

(No Model.)

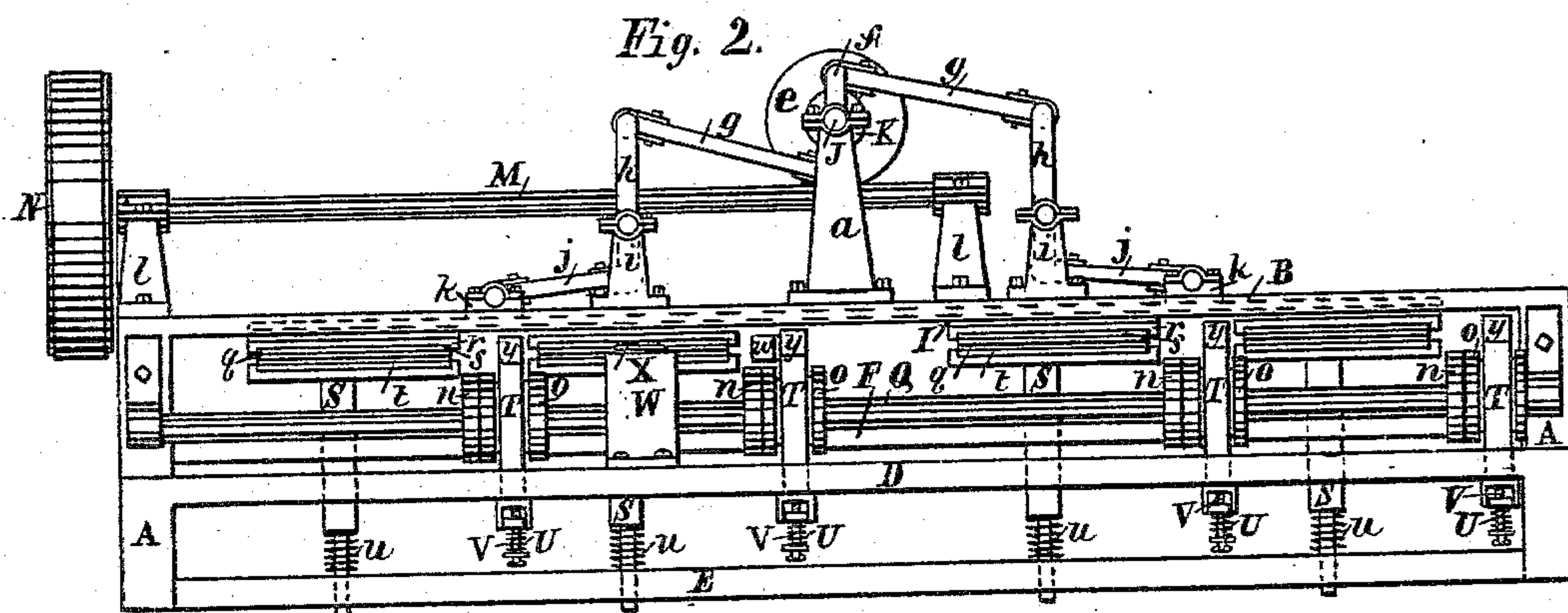
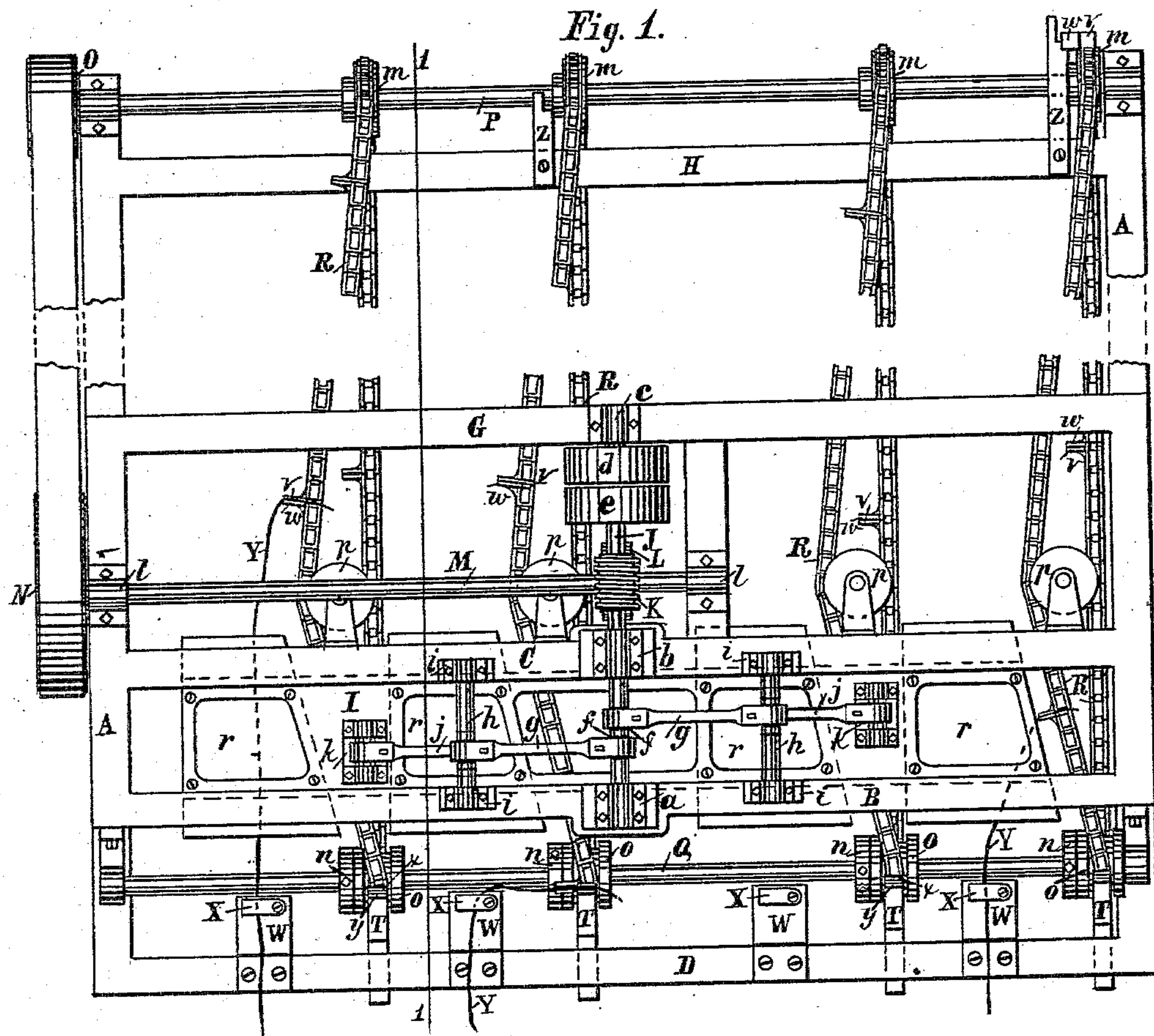
2 Sheets—Sheet 1.

J. A. SMITH.

MACHINE FOR ROLLING LEATHER STRINGS.

No. 287,970.

Patented Nov. 6, 1883.



Attest;

Louis Cohen,
Joseph Selig.

Inventor;

James A. Smith,
per Edw. Summer, Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

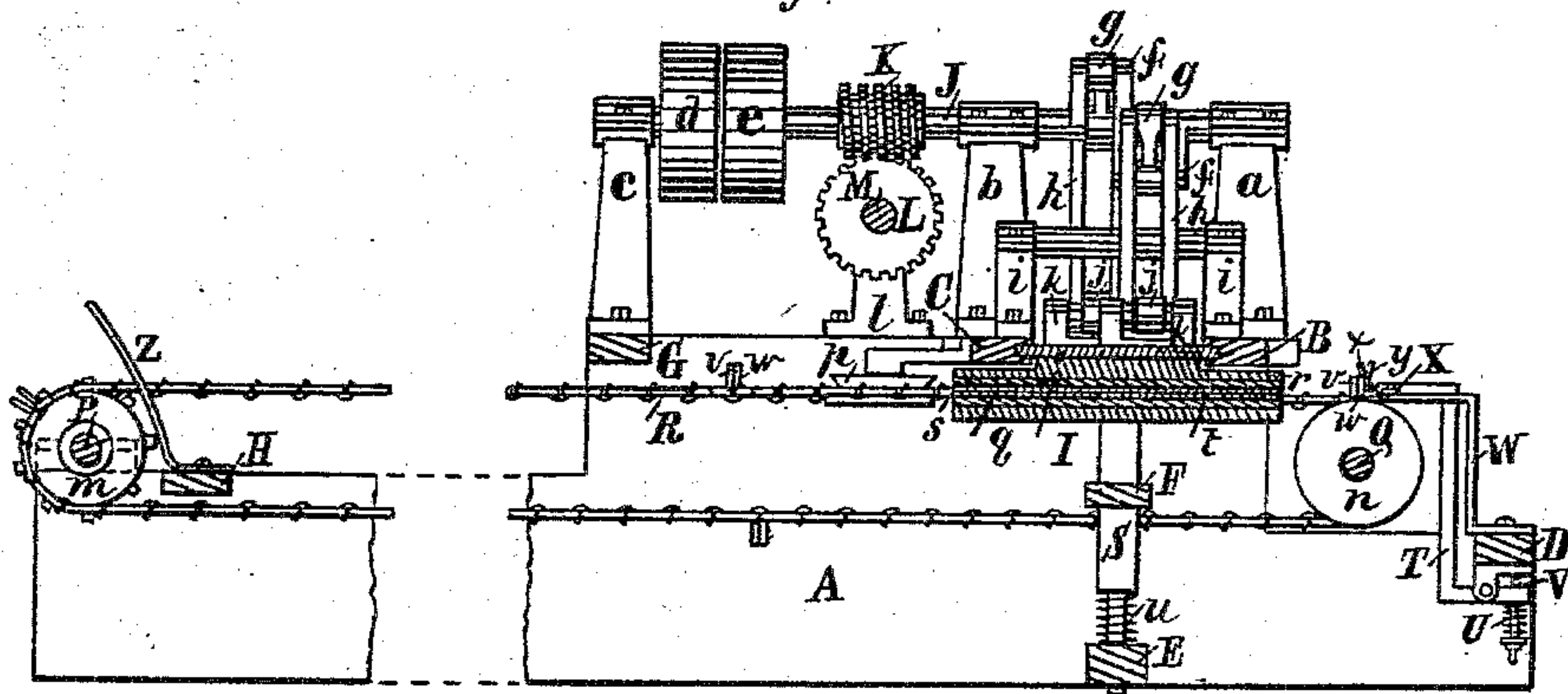


Fig. 4.

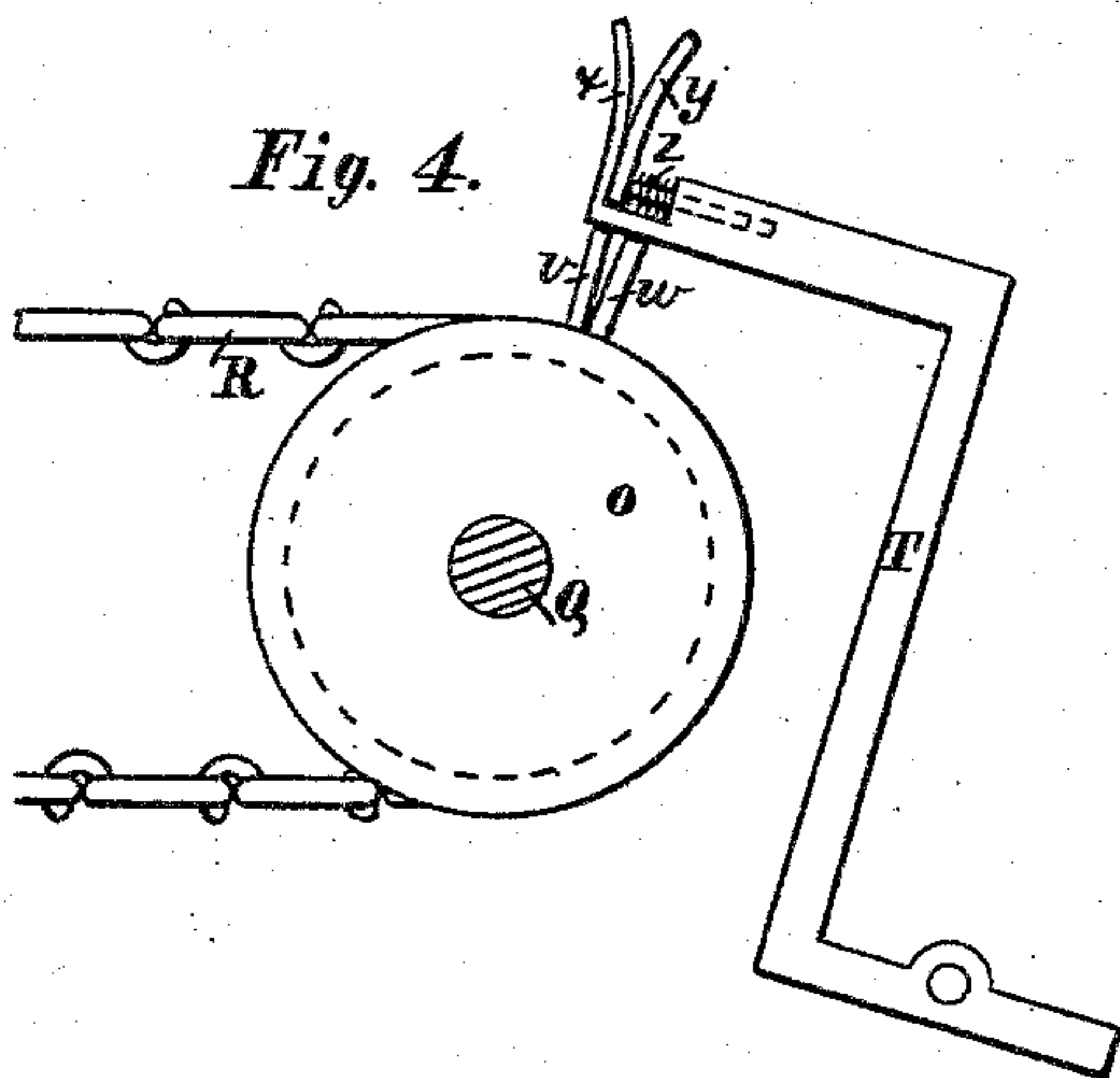


Fig. 5.

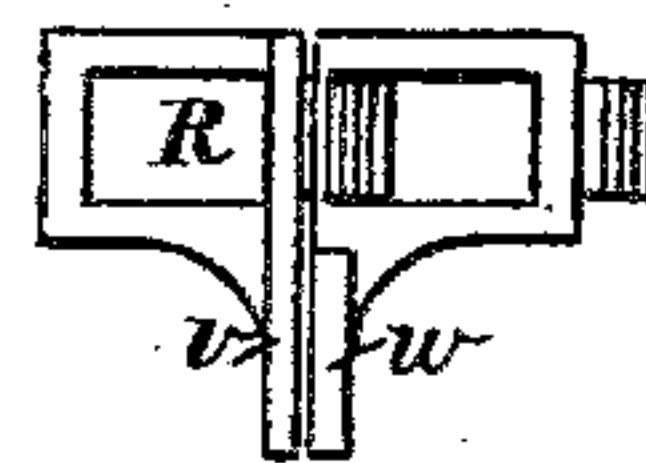
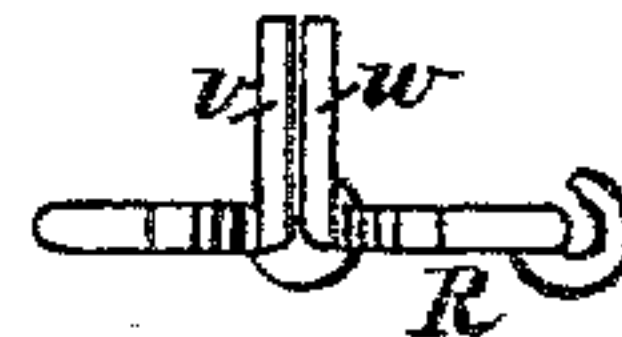


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES A. SMITH, OF HOLBROOK, MASSACHUSETTS, ASSIGNOR TO E. NEWTON THAYER, OF SAME PLACE.

MACHINE FOR ROLLING LEATHER STRINGS.

SPECIFICATION forming part of Letters Patent No. 287,970, dated November 6, 1883.

Application filed April 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. SMITH, a citizen of the United States, residing at Holbrook, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Rolling Leather Strings, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a machine for rolling and finishing leather strings; and it consists in the construction, arrangement, and combination of the several parts of the machine, as hereinafter set forth, and specifically pointed out in the claims.

Leather strings—adapted especially for shoe-lacings—are first cut from the leather as strips square or rectangular in cross-section. These strips are commonly finished by rolling them between the surfaces of two boards or plates suitably pressed toward each other. Such rolling operation makes the strings round, even, and smooth. It is the purpose of my invention to render this operation as simple and rapid as possible, particular attention having been given to the feeding mechanism, so that strings of any and of great length may be readily rolled, and that the hand-labor of feeding and attendance may be reduced to a minimum.

In the drawings—two sheets—Figure 1 is a plan view of so much of a machine embodying my invention as serves for illustration of the same. Fig. 2 is a front elevation. Fig. 3 is a vertical section taken on the line 1 1 in Fig. 1. Figs. 4, 5, and 6 show some of the details.

The end supports, A A, and connecting-rails B, C, D, E, F, G, and H form the frame of the machine. The frame may be formed to be quite different from that shown, provided it be such as to support the working parts, constructed and located with reference to each other to produce the results substantially as herein specified.

The rails B and C provide or support ways or guides for the sliding plate or frame I. This plate or frame should be made as light as possible and have the required strength.

Supported in suitable bearings on stands *a*, *b*, and *c* is a shaft, J, located transversely to the plate or frame I. On this shaft is a pulley,

d, fixed thereon, and a loose pulley, *e*, to receive the belt by which motive power is supplied for the whole machine. On the shaft J are fixed two cranks, *f*, to each of which is pivoted one end of a connecting-rod, *g*, the other end of the connecting-rod being pivoted to a rocking bar, *h*, at the upper end thereof. Each rocking bar is pivoted to fixed stands *i*, and has pivoted thereto one end of a connecting-rod, *j*. Each of the connecting-rods *j* is pivoted at the other end to a stand, *k*, fixed on the plate or frame I.

On the shaft J is fastened a worm, K, which works in a worm-gear, L, fixed on a shaft, M. This shaft is supported in suitable bearings on stands *l*, transversely to the shaft J. On the outer end of the shaft M is a pulley, N. A belt about this pulley passes also about a pulley, O, on a shaft, P, supported at the rear of the machine and longitudinally therewith, having fixed thereon spur-wheels *m*.

At the front of the machine a longitudinal rod, Q, is fixed, on which are collars *n*, which may be adjusted and fastened in the required positions on this rod. Grooved pulleys *o* are adapted to revolve on the rod Q, being in operation caused to bear against the collars *n*. About each pulley *o* and its appropriate spur-wheel *m* passes an endless chain, R. Each chain extends directly, as to the lower part, from a pulley, *o*, to a spur-wheel, *m*, while the upper part is bent out of a straight line by a grooved pulley, *p*, which has a groove formed as shown, the lower part of the groove being in a plane at right angles to the axis of the pulley, and the upper part inclined thereto, whereby the chain is kept in the required position.

To the under side of the plate or frame I is secured a plate, *q*, by preference fastened to a plate, *r*, secured directly to the frame I, and separable therefrom, there being an intermediate plate or board, *s*, between the plate *q* and the plate *r*. The plate *q* is metallic, while the plate *s* is of wood or other softer or somewhat elastic material. A plate, *t*, is supported under each plate *q* by a standard, S, and is secured to the standard, there being an intervening plate like the plate *s*. Each standard S may move vertically, being guided in

openings in the rails E and F, and is pressed upward by a spring, *u*.

Each chain R is by preference of a construction well known, having rectangular links, as shown. To the chain I fasten fingers, each of which may be formed as one piece with a link. A pair of fingers form nippers adapted to grasp and hold a string. One finger, *v*, of a pair is a flat metallic piece joined to a link, so as to extend across and above the chain and to a distance from the side or edge of the link, while the other finger, *w*, extends only above and to one side of the chain, and so as to be opposite to the corresponding part of the finger *v*. The two fingers forming a pair are at the adjacent ends of two links, as shown.

To the rail D are pivoted arms T, each supporting a pair of nippers directly over a chain as it passes over the upper side of a pulley, *o*. Each pair of these nippers is formed by a finger, *x*, fixed to an arm, T, and a finger, *y*, which may slide to and from the finger *x*, being pressed toward the finger *x* by a spring, *z*. There is a spring, U, which acts to swing an arm, T, and carry the nippers *x y* down toward the chain, and a screw, V, by which the distance of such motion of the arm and nippers may be gaged.

Standards W (only one of which is shown in Fig. 2) are fastened on the rail D, each one of which has fixed thereon a spring plate or wire, X, as shown.

In operation, the revolution of the shaft J causes, by means of the worm K and gear L, a much slower revolution of the shaft M, and by means of the pulleys N and O and the belt a suitable revolution of the spur-wheels *m*. Thus the chains R are moved, so that the upper parts thereof travel toward the rear of the machine. The revolution of the shaft J also causes, by means of the cranks *f*, connecting-rods, and rocking bars, the plate or frame I to have a rapid reciprocating movement. Thus the plates *q* are moved rapidly to and fro on the plates *t*. One end of a string, Y, is inserted by hand between the parts of any pair of nippers *x y*, and the string is drawn around under a spring-plate, X. When a finger or piece, *v*, moves under the arm T, it raises the arm and nippers attached thereto, as shown in Fig. 4; but as soon as the piece *v* passes from under the arm T this arm and the nippers *x y* drop into such position as to carry the string between the fingers *v* and *w*. These fingers are at a distance apart when the links to which they are attached pass about a pulley, but are close together when said links are in the same plane; hence the fingers *v* and *w* grasp the string and hold it with sufficient force to pull it out from between the nippers *x y*. The chain is so directed by a pulley, *p*, that it draws the string, which is drawn somewhat taut by the spring-plate X, between the plates *q* and *t*, the string being carried along between these plates, while the plate *q* has a rapid reciprocating movement

on the plate *t*, and as these plates are pressed together it is rolled and finished as required. When the nippers on the chain pass over a spur-wheel, *m*, the fingers thereof separate sufficiently to allow the end of the string to drop out.

Of the adjacent surfaces of the plates *q* and *t*, the forward part of each surface is by preference made rough or grooved, while the rear part is smooth. Each plate may be of two separable parts, one having a rough or grooved surface and the other part a smooth surface.

I have represented only four sets of plates *q* and *t*; but the machine may be of a length to have as many sets as required, all of the upper plates being attached to one sliding plate or frame, I. By having the shaft P at the necessary distance from the plates *q* and *t*, strings of any desired length may be drawn through between these plates. By employing the rocking bars *h*, I relieve the plate or frame I of that weight and pressure which it would have were the connecting-rods *g*—which, in a long machine, must be proportionately long—pivoted directly to the stands on said plate or frame.

To prevent the strings from being carried over the shaft P or caught and held from dropping away from the chains or other moving parts of the machine, I so secure an elastic piece of metal or spring, Z, as on the rail H, in such position with reference to a spur-wheel, *m*, as to be bent by the nippers *v w* down under these nippers, and then be allowed to spring back, so as to throw the string away from the chain, spur-wheel, and shaft.

I claim as my invention—

1. In a leather-string-rolling machine, the combination of a carrying-chain and suitable pulleys therefor with plates *q* and *t*, adapted to operate substantially as hereinbefore set forth.

2. The combination of a chain, R, spur-wheel *m*, pulley *o*, and pulley *p*, for bending the chain out of a straight line between said pulley *o* and spur-wheel *m*, substantially as and for the purpose specified.

3. The combination of a shaft, J, having one or two cranks, *f*, connecting rod or rods *g*, one or two rocking bars, *h*, connecting rod or rods *j*, and sliding plate or frame I, substantially as and for the purpose set forth.

4. In combination with a chain, fingers *v* and *w*, forming nippers, substantially as specified.

5. A finger, *v*, extending across the chain and to one side thereof, and a finger, *w*, extending to one side of the chain and opposite the corresponding part of the finger *v*, to form nippers, in combination with two adjacent links of a chain, substantially as set forth.

6. In a leather-string-rolling machine, an arm, T, adapted to swing, and having nippers *x y*, substantially as specified.

7. In a leather-string-rolling machine, a plate, *q*, adapted to reciprocate, in combination with a plate, *t*, adapted to be pressed

against the plate *q*, standard *S*, and spring *u*, substantially as set forth.

5 8. Plates *q* and *t*—one to reciprocate and the other pressed toward the former—and a plate of softer or somewhat elastic material, as wood, intervening between either of plates *q* and *t* and its support, in combination with a chain, *R*, substantially as and for the purpose set forth.

9. The combination of nippers *v w* and chain 10 bearing the same, nippers *x y*, pivoted by means of an arm, *T*, and spring and friction plate or wire *X*, substantially as and for the purposes set forth.

JAMES A. SMITH.

Witnesses:

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EDW. DUMMER.