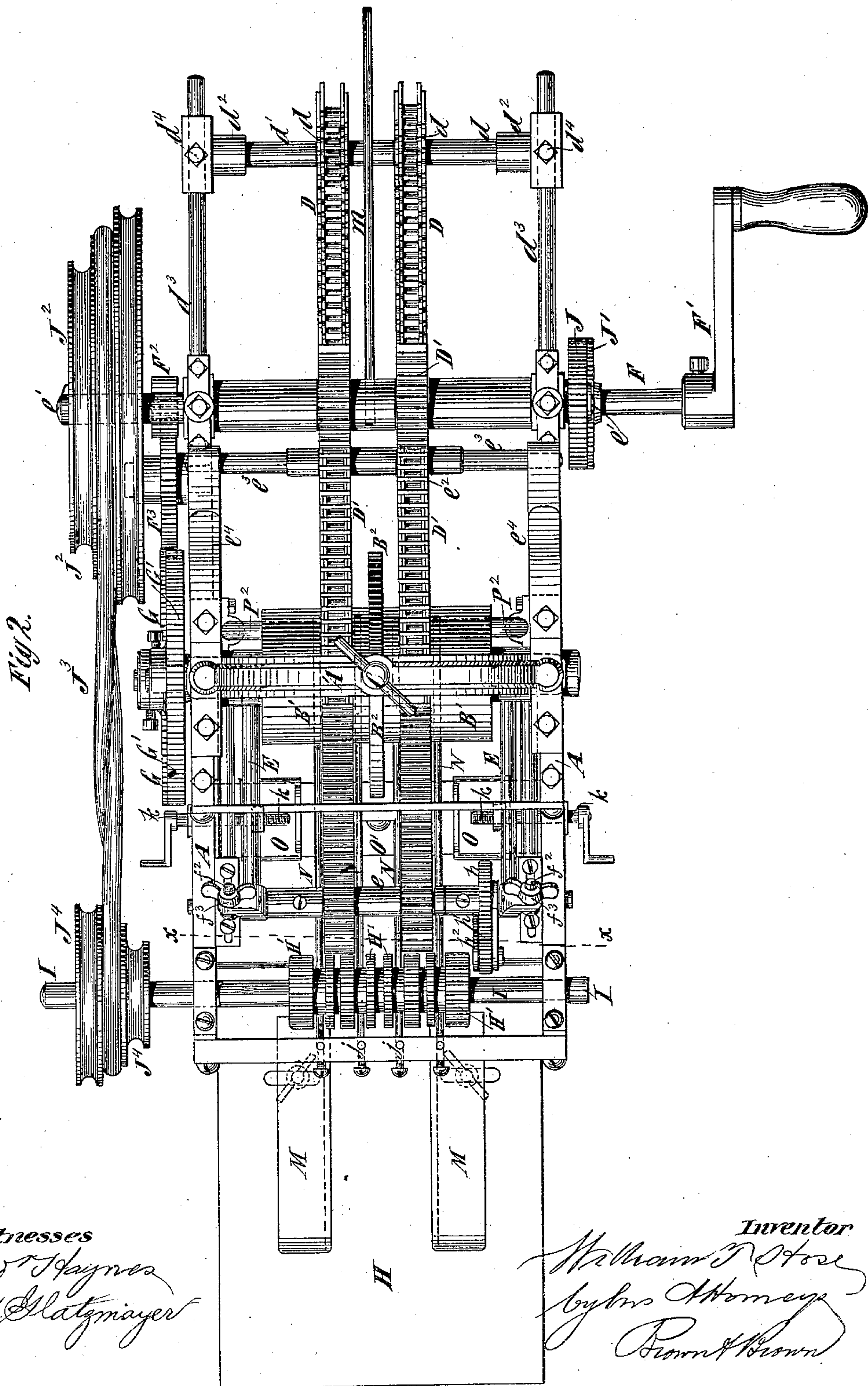
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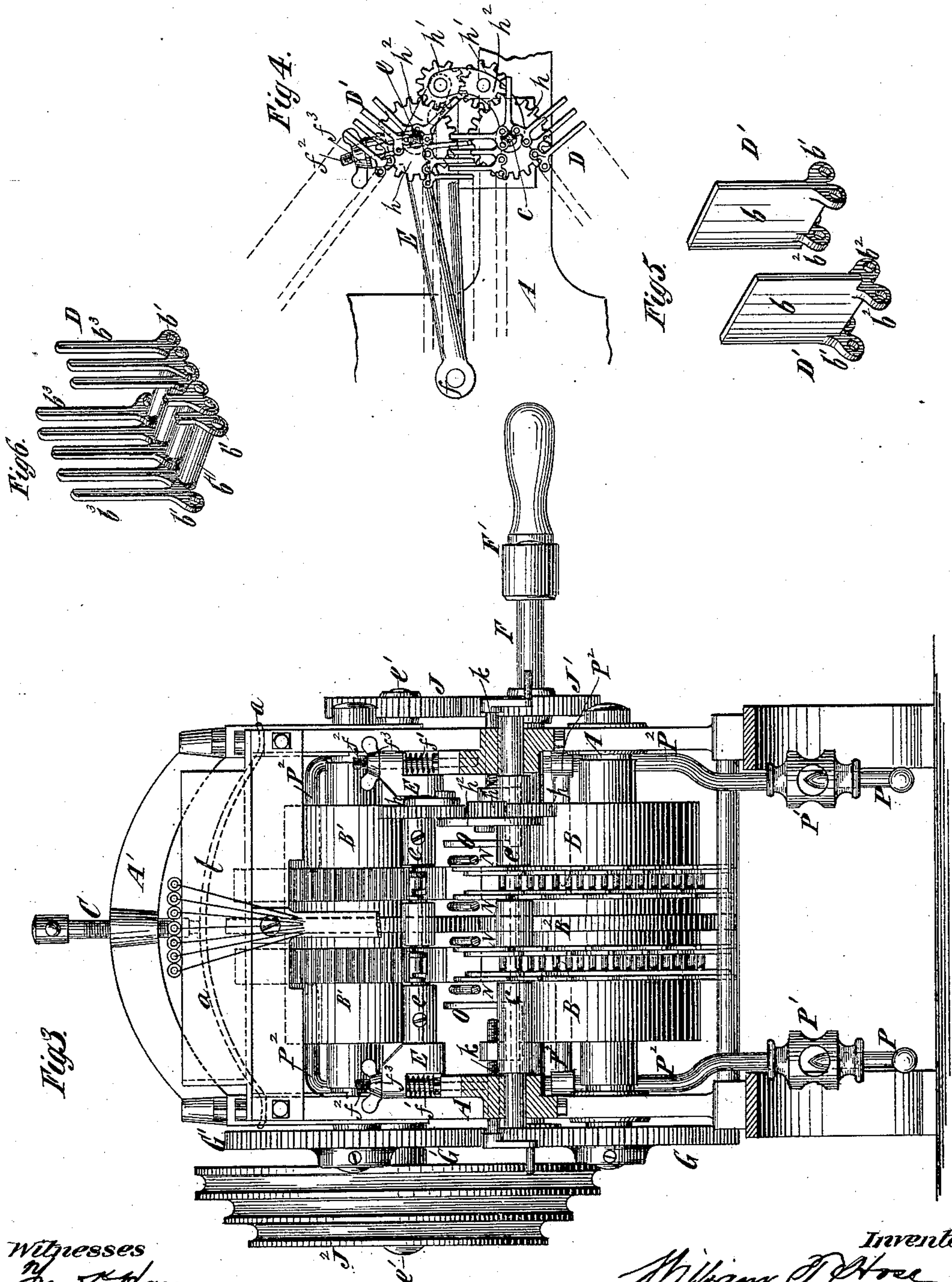
3 Sheets—Sheet 3.

W. T. HOSE.

MACHINE FOR MAKING RUCHINGS.

No. 246,011.

Patented Aug. 23, 1881.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING RUCHINGS.

SPECIFICATION forming part of Letters Patent No. 246,011, dated August 23, 1881.

Application filed June 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. HOSE, of the city and county of New York, in the State of New York, have invented certain new and
5 useful Improvements in Machines for Making Ruchings, of which the following is a specification.

My invention relates to machines for making ruchings, in which the fluting of the strip
10 of fabric from which the ruchings are produced is performed by intermeshing endless chains.

The invention consists in the combination, in such a machine, of two pressing-rollers, arranged one above the other, and between which
15 a strip of fabric is passed, and which flatten and press the middle portion down, and two pairs of intermeshing chains arranged on opposite sides of said rollers for fluting the marginal portions of the fabric while said rollers
20 flatten and press down the middle portion.

One serious difficulty heretofore existing in chain-fluting machines has been that the flutes become disarranged and distorted by the withdrawal of the chain-blades from each other as
25 they pass around the end chain wheels or rollers of the machine.

One object of my invention is to obviate this difficulty; and to this end the invention consists in a machine for making neck-ruchings
30 comprising one or more pairs of endless intermeshing chains, which diverge gradually toward the exit end of the machine for the whole or a part of their entire length, thus withdrawing the blades of the two chains from the flutes
35 of the ruching before the chains pass over their wheels in returning to the entrance end of the machine.

The invention also consists in novel means of varying the depth to which the blades of
40 the two chains intermesh at the entrance end of the machine.

The invention also consists in a novel method of arranging the endless chains used in the
45 aforesaid machine, and in details of construction to be hereinafter explained.

In the accompanying drawings, Figure 1 represents a longitudinal vertical section of a machine embodying my invention. Fig. 2 represents a plan thereof. Fig. 3 represents a trans-
50 verse vertical section upon the line *x x*, Fig. 2.

Fig. 4 represents a portion of the two chains at the entrance end of the machine, together with gearing for transmitting motion from one to another. Fig. 5 represents a perspective view of two of the blades or links of which the
55 upper chains are composed; and Fig. 6 represents a perspective view of a portion of the lower chains of the machine.

Similar letters of reference designate corresponding parts in all the figures. 60

A designates the two side frames of the machine, which are connected by suitable stretchers, so as to form a rigid framing; and B B' designate lower and upper hollow drums, arranged one over the other, and adapted to rotate in suitable bearings in the two side frames,
65 A. The shaft of the lower drum, B, is mounted in fixed bearings; but the shaft of the upper drum, B', is mounted in movable bearings, upon which the ends of a spring, *a*, bear, and
70 which are impelled downward by said springs.

The tension of the spring *a* may be regulated by an adjusting-screw, C, which is fitted in a nut formed in a yoke or cross-bar, A', as best
75 seen in Fig. 3.

At about the middle of the length of the drums B B' are portions B², of considerably larger diameter, which may be made in the same pieces with the drums or be separate disks fitted and secured upon the drums. The
80 portions B² rotate in face-to-face contact, and constitute rollers for flattening and pressing material passed between them.

Upon each side of the rollers B² is a pair of intermeshing endless chains, by which the fluting is accomplished, and which I will now describe. 85

D designates the lower chain of each pair and D' designates the upper chains, which intermesh therewith. 90

In the present example of my invention the upper chains, D', are of different construction from the lower chains, D; but this is done to show two methods of constructing the two chains, either of which may be employed, and
95 both the upper and lower chains will, in practice, be of one and the same construction.

The form and manner of constructing the two chains are shown most clearly in Figs. 5 and 6, the former of which represents a por- 100

tion of the upper chains, D' , and the latter a portion of the lower chains, D .

Referring first to the upper chains and Fig. 5, b designates the blades of the chain, which are provided on opposite sides at their lower edges with projecting lugs or ears b' b^2 . The lugs or ears b' are at the extreme edge of the blade b , while the lugs or ears b^2 are at a distance from the edge about equal to their thickness. Each blade b has on one edge lugs or ears b' and on the opposite edge lugs or ears b^2 , and when the blades are alternated the lugs or ears b' of one blade will fit upon the outside of the lugs or ears b^2 of the adjacent blades, thus forming an interlocking series of links, which are secured together by pins or pintles passing through perforations or holes in the lugs or ears $b' b^2$.

Referring, now, to the lower chains and Fig. 6, b^3 designates prongs or arms or bars, each having at its end lugs or ears b' , which project on opposite sides thereof and have in them holes or perforations. The pins or pintles b^4 employed in this case must have shoulders at the ends, which may be formed by reducing the diameter of the end portions or by slipping upon the pins small sections of tubing in a well-known manner.

In constructing the chain D , (shown in Fig. 6,) each link of the chain is formed by two bars, arms, or prongs, b^3 , and the lugs or ears b' on alternate links overlap the lugs or ears on the intermediate links and receive through them the ends of the pins or pintles b^4 . The lower chains, D , of the two pairs are passed around and supported by the lower drum, B , a rotary bar or shaft, c , at the entrance end of the machine, and chain or sprocket wheels d , fixed upon a shaft, d' , at the exit end of the machine, all shown clearly in Fig. 1.

The requisite tension upon the chains is produced by moving the shaft d' , upon which are the wheels d , bodily away from the drum B , and in order to provide for this I have represented the shaft d' as journaled in bearings d^2 , which may be adjusted along horizontal rods d^3 , projecting from the frame of the machine, and which, when adjusted to proper position, may be secured to said rods by means of set-screws d^4 , as shown most clearly in Fig. 2. The tightening of the chains D causes them to bear upon the under side of the lower drum, B , upon each side of its roller B^2 , as seen clearly in Fig. 1. The endless upper chains, D' , of the two pairs are arranged so that their blades b intermesh with the blades of the lower chains, and said upper chains are passed around and supported by the upper drum, B' , a rotary shaft or bar, e , near the entrance end of the machine, a second rotary shaft or bar, e' , near the exit end of the machine, and wheels or rollers e^2 , fixed upon a shaft, e^3 , which is mounted and free to rotate in journals formed by or attached to the free ends of springs e^4 , which impart to said shaft e^3 a constant outward and upward tendency.

The shaft e' is journaled in bearings e^5 , which, by means of set-screws e^6 , may be pressed downward to cause the blades b of the chain D' to intermesh more or less with the blades of the lower chains, D . The proper amount of tension is imparted to the upper chains, D' , by means of the shaft e^3 , carrying the wheels e^2 , which press the chains upward and outward, and thereby cause them to be drawn over and pressed against the top of the upper drum, B' , as best seen in Fig. 1.

The bar or shaft e at the entrance end of the machine should be adjustable toward and from the lower chains, D , to cause the blades of the chains D' to intermesh more or less with the chains D at the entrance end of the machine, so as to form flutes of the required depth, and to provide for such adjustment the said shaft or bar is journaled in bearings formed in the free ends of bars or links E , which are pivoted at f to the side frames of the machine, and are capable of swinging up and down, carrying with them the bar or shaft e . The swinging bars or links E are automatically moved upward, when released, by means of springs f' , (best shown in Fig. 3,) and are drawn against the force of said springs by means of adjusting-screws f^2 , provided with nuts f^3 , and passing loosely through the ends of said links or bars, and fixed in the frame of the machine, as seen in Fig. 3.

From the above it will be readily seen that by adjusting the nuts f^3 the two chains of each pair may be made to intermesh more or less, as may be desired, to suit the depth of flutes to be produced.

One very important feature of my invention will be best understood by reference to Fig. 1, in which it will be seen that the relative distances of the bar or shaft e at the entrance end of the machine and the bar or shaft e' at the exit end of the machine from the lower chains, D , is such that the two chains of each pair gradually diverge from each other, and hence the blades of the two chains, in passing from the entrance to the exit end of the machine, intermesh less and less until, at the bar or shaft e' , the blades of the upper chains, D' , do not intermesh at all with those of the lower chains. This gradual withdrawal of the chains D' from the chains D is very important, because the blades of the chains D' are gradually withdrawn from the flutes of the fabric, instead of being suddenly withdrawn when passing around the shaft or bar e' , as would be the case if the two adjacent moving portions of the chains of each pair were parallel.

The distortion or disarrangement of the flutes where the blades of the fluting-chains are suddenly withdrawn from the fabric, as in machines in which the two intermeshing chains are parallel, has heretofore been a great disadvantage in chain-fluting machines, and this objection to their use is overcome by my invention.

Turning, now, to the mechanism for impart-

ing motion to the several parts of my machine, F designates a driving-shaft mounted in bearings transversely of the machine, and adapted to be rotated by means of a hand-crank, F', or pulleys thereon. The two drums B B' are geared together by spur-wheels G G', so as to rotate in unison, and motion is imparted to them from the driving-shaft F by means of a pinion, F², on said shaft, which engages with an idler, F³, that is in engagement with the wheel G upon the shaft of the lower drum, B, as clearly shown in Figs. 1 and 2.

Upon the driving-shaft F are spur or sprocket wheels g, which engage with the pins of the lower chains, D, and thereby impart to them a positive forward movement. The blades of the chains D' intermesh with those of the chains D, and as the latter chains are moved positively the former chains must also move correspondingly. In order, however, to make the movements of the two chains of each pair perfectly synchronous, I gear together the rotary bars or shafts c and e, which support the two chains of each pair at the entrance end of the machine, as clearly shown in Fig. 4. Upon the end of the shafts c and e are corresponding spur-wheels h, which are caused to rotate at equal speed by idler-wheels h', which are supported in swinging bearings h², to cause them to keep in gear with the wheels h as the rotary shaft e is moved toward or from the shaft c, as previously described.

The portions of the shafts c and e upon which the chains D D' bear are made four-sided or square, with concave faces, to adapt them to the lugs or ears b' of the chain-links, as seen in Fig. 4, or of polygonal form, with concave sides, as seen in Fig. 1; and as the chains D are moved positively they will rotate the shaft c, which motion is transmitted to the shaft e, as previously described. The shaft e, being square or polygonal, will engage with the chains D' and cause the latter to move in unison with the chains D.

The material to be fluted is fed into the machine over a bed or table, H, by means of feeding-wheels H', which are toothed to act effectively upon the material, and are fixed to a shaft, I, which is adapted to rotate in bearings I' on opposite sides of the machine. Where the shafts over which the chains pass are four-sided, as in Fig. 4, the blades of the chains afford a wider opening between them, and are adapted to receive a greater quantity of material than they would if said shafts had six sides, as shown in Fig. 1.

The shaft e' at the exit end of the machine has upon it a gear-wheel, J, which gears with and receives motion from a corresponding wheel, J', upon the driving-shaft F, as seen in Figs. 2 and 3. Upon the opposite end of the shaft e' is a large cone-pulley, J², from which a belt, J³, passes to a corresponding pulley, J⁴, of smaller size, upon the shaft I. Motion is thus imparted to the feed-wheel shaft I, and to vary the speed of the feed-wheels and the

entrance of material into the machine all that is necessary is to shift the belt J³ upon the pulleys J² J⁴ to get the desired speed.

In order to take up all slack in the belt J³ at all times, I make it of considerable length and carry it downward between the pulleys J² J⁴ over an idler, K, which is journaled in a weighted lever, K', which is fulcrumed at i, as seen clearly in Fig. 1.

In the operation of my machine the strip of fabric L, which has been previously creased or fluted in a separate machine, is fed over the table H and under the feed-wheels H', by which it is carried forward continuously into the machine. Upon the table H are guides M, under the edges of which the fabric passes, and by which it is guided laterally, and also under the feed-wheels H'.

Projecting downward from the inner edge of the table H is an apron, H², which is curved to conform closely to the path traveled by the lower chains, D, and which prevents the fabric from passing down under the said lower chains.

N designates guides, which are shown as consisting of bent metal rods, secured at j in the frame of the machine and extending forward between the feed-wheels H' and between the chains D D', but just about on a level with the tips of the blades b of the lower chains, D. These guides hold the flutes of the fabric down upon the blades of the lower chains as they are formed by the intermeshing blades of the upper chains, as clearly seen in Fig. 1. The strip of fabric is additionally guided laterally by guides o, which are adjustable toward and from each other upon a transverse bar, O', by means of screws k, as best seen in Figs. 2 and 3. The fabric passes between the guides O, which should be adjusted to such a distance apart as will allow of its easy passage between them.

P designates gas-pipes leading to opposite sides of the machine to open air-chambers P', from which the mixture of gas and air passes upward through pipes P² to the two drums B B', in which it is consumed in properly-constructed burners, thus heating the drums.

If desirable, steam might be used in place of gas for heating the drums. The fabric fed forward by the feeding-wheels H' passes between the chains of the two pairs, and is thereby fluted, while the middle portion is flattened and pressed down by the rollers B², thus producing a fabric having a flat middle portion and fluted marginal portions, and which may be formed into neck-ruchings by dividing it longitudinally through the flattened middle portion and transversely to form proper lengths.

If desirable, paste-threads may be conducted between the rollers B² and stuck to the flattened middle portion of the fluted fabric, and in Fig. 1 I have represented paste-boxes l, from which threads covered with adhesive substance may be conducted to the upper and un-

der sides of the fabric, and pressed down upon the fabric by the rollers B².

The paste-boxes and their appurtenances form no part of my invention. As clearly shown in Fig. 1, the lower chains, D, of the two pairs are extended considerably beyond the upper chains, D', and I have arranged between the two pairs of chains a stationary incline, M, upon which the fluted fabric slides, and by which its flutes are raised out from between the blades b of the lower chains, D. From this machine the fluted fabric is delivered to any other machine, wherein it is slitted or cut longitudinally at the center of the width of the flattened and pressed middle portion to form neck-ruchings.

By my invention I remove one great objection hitherto experienced in the use of chain-fluting machines.

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

1. In a machine for making ruchings, the combination of two pressing-rollers, arranged one above the other, between which the fabric passes, and by which the middle portion of the fabric is flattened or pressed, and pairs of endless intermeshing fluting-chains on opposite sides of said rollers for fluting the marginal portions of the fabric, all arranged and operating substantially as herein specified.

2. In a machine for making neck-ruchings, one or more pairs of endless intermeshing fluting-chains, which diverge gradually toward the exit end of the machine, substantially as and for the purpose specified.

3. In a machine for making neck-ruchings, the combination of pressing-rollers and pairs of endless intermeshing fluting-chains on opposite sides of said rollers, the chains of each pair being so arranged as to diverge gradually toward the exit end of the machine, substantially as specified.

4. In a machine for making neck-ruchings, the combination of one or more pairs of endless intermeshing fluting-chains, a feed-table, feeding-wheels for feeding the fabric over said table between the chains, and means for varying the speed of said feeding-wheels relatively to the speed of said chains, substantially as specified.

5. The combination, with a fluting-chain, of a rotary shaft, e, over which the chain passes, swinging links or bars E, pivoted at one end, f, and having bearings for said shaft at their other or free ends, and the springs f' and adjusting-screws f², for raising and lowering said links or bars and shaft, all substantially as specified.

6. The combination of the chains D D', the feed-table H, the feeding-wheels H', and the guards N, substantially as specified.

7. The combination of the shorter upper chains, D', the longer lower chains, D, and the stationary inclines M, substantially as and for the purpose specified.

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