

J. B. Wilson.

Sheet 1, of 2 Sheets.

Knife Grinding Mach.

N^o 96,756

Patented Nov. 9, 1869.

Fig. 1.

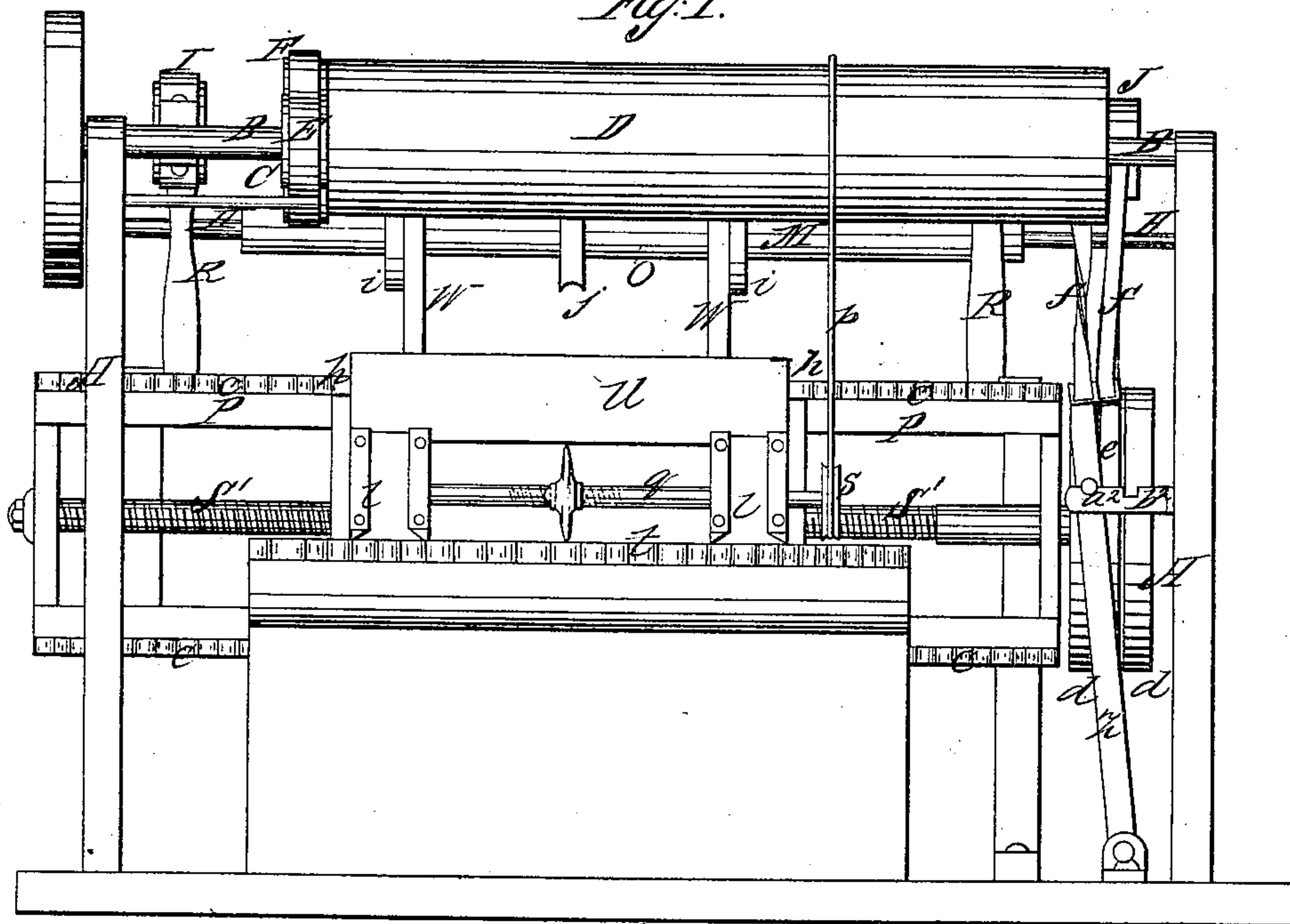
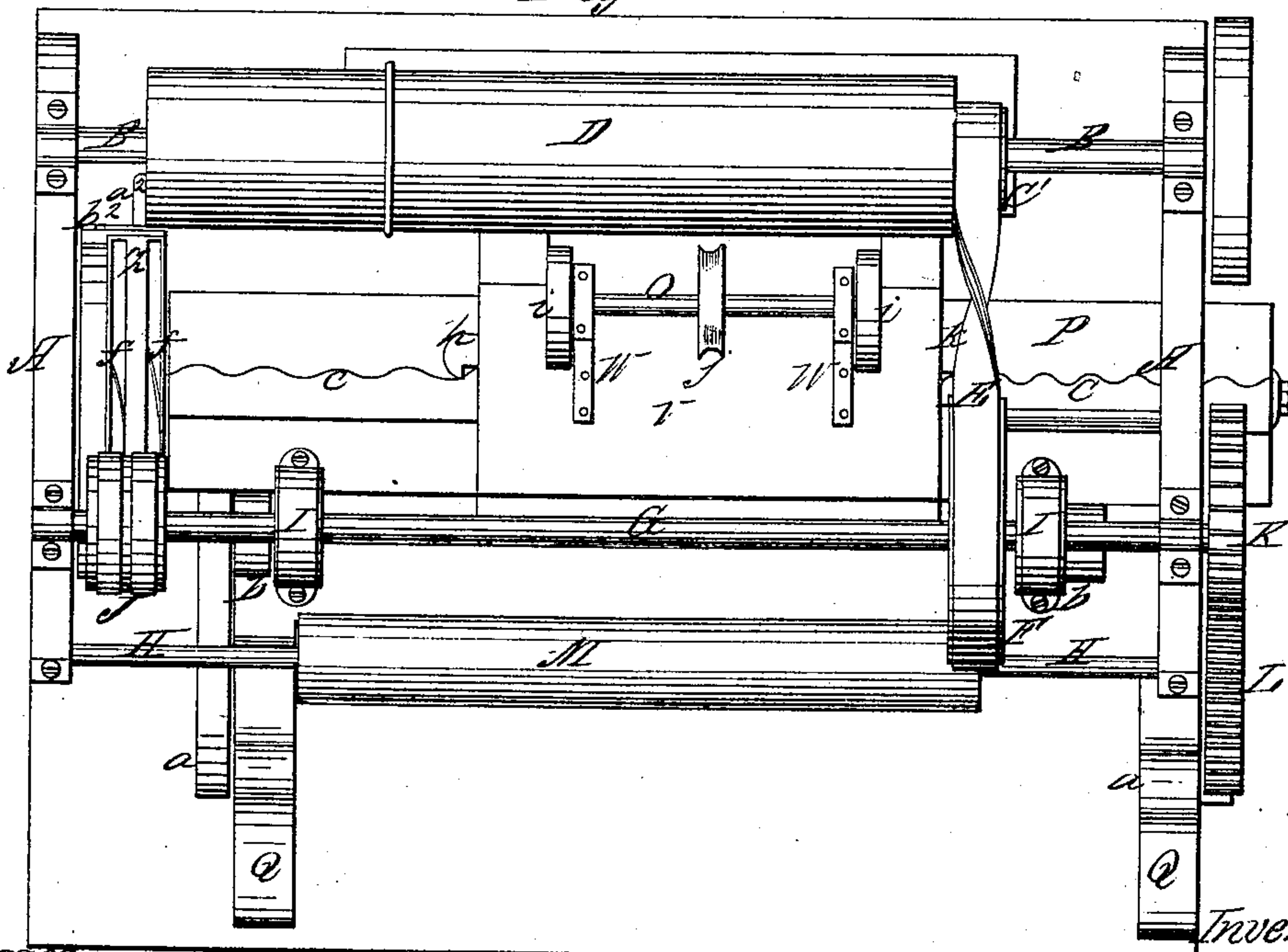


Fig. 2.



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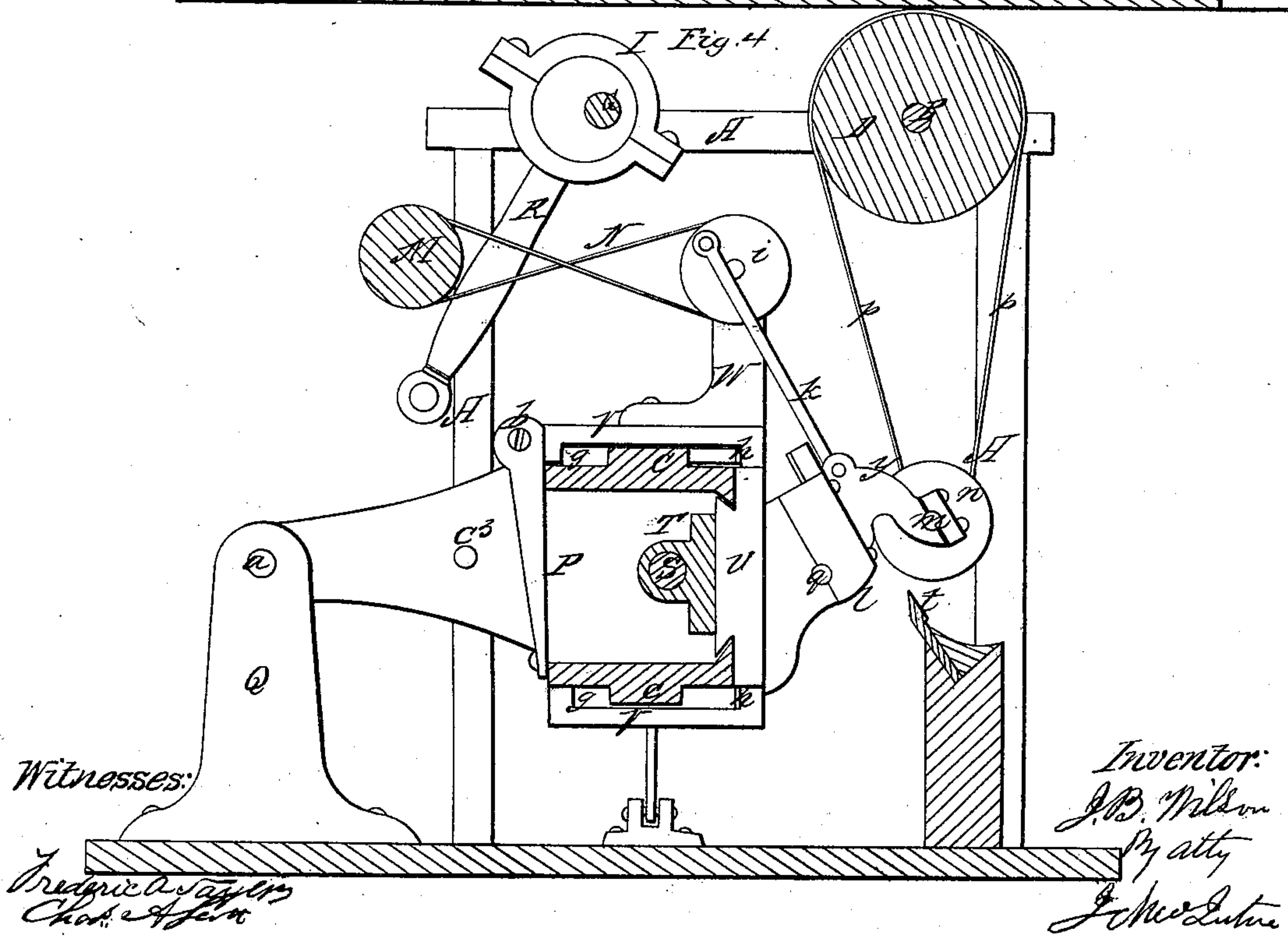
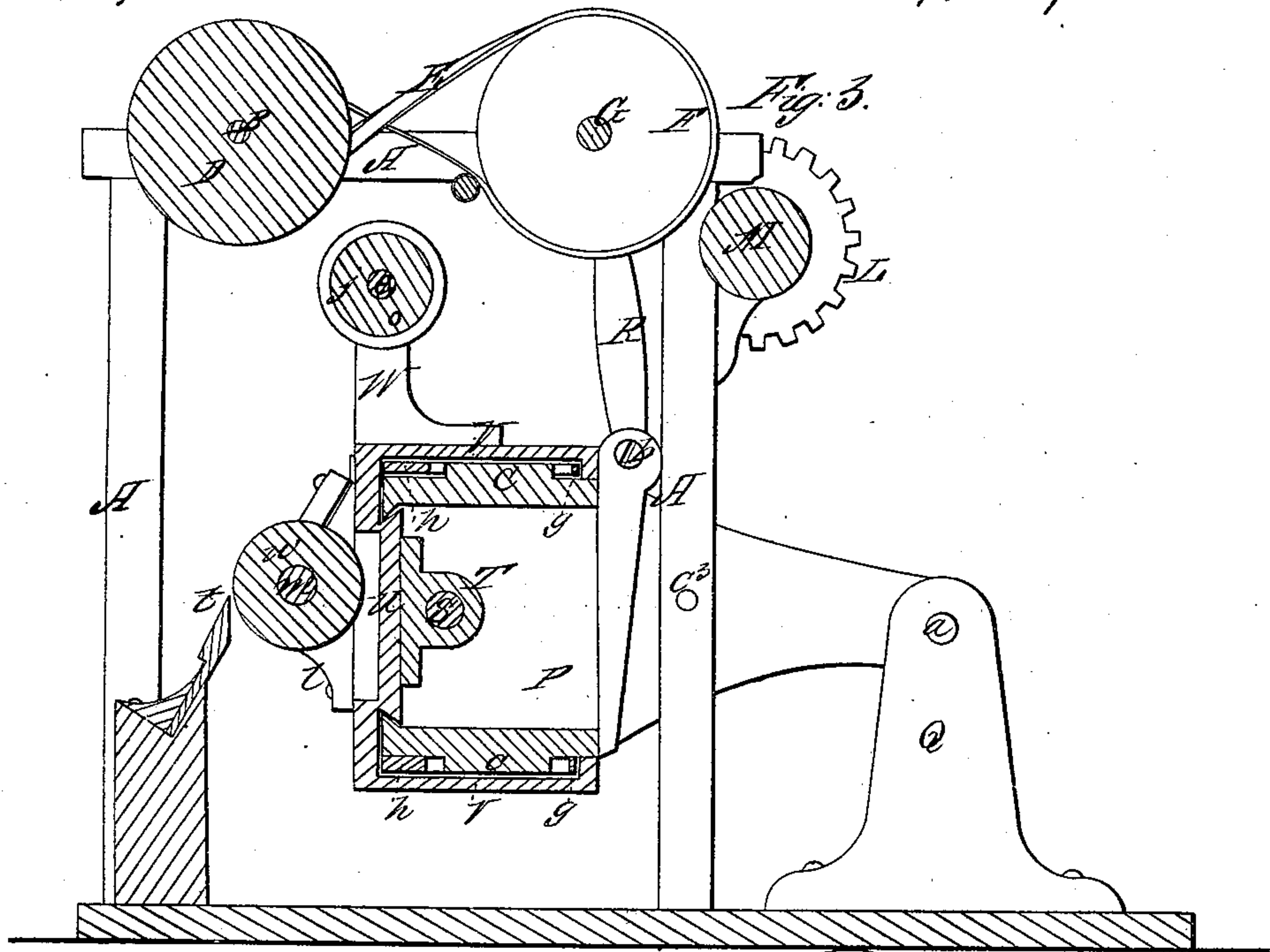
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Fig. 5.

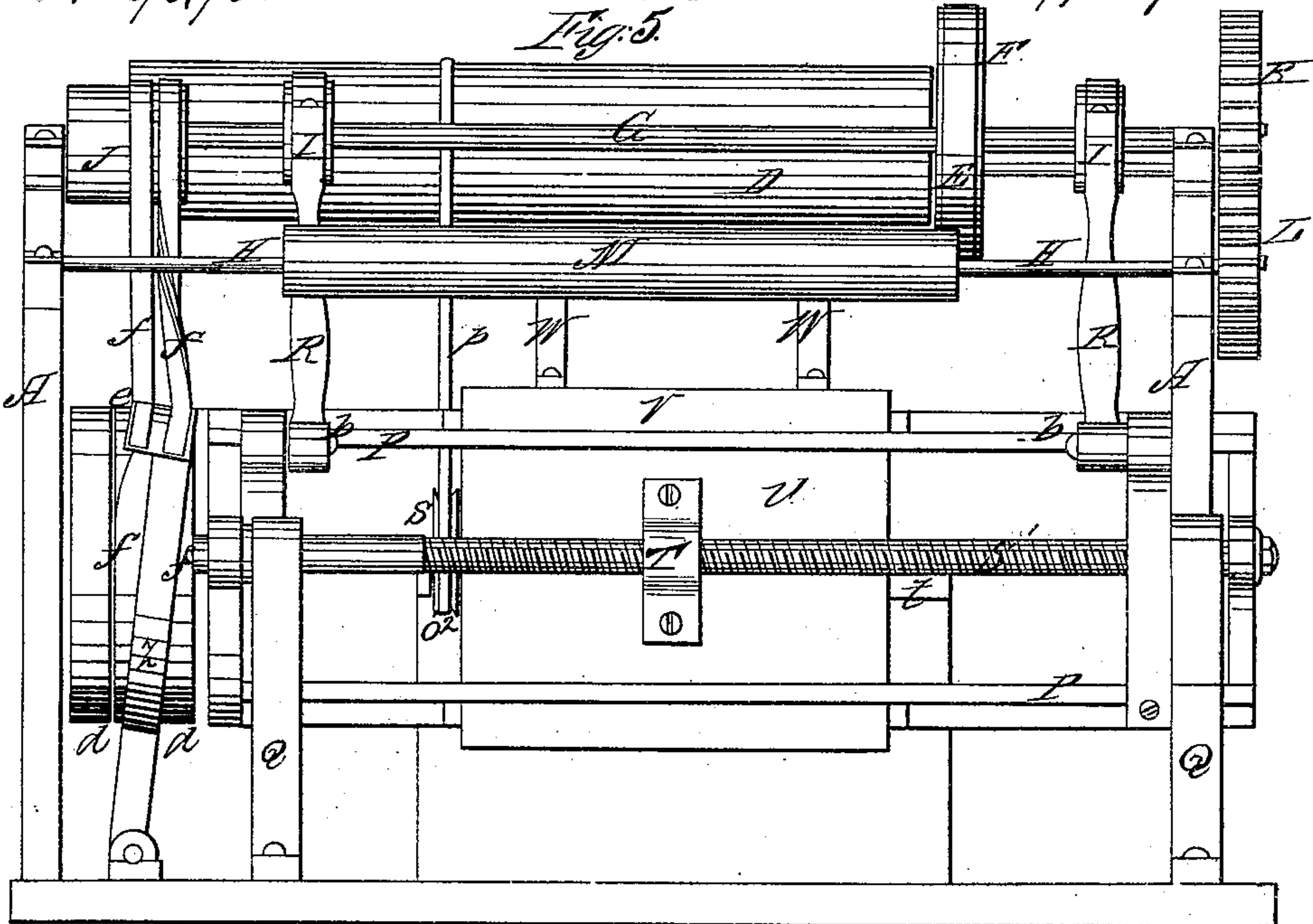


Fig. 7.

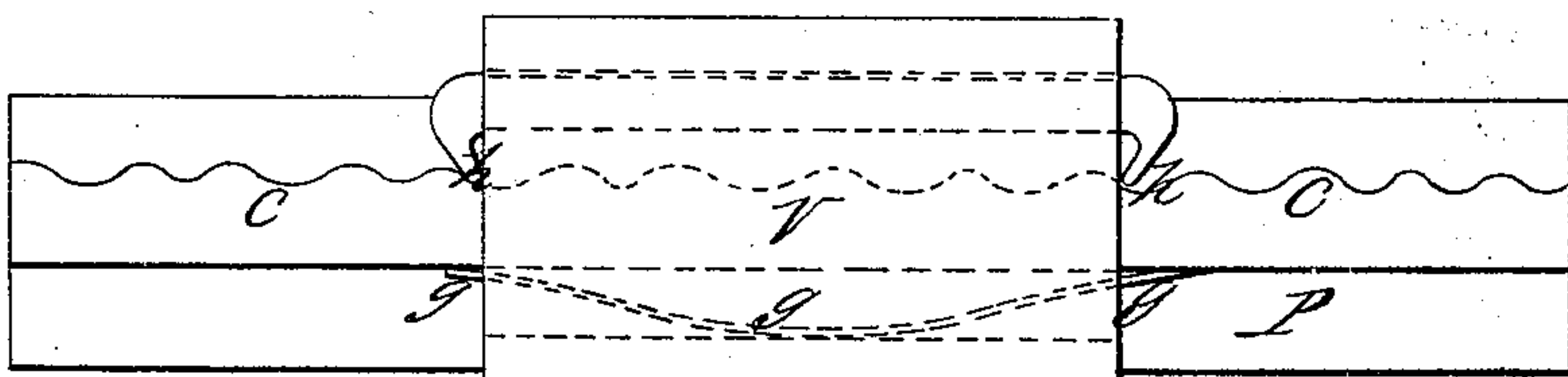
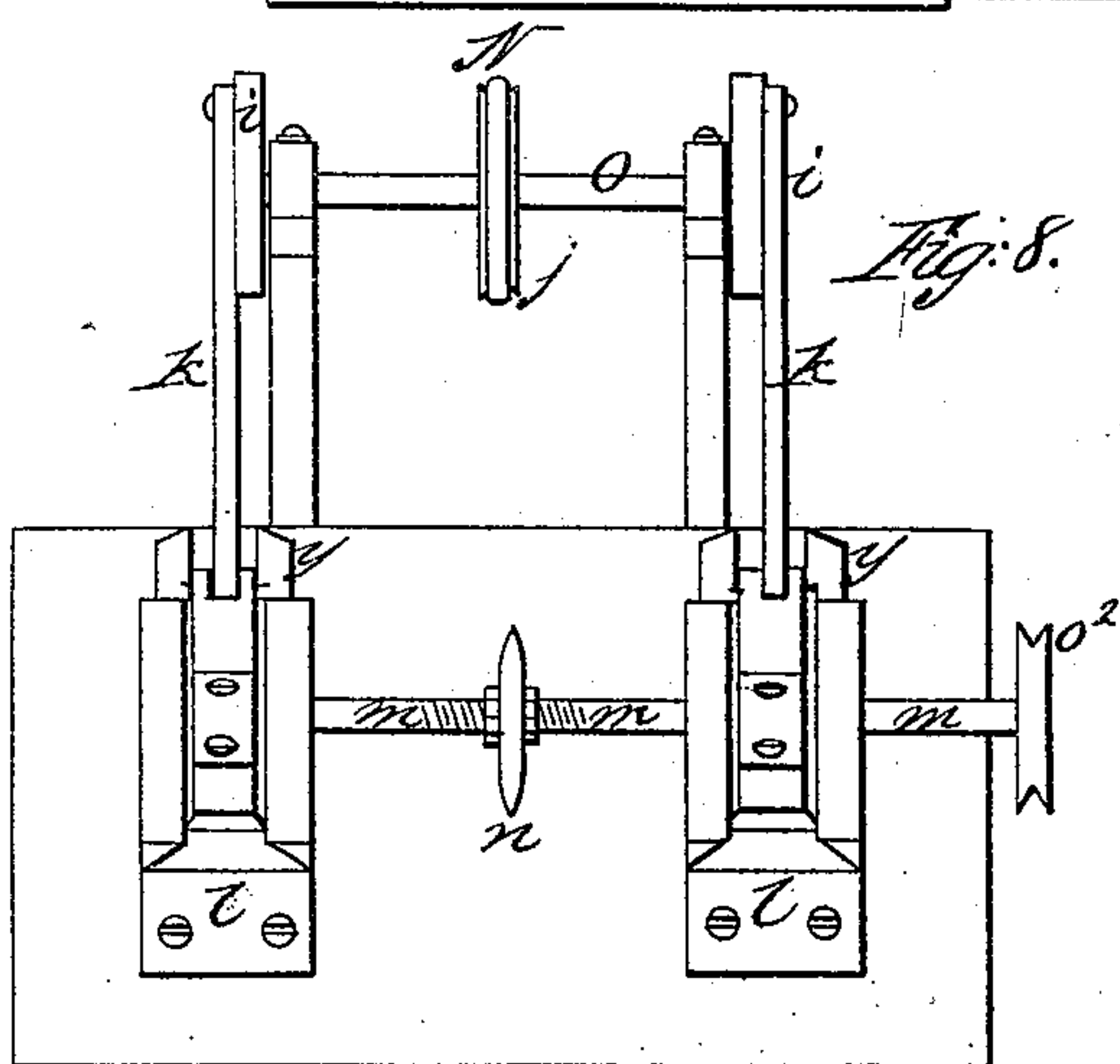


Fig. 8.



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Sheet 4, 4 Sheets.

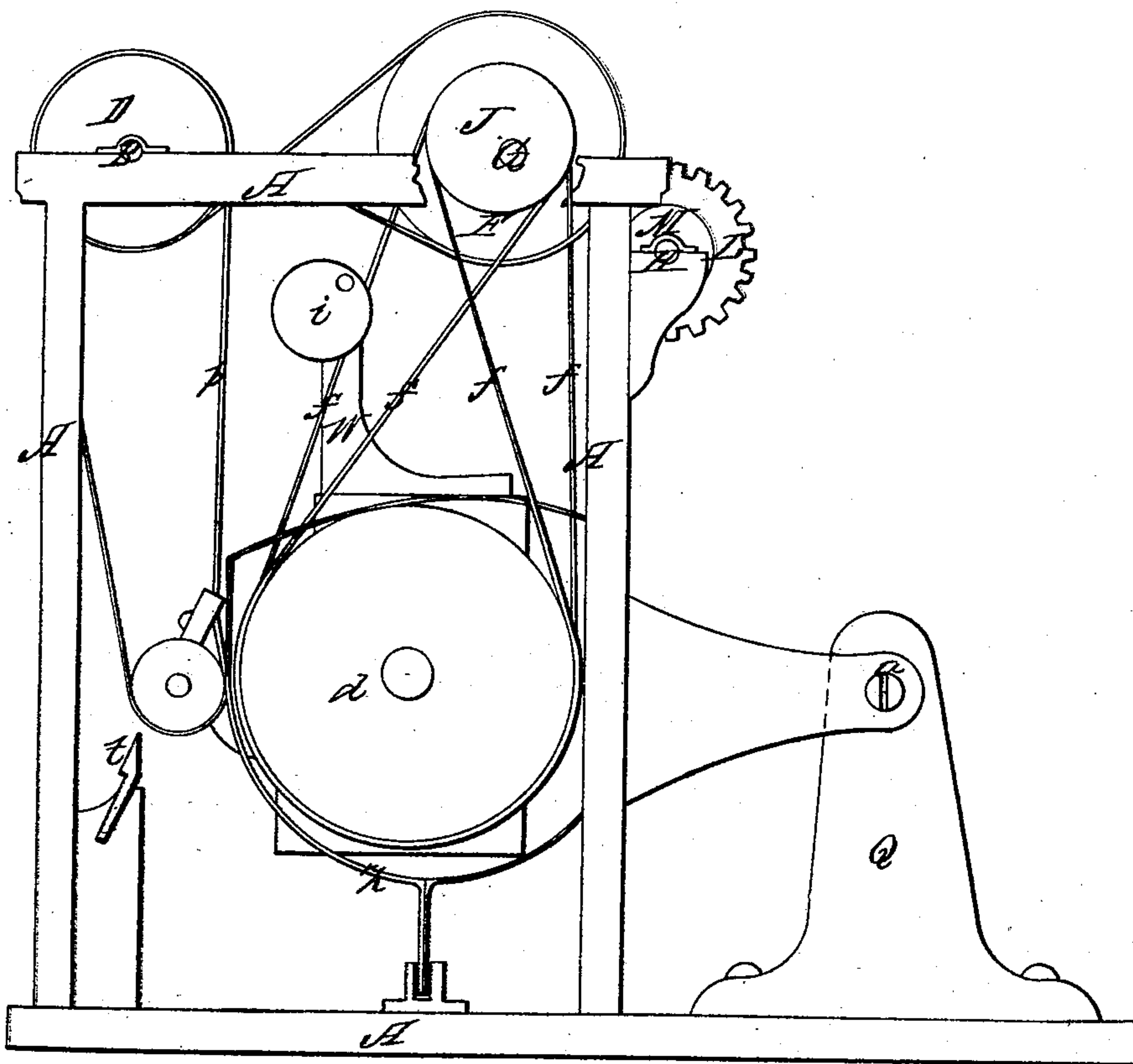
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Fig: 6.



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United States Patent Office.

JOHN B. WILSON, OF NEW YORK, N. Y.

Letters Patent No. 96,756, dated November 9, 1869.

IMPROVEMENT IN MACHINE FOR GRINDING CORRUGATED KNIVES.

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, JOHN B. WILSON, of New York city, of New York county, and in the State of New York, have invented a certain new and useful "Machine for Cutting and Grinding Corrugated Knives;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to a machine or apparatus for grinding or cutting corrugated knives, such as used according to Letters Patent granted to me on the 19th day of March, 1867, for cutting corrugated veneers, or other irregularly-shaped cutters, and has for its object an organized mechanism, by means of which the straight and bevelled surfaces or edges of any zigzag or corrugated knife or cutter may be perfectly cut and sharpened; and to this end,

My invention consists in the employment of a suitable cutter or grinder, in combination with a compound carriage, and a suitable former, by means of which the cutter or grinder, as it runs in contact with the stock to be cut or sharpened, is moved up and down over the face of the stock, and fed along in the direction of the length of the blade or stock, in a zigzag path of motion, corresponding exactly to the corrugated shape to be imparted to the said stock or knife, as will be hereinafter more fully explained; and

My invention further consists in the employment, in combination with a carriage which moves along in the direction of the length of the knife or stock being operated upon, and with a zigzag motion, of a carriage, which moves in a plane parallel to a plane across the face of the knife, and provided with a suitable rotary cutter or grinder, for operating on the opposite or other face of the knife, all as hereinafter more fully described.

To enable those skilled in the art to make and use my invention, I will proceed to describe the construction and operation of my new machine, referring by letters to the accompanying drawings, in which—

Figure 1 is a front elevation;

Figure 2, a top view;

Figure 3, a vertical cross-section, at *x x*, fig. 2;

Figure 4, a similar section at *y y*, fig. 2;

Figure 5, a rear elevation;

Figure 6, an end view;

Figure 7, top detail view of carriage and former; and

Figure 8, skeleton detail view.

In the several figures, the same parts will be found designated by the same letters of reference.

A represents the frame of the machine, which may be changed in any suitable manner, for the support of the shafts and working-parts.

B is the main driving-shaft, to which the motive-power is applied, and which is provided with a pulley, C, and drum D, from which pass belts to the different shafts to be driven.

From the pulley C passes a belt, E, to a pulley, F, on shaft G, which, like the main shaft B, and another shaft, H, is mounted in suitable bearings or boxes on the main frame A.

The shaft G carries the eccentrics I I, which operate a vibratory carriage, and also an eccentric drum, J, from which pass belts to drive pulleys on said carriage, as will be presently described, and is provided with a spur-gear, K, which meshes into a gear, L, on the shaft H, and drives the latter.

The shaft H carries a drum, M, from which runs the belt N, that drives the shaft O, as and for purposes to be explained.

P is a vibratory carriage, which is hung on pivots at *a a*, in vertical standards Q Q, and which is vibrated, or moved up and down by means of pitmen R R, pivoted to it at *b b*; and extending up to the eccentrics I I.

This carriage P is provided on its upper and lower faces with formers *c c*, and has a screw-shaft, S, running through it, which is provided at one end with two fast pulleys, *d d*, and a loose pulley, *e*, which are driven by the belts *f f*, from drum J, and effect the rotation alternately in opposite directions of the screw-shaft S, and this shaft passing through a lug, T, projecting from the back of a carriage, U, feeds the latter along, or causes it to slowly traverse back and forth on the carriage P.

This carriage U has combined or arranged with it another carriage, V, which, while it is obliged to travel along with carriage U, is free to play in and out at right angles to the line of travel of both, and is moved in and out by means of the formers *c c*, in one direction, and springs *g*, in the other direction.

h h are bearing-points or projections, projecting from the carriage V into the corrugations of the formers *c c*.

The carriage V is provided on top with two standards, W W, in which, in suitable bearings, is hung a horizontal shaft, O, provided at each end with a crank-plate, *i*, and near its middle, with a pulley, J, which is driven by a belt, N, from drum M.

From each of the crank-plates *i* extends downward a pitman, *k*, and these pitmen *k k* impart a reciprocatory motion to the carriages *y y*, which are arranged to slide in ways in the stands *l l*, and these

carriages *y y* are provided with a horizontal shaft, *m*, on which is hung a grinder or cutter, *n*, and which is driven, through the medium of a pulley, *o*², by a belt, *p*, passing from said pulley up to the main drum *D*.

In the stands *l l* is hung another horizontal shaft, *q*, which carries another cutter, *w*, and which is also driven, from the drum *D*, by means of its pulley *s* and the belt *p*.

These shafts and their grinders being used always separately, or at different times, one to operate on one side of the knife, and the other on the other, the belt *p* is lifted from the pulley of one to that of the other, as occasion requires.

t is the knife to be cut or sharpened, and which is supposed to be secured in the tool-stock or carriage of a veneer-cutting machine, in the usual manner, and so that it can be moved or adjusted, and set at any given relative distance from either of the cutters, and at the proper angles to be operated upon.

Z is a shipper, which is pivoted at its lower end, and so constructed and arranged, that by means of its handle *a*², and a spring latch-bar, *b*², the operator can ship, and cause to be held, the belts *f f*, in such manner as to run either of the pulleys *d d*, and one of these belts being crossed, and the other straight, the result of using them alternately on the fast pulleys *d d* is, that the screw-shaft *S* is rotated, in first one and then the other direction, to effect the traverse back and forth of carriage *U*.

I will now explain briefly the general operation of the machine, in connection with the description already given of its several parts.

As I have before remarked, only one of the grinders is used at the same time.

I will suppose the knife *t* and the parts *c* of the machine to be adjusted for cutting the bevel-edge of the knife, as illustrated at fig. 3. The cutter *n* being now not required, either the belt *N* is unshipped, or, better, the carriages *y*, with their shaft and pitmen, all removed.

The machine being set in motion from its main driving-shaft, and the belt *p* placed on pulley *s*, motion is imparted to the shaft *G*, and from it, by means of the eccentrics *I I*, and their pitmen *R R*, the vibratory carriage *P* is moved up and down, carrying with it all its attachments, and the cutter-shaft *q*, which, meanwhile, is rapidly rotated by means of the belt *p*, running from drum *D*.

Either the belt *p* should be elastic, or the drum *D* should be hung in rocking bearings, so as to move up and down like carriage *P*, to keep said belt always at the same tension. I have used the latter plan in my working-machine.

At the same time that the rapidly-revolving cutter is carried up and down, the carriages *U* and *V* are carried along during the length of the knife *t*, by means of the screw *S*, and the carriage *V* is forced to play in and out, toward and from the knife, by means of the corrugated formers *c c*, thus cutting the knife in a zigzag or corrugated form, in longitudinal section.

When the cutter has been carried the whole length of the knife in one direction, the operator ships the belts *f f*, and causes the carriages *U V* to travel in the opposite direction.

This compound motion of the rotating cutter, back and forth, during the length of the knife, up and down across its face, and in and out to form the corrugations, is continued, the knife being adjusted up to the cutter all the time, until this bevel-edge is cut or finished.

The shaft *q*, with its cutter *w*, is now removed; the shaft *m*, with its carriages *y y*, and pitmen *k k*, all put in working position; the belt *p* put on, and belt *N* shifted on to pulley *J*.

The carriage *P P* is then disconnected from its vibrating or driving-pitmen *R R*, and being set at the proper elevation, is securely locked in place. It may be either supported by a rest from below, or it may be locked to the frame by a pin passed through one or both its ends, into the main frame, as seen at *c*³, for instance, fig. 4.

The machine is now ready to cut the straight or opposite side of the knife *t*, and the latter being adjusted, as seen at fig. 4, the power is applied when motion is imparted through belt *E* to shaft *G*, thence, by gears *K L*, to shaft *H*, from the drum *M* of which, passes the belt *N*, to drive-shaft *O*.

The pitmen on this shaft drive the carriages *y y* up and down in their ways, and thus cause the cutter *n* to travel up and down in an oblique direction over the face of the knife *t*.

The ways are made at precisely the same angle or obliquity as the plane in which the face of the knife is arranged.

While the cutter *n n* is thus moved up and down across the obliquely-arranged face of the knife, the compound carriage *U V* is moved, as described before, by means of the screw-shaft and the corrugated formers, so as to feed the cutter along during the length of the knife, and in and out, to form the corrugations.

It will be seen, that by means of an organized machine, constructed and operating as I have explained, a corrugated knife may have both its faces cut and shaped in precisely the same curves, and that any irregular corrugations may be produced.

It will be understood, that inasmuch as the knife does not have to be reversed, it is immaterial whether the corrugations of the formers *c c* be regular or irregular, the opposite faces of the knife must necessarily be exactly alike, and produce a cutting-edge which will run in a plane. Since it is not material what shape or direction the corrugations of the formers assumes, it becomes easier and less expensive to produce these formers than if they had necessarily to be perfectly regular in their curves and depressions, as would be necessary were it attempted to reverse the position of the knife. In fact, I have found it practically impossible to make the former near enough to perfection to enable me to reverse the knife and cut both sides with the same cutter, without making an imperfect edge.

It will be understood that my machine may be adapted to producing all sorts of corrugated or irregularly-shaped tools or implements, and that many of the details of construction may be varied without departing from the mode of operation, which I believe to be entirely original, by which I am enabled to cut the opposite faces from the same formers, without reversing the position of the knife.

I do not, therefore, wish to be limited, in my claim of invention, to any particularity of detail, construction, and arrangement of the parts of the mechanism, so long as the machine involves the mode of operation described; but having fully explained my new machine or apparatus for cutting and grinding corrugated or irregularly-shaped tools or knives,

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

A machine, in which the opposite faces of the knife may be cut in precisely the same irregular form, and at an angle to each other in cross-section, without reversing the position of the knife, by means substantially such as and in the manner hereinbefore set forth.

In testimony whereof, I have hereunto set my hand and seal, this 2d day of March, 1869.

JOHN B. WILSON. [L. s.]

Witnesses:

FREDERIC A. SAYER,
CHAS. A. SCOTT.