

No. 705,631.

Patented July 29, 1902.

M. ANTHONY.  
PRINTING PRESS.

(Application filed May 11, 1897.)

(No Model.)

4 Sheets—Sheet 1.

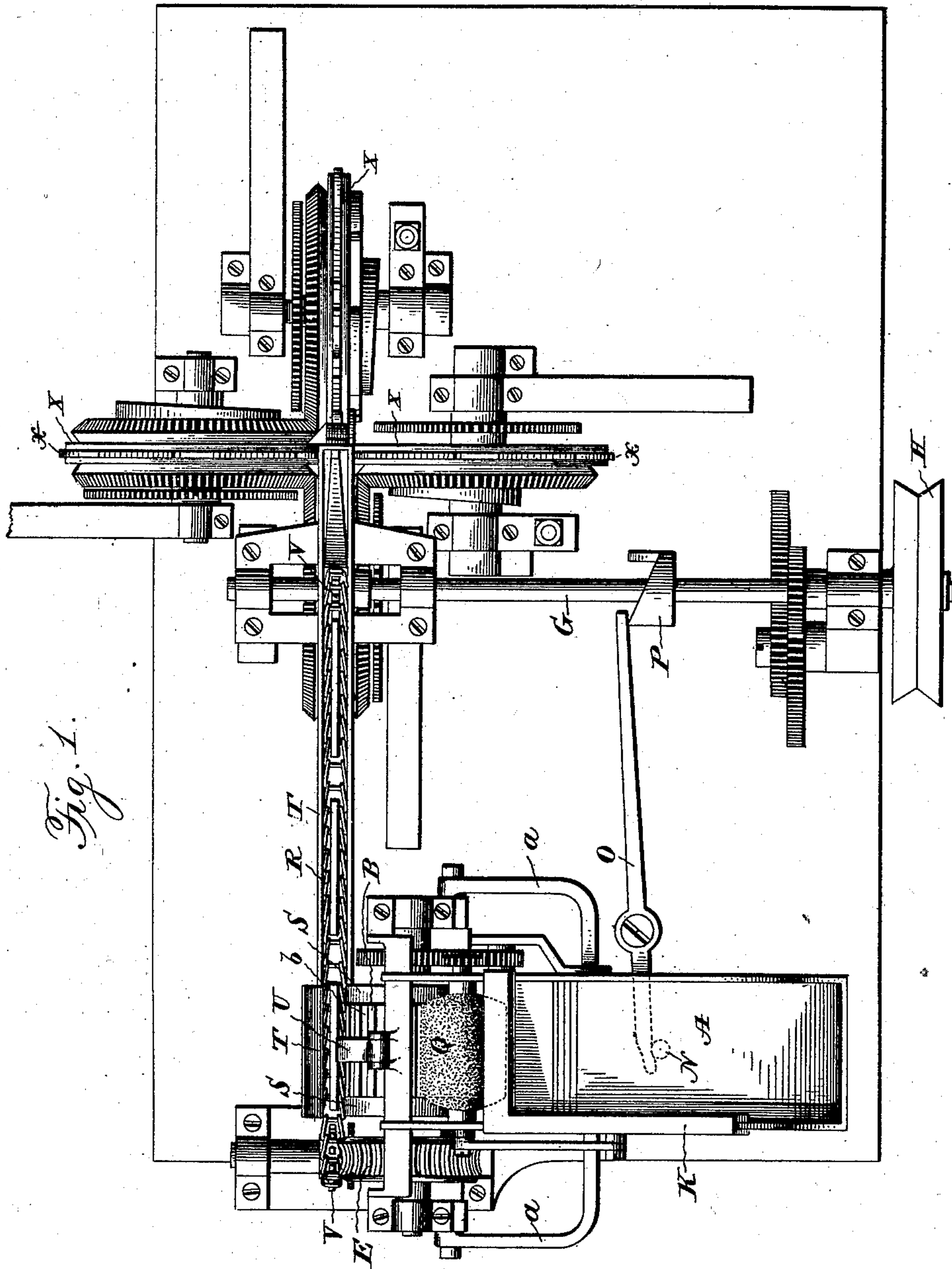


Fig. 1.

Witnesses:  
James Hutchinson  
Henry C. Hazard

Inventor.  
Mark Anthony by  
Prindle and Russell, his atty

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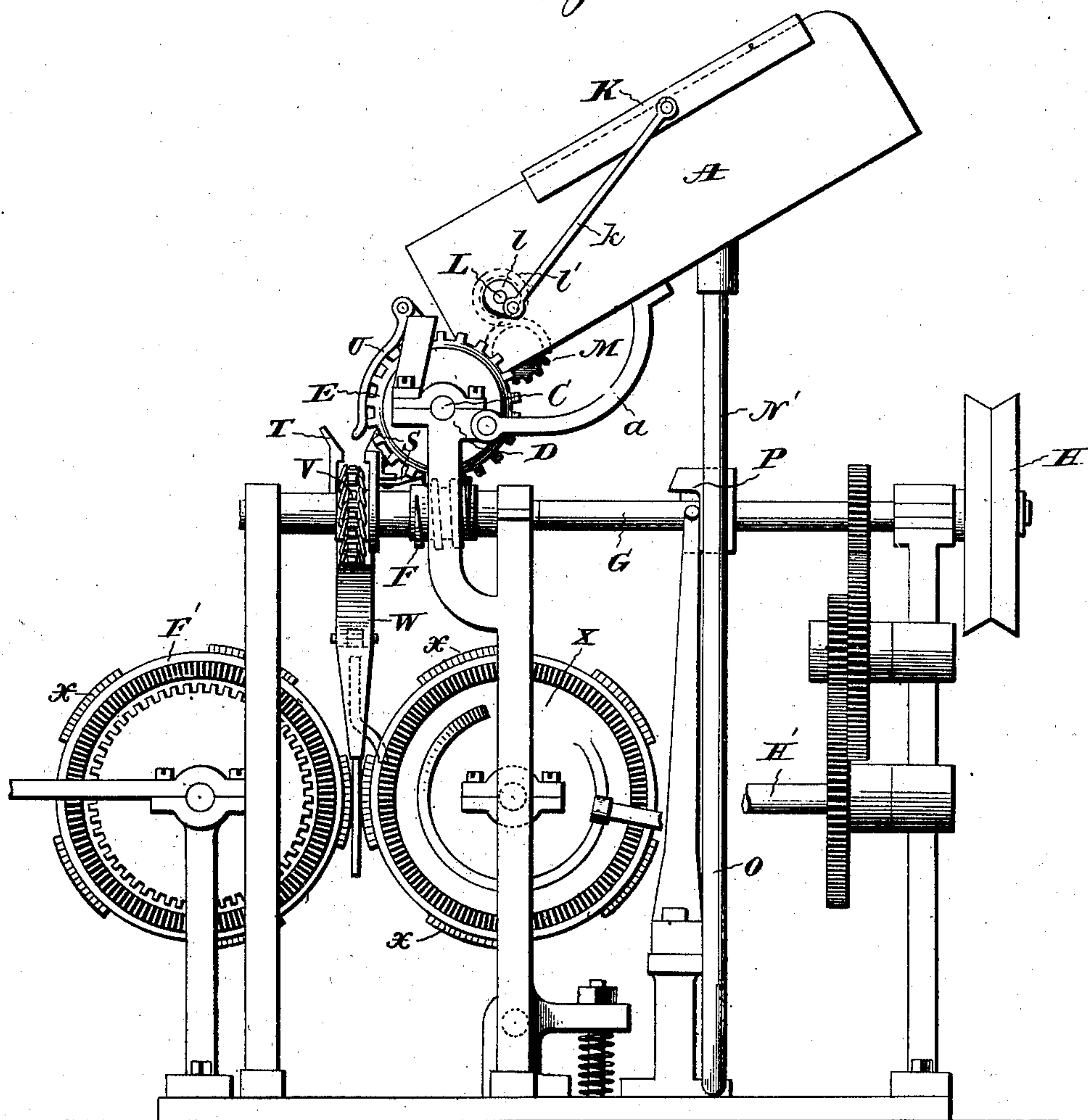
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4 Sheets—Sheet 2.

*Fig. 2.*



Witnesses:  
Jas. E. Hutchinson.  
Henry C. Hazard.

Inventor.  
Mark Anthony, by  
Prindle & Russell his attys.

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4 Sheets—Sheet 3.

Fig. 3.

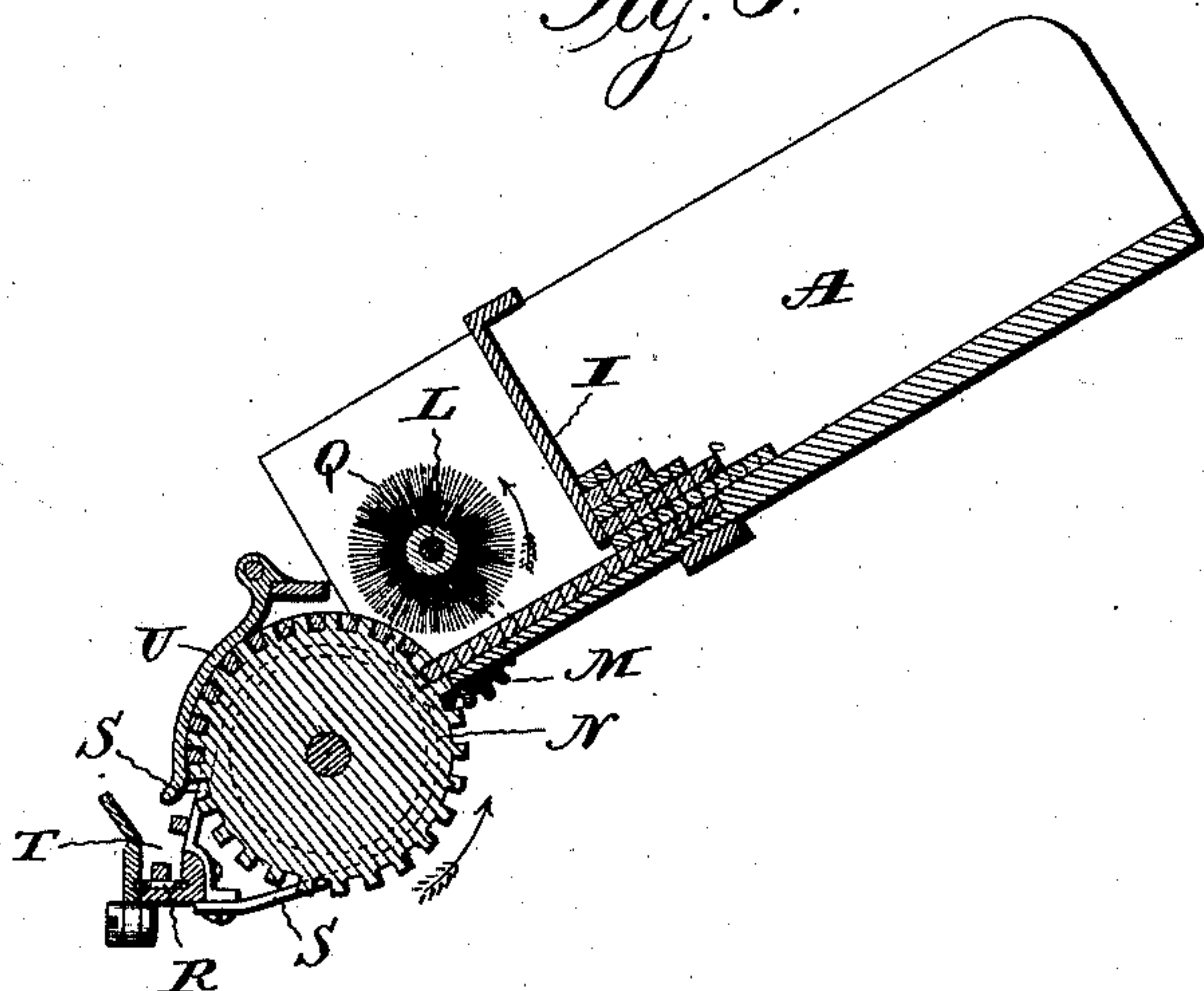
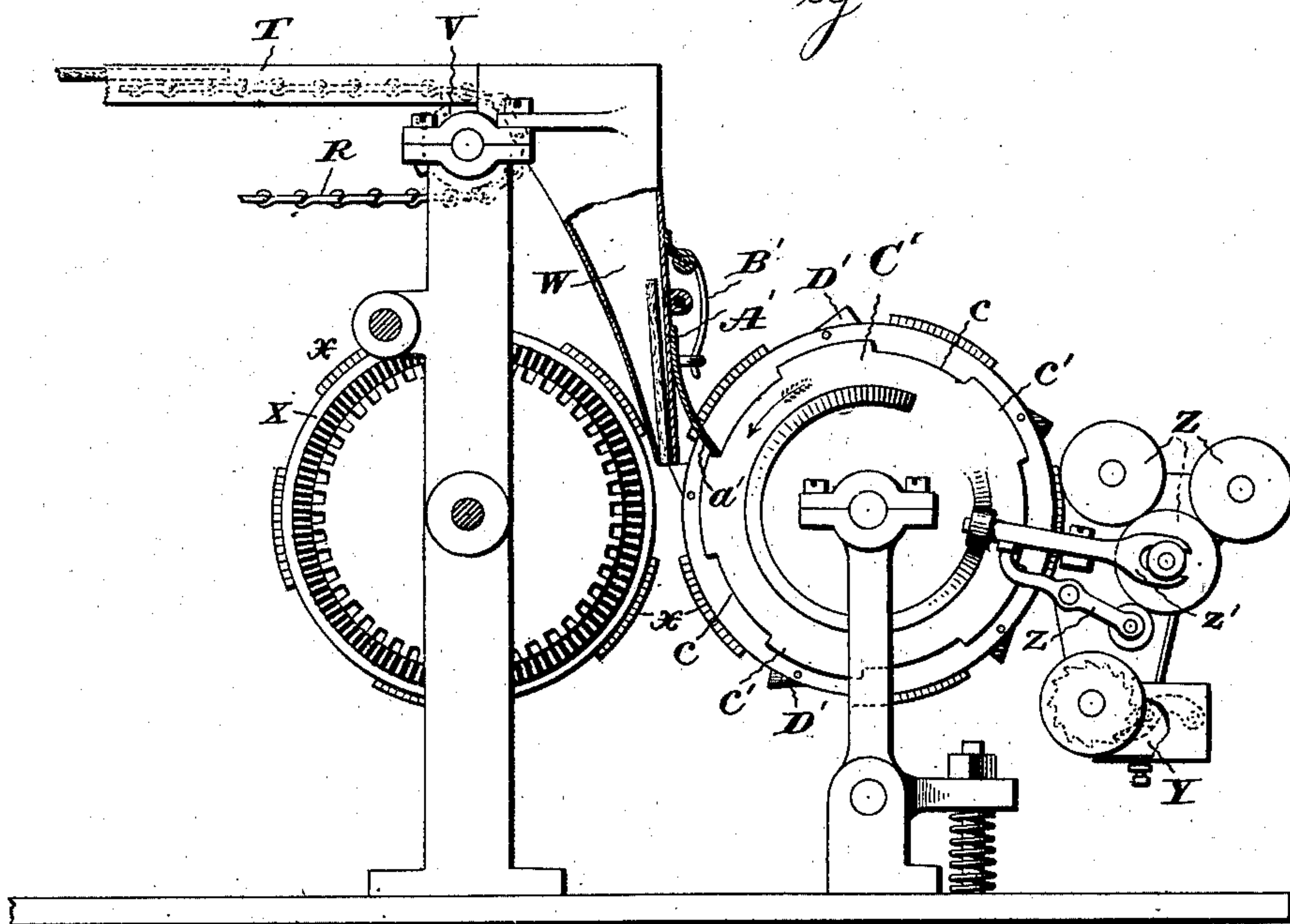


Fig. 4.



Witnesses:  
Jas E Hutchinson  
Henry C. Hazard

Inventor.  
Mark Anthony by  
Prindle & Russell, his Attys



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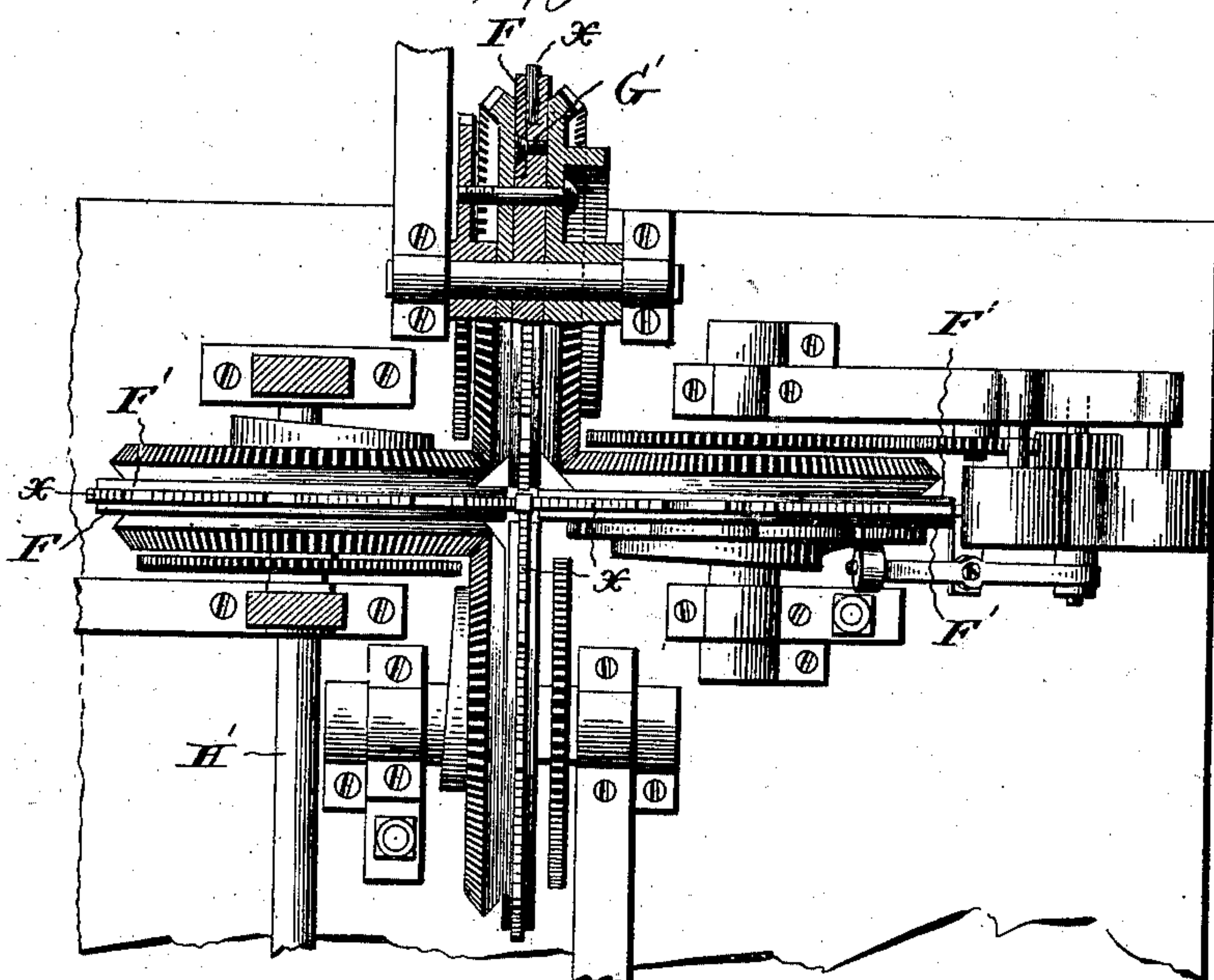
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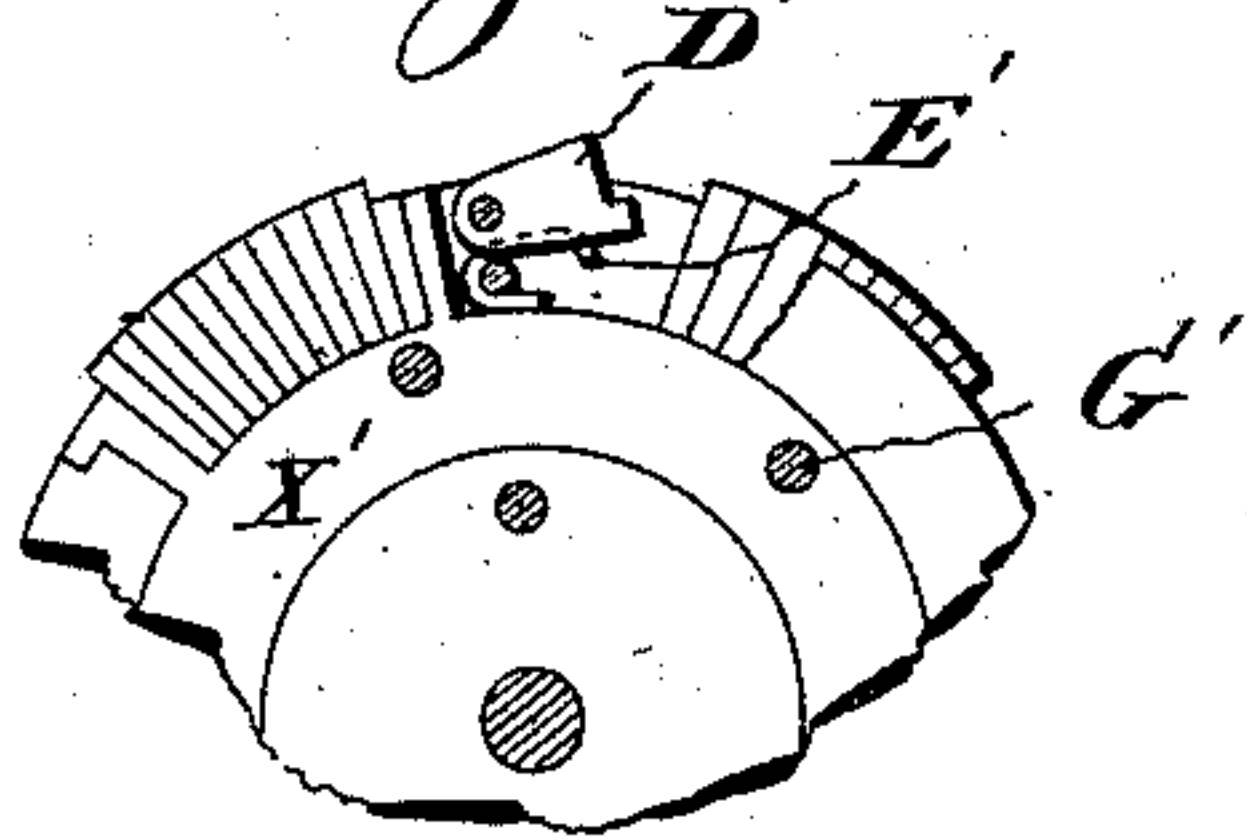
(No Model.)

4 Sheets—Sheet 4.

*Fig. 5.*



*Fig. 6.*



Witnesses:  
Jas. E. Hutchinson  
Henry C. Hazard

Inventor:  
Mark Anthony, by  
Prindle and Russell, his Attys.



# UNITED STATES PATENT OFFICE.

MARK ANTHONY, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO THE DIAMOND MATCH COMPANY, A CORPORATION OF ILLINOIS.

## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 705,631, dated July 29, 1902.

Application filed May 11, 1897. Serial No. 635,993. (No model.)

*To all whom it may concern:*

Be it known that I, MARK ANTHONY, a citizen of the United States, residing at New York city, in the county of New York, and in the State of New York, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of a printing-press embodying my invention for printing on matches; Fig. 2, a side elevation thereof; Fig. 3, a detail view, in vertical section, of the splint hopper and feeding devices; Fig. 4, a detail view, partly in section, of the printing mechanism and the devices for delivering splints thereto; Fig. 5, a top plan view, with parts in section, of the printing mechanism; and Fig. 6, a detail view of a portion of one of the printing devices.

Letters of like name and kind refer to like parts in each of the figures.

The object of this invention is to provide a printing-press adapted more especially for printing upon match-splints or other strip-form articles, and to this end said invention consists in the mechanism and its parts having the construction substantially as herein-after specified.

In the carrying of my invention into practice for printing upon match-splints I employ mechanism by which the splints are taken from a source of supply and presented one at a time to the printing devices. The source of supply is a hopper A, that has an inclined bottom and sides that are perpendicular to the bottom and separated by a space equal to or slightly greater than the length of the splints. From the hopper the splints are delivered to longitudinal grooves or pockets *b* and *b* in the periphery of a drum B, that is mounted on a shaft C, journaled in bearings in standards D and D, the periphery of the drum being sufficiently close to the lower end of the hopper-bottom that splints can pass one at a time into the respective grooves or pockets *b* and *b*. The drum is revolved by means of a worm-wheel E on the shaft C, that meshes with a worm F on a main shaft G, that has a band wheel or pulley H, whereby it may

be revolved. The mass of splints is held in the hopper by a wall or partition in the form of a plate I at the lower end thereof, which is movable back and forth to alternately prevent and permit the escape of splints to the drum, the bottom of the hopper being stepped or provided with portions in two planes, with which said plate coöperates, serving when adjacent the higher portion to prevent the passage of splints and when moved therefrom over the lower portion permitting the passage of splints, the space between the bottom of the plate and said lower portion being sufficient to permit the passage of but one splint at a time. The plate I is attached to a bar K, grooved to fit slidingly upon the upper edge of one of the hopper sides, and a pitman *k* connects said bar with a crank *l* upon a shaft L, having a pinion *l'*, meshing with a gear M, that is in turn in mesh with and receives motion from a wheel N on the drum-shaft C. The vibrations of the plate I, besides regulating the passage of splints from the hopper, serve to agitate the mass of splints in the latter and to cause them to descend therethrough to the place of exit. This agitation, however, is not sufficient; but it is desirable to supplement it by the bodily jarring of the hopper A, to permit which the hopper is, as shown, pivoted by arms *a* and *a* to the standards D and D, close to the shaft C, so that the swinging of the hopper on its pivot will not substantially change the position of its delivery end relative to the drum nor derange the gearing for reciprocating the plate I. Attached to and descending from the bottom of the hopper is a rod N, which rests against one end of a lever O, whose other end engages a cam P on the main shaft G, by means of which the hopper is alternately raised and allowed to fall with sufficient shock or jar to produce the desired effect on the splints.

Mounted between the hopper sides, outside of the plate I and on the shaft L, is a cylindrical or wheel-form brush Q, whose periphery is so close to that of the drum B that any splints not seated in the grooves *b* and *b* will as the brush revolves be swept back from the drum. It will be observed that the plate I is interposed between the mass of splints in the hopper and brush, so that the latter does not



act on the mass to the possible breakage of splints, but only on such single splints as may be displaced after passing from the mass in the hopper.

5 From the drum B the splints are delivered to an apron or carrier in the form of an endless belt or chain R, the direction of travel of the splint-carrying portion of the latter being parallel with the drum-axis, so that the splints  
10 when received by the apron lie lengthwise thereof. The splints are discharged from the drum by a plate or strip S, that is interposed in the path of the splints when carried by the drum, the latter having an annular peripheral groove deeper than the splint-pockets *b*  
15 and *b'*, from which said strip S extends tangentially outward to a point beyond the periphery of the drum, being there fastened to a suitable support.

20 The portion of the apron R that carries the splints passes through a trough-like guide or channel T, the side wall of which opposite the drum B is extended upward and outward to insure the delivery of splints falling from the  
25 drum to the apron.

Premature escape of splints from the drum is prevented and regularity of delivery of splints therefrom is secured by a curved finger U, that lies close to and concentric with  
30 the periphery of the drum, so as to confine the splints in that portion of their travel with the drum in which they might tend to fall therefrom before reaching the point designed for their discharge.

35 The apron or chain R passes over two sprocket-wheels V and V', one of which is on the main shaft G.

From the apron the splints are delivered endwise into a hopper or funnel form guide  
40 W, being directed by the latter into a vertical position and passing in such position from the guide between, preferably, several printing mechanisms, grouped so as to print on the respective sides of each splint, there being a  
45 printing mechanism for each side. The printing mechanisms are alike, each comprising a type-wheel X, carrying type *x*, arranged in groups at regular intervals apart, and an inking means, comprising a fountain Y, and a series of rolls Z and Z', by which ink is taken  
50 from the fountain and carried to the type.

No particular description of the inking mechanism is required, except to state that there is suitable gearing for revolving those  
55 rolls that require to be positively driven, that the second roll of the series is carried by a lever *z*, by the vibrations of which it is moved from the first to the third roll, and that the third roll is, as is common, reciprocated longitudinally by a lever *z'*. The movements of the levers *z* and *z'* are controlled by cams connected with the type-wheel. Each group of  
60 type prints upon but one splint, and the passage of splints from the guide W is accordingly required to be properly timed or regulated relative to the movement of the type-wheel. The outlet of the guide is opened and

closed regularly, the lower portion of one wall thereof being a pivoted piece A', which is pressed by a spring B' outward. Attached  
70 to said piece A' is a finger *a*, whose free end is in contact with the periphery of a disk C', attached to one of the type-wheels, which periphery is formed by alternating depressions *c* and elevations *c'*. When a depression *c* is  
75 opposite the free end of the finger, the piece A' is pressed and held outward by the spring B', thus leaving the outlet of the guide unobstructed, while when an elevation *c'* engages said finger the piece A' is pressed and held  
80 inward, obstructing such outlet. Carried by the type-wheel to which the disk C' is connected in the spaces between the groups of type are pivoted blocks or dogs D' and D', one for each space, a cavity being provided  
85 for each dog and for a spring E', that normally tends to press the free end of the dog beyond the peripheral face of the type-wheel. Said dogs have such location relative to the depressions *c* and elevations *c'* that as soon  
90 as a depression comes opposite the finger *a* and the guide-outlet is thereby permitted to open a dog D' will stand directly beneath the guide-outlet to receive the splint as it comes out, and thus prevent its escape before the  
95 type can engage it and insure its presentation in such relation to the type as to enable the latter to print at the desired place. The dogs are pivoted, as described, so that when they encounter the type-inking roll they will  
100 yield before it, passing into the cavity in the type-wheel.

The type-bodies are arranged radially and are wedge-shaped or tapering, and they are clamped in recesses in the side of the type-  
105 wheel by a clamping-ring X', screws being provided to secure the latter to the type-wheel. The type-wheel is placed between and held by disks F' and F', a screw or bolt G' being employed to secure the parts together. The  
110 disks are slotted to permit such circumferential adjustment of the type-wheel as may be necessary.

One of the type-wheels is mounted upon a shaft H', that is geared by a train of gears to  
115 the main shaft G, and each of the other type-wheels is on a shaft of its own, bevel-gearing being employed to derive power for each from the shaft H'. The disks F' and F' are preferably utilized to provide the bevel-gears. 120

It is to be understood that though the details of construction herein described are preferred their employment is not essential, as changes in many respects may be made in the details of the mechanism which will involve  
125 no departure from the scope of the invention.

Having thus described my invention, what I claim is—

1. The combination of printing mechanism for printing on splints and the like, a carrier  
130 that delivers splints endwise thereto, a hopper for splints and a drum adapted to support splints with their lengths parallel with the axis of the drum, said drum receiving splints



from the hopper and delivering them to said carrier, the axis of the drum being parallel with the direction of travel of the carrier, whereby splints are delivered from the drum thereto, with their lengths extending in the direction of travel of said carrier, substantially as described.

2. The combination of printing mechanism for printing on splints and the like, a feeding belt or apron that delivers splints endwise thereto, a hopper for splints, a drum having longitudinal, peripheral grooves, whose axis extends in the direction of the line of travel of the belt, substantially as and for the purpose described.

3. The combination of a splint-containing hopper, means for vibrating the same, a plate that has contact with the splints that control the outlet from the hopper, and means to vibrate said plate, independent of the hopper, substantially as and for the purpose described.

4. The combination of a hopper for splints having a bottom provided with surfaces in different planes, from the higher to the lower one of which splints move, and a piece that is reciprocable over such surfaces, that extends sufficiently close to the higher surface, to prevent the passage of splints between it and the surface, when it is over the latter, but not close enough to the lower surface, to prevent the passage of splints between the same and the piece, substantially as and for the purpose described.

5. The combination of a hopper for splints, having a bottom provided with surfaces in different planes, from the higher to the lower

one of which, splints move, and a piece that is movable to and fro from over one surface to the other, that extends sufficiently close to the higher surface to prevent the passage of splints between it and the surface, when it is over the latter, but not close enough to the lower surface, to prevent the passage of splints between the same and the piece, substantially as and for the purpose described.

6. The combination of a hopper for splints, a carrier that receives splints from the hopper, a wheel to brush back from the carrier, irregularly-placed splints, and a vibrating plate interposed between the mass of splints in the hopper and the brush-wheel substantially as and for the purpose described.

7. The combination of a hopper for splints, a carrier that receives splints from the hopper, a plate within the hopper, a slide to which said plate is attached, grooved to fit over the edge of a side of the hopper, and means to reciprocate said slide, substantially as and for the purpose described.

8. The combination of printing mechanism, including a type-wheel, a guide for the object to be printed, and a dog movably mounted on the type-wheel, so as to normally project beyond the periphery thereof, said dog being interposed in the path of the object to be printed, when it comes from said guide, substantially as described.

MARK ANTHONY.

Witnesses:

M. WILSON,  
CHAS. RATHJEN.