2 Sheets--Sheet 1.

G. H. COPPING.

Lozenge Cutting-Machines.

No. 144,258. Patented Nov. 4, 1873.

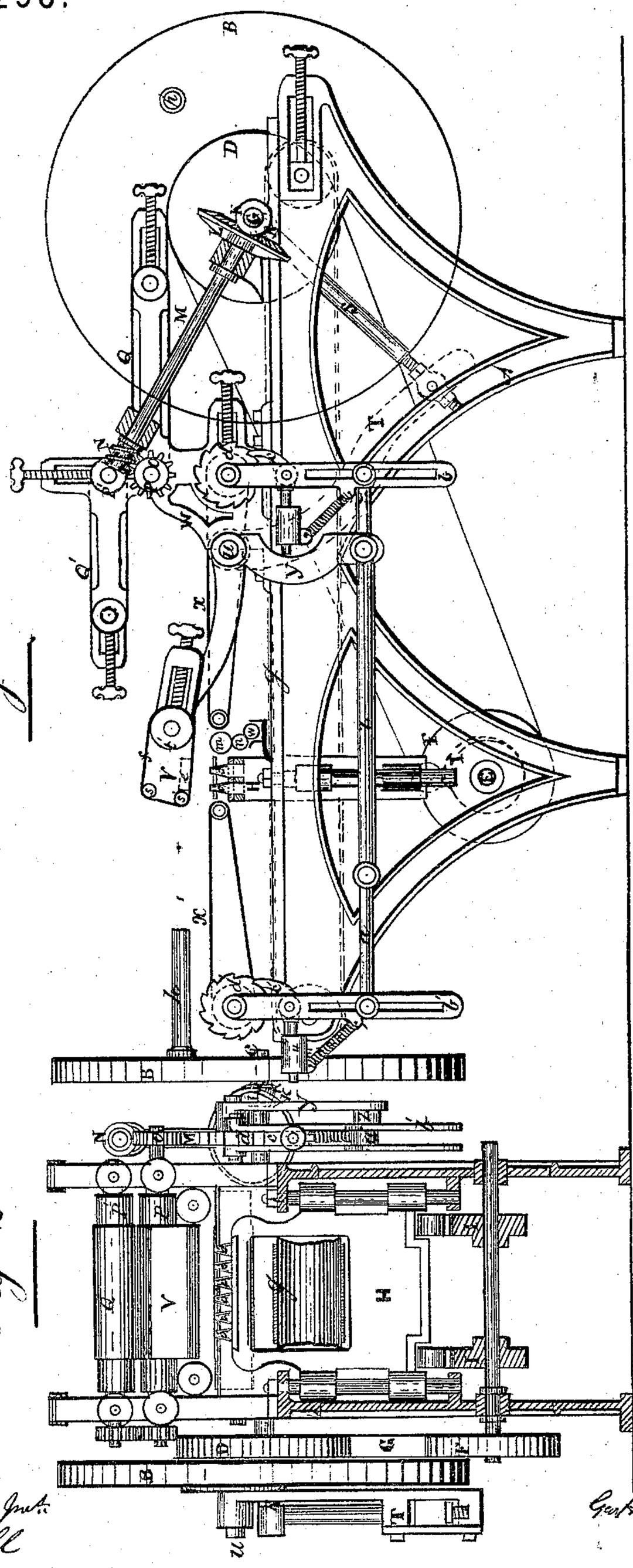

Fig 1

Fig 2

Witnesses;
James Martin Jnr.
William Gill

Inventor;
Gotthreana Copping

2 Sheets--Sheet 2.

G. H. COPPING.

Lozenge Cutting-Machines.

No. 144,258.

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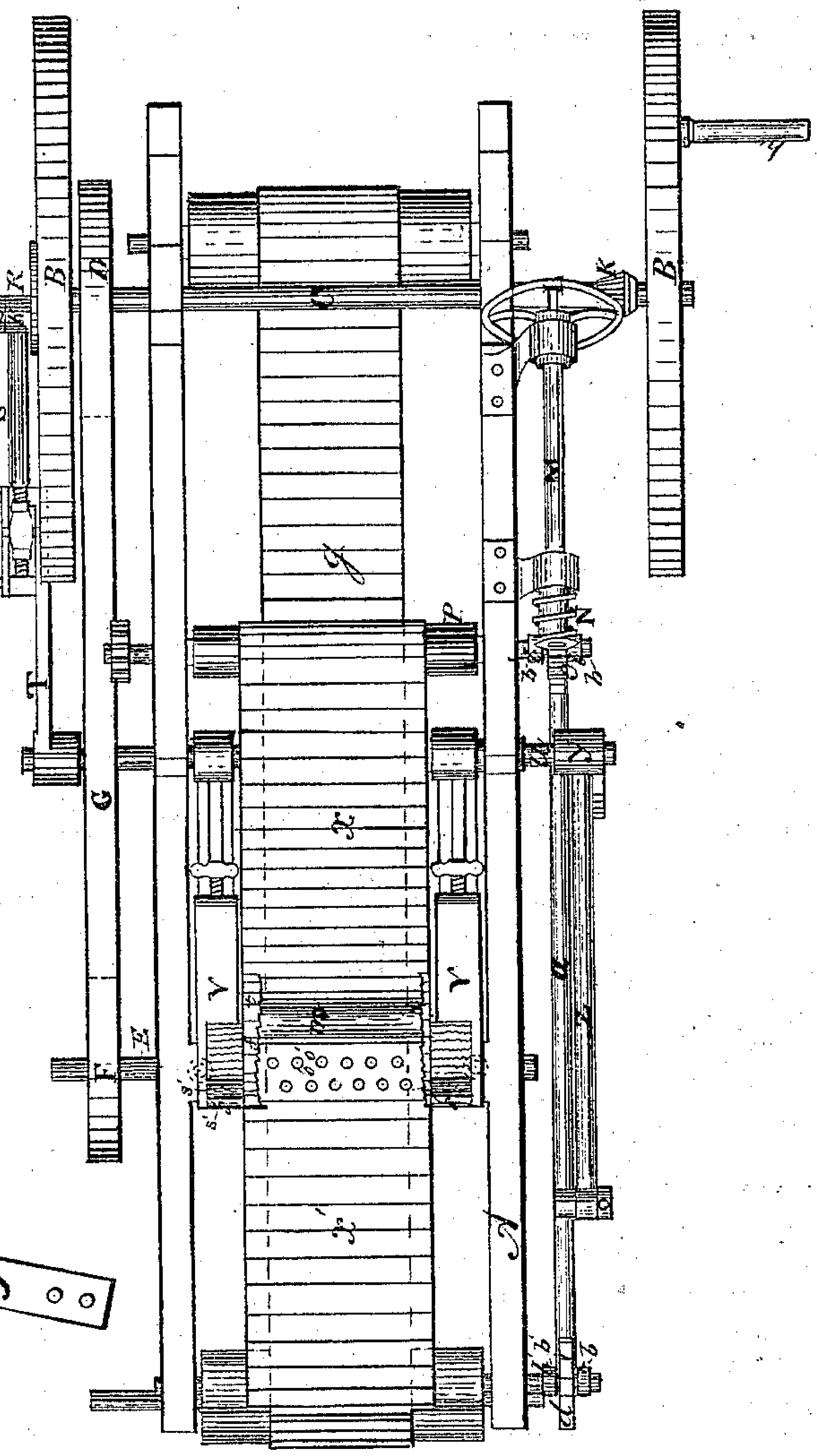

Fig. 3.

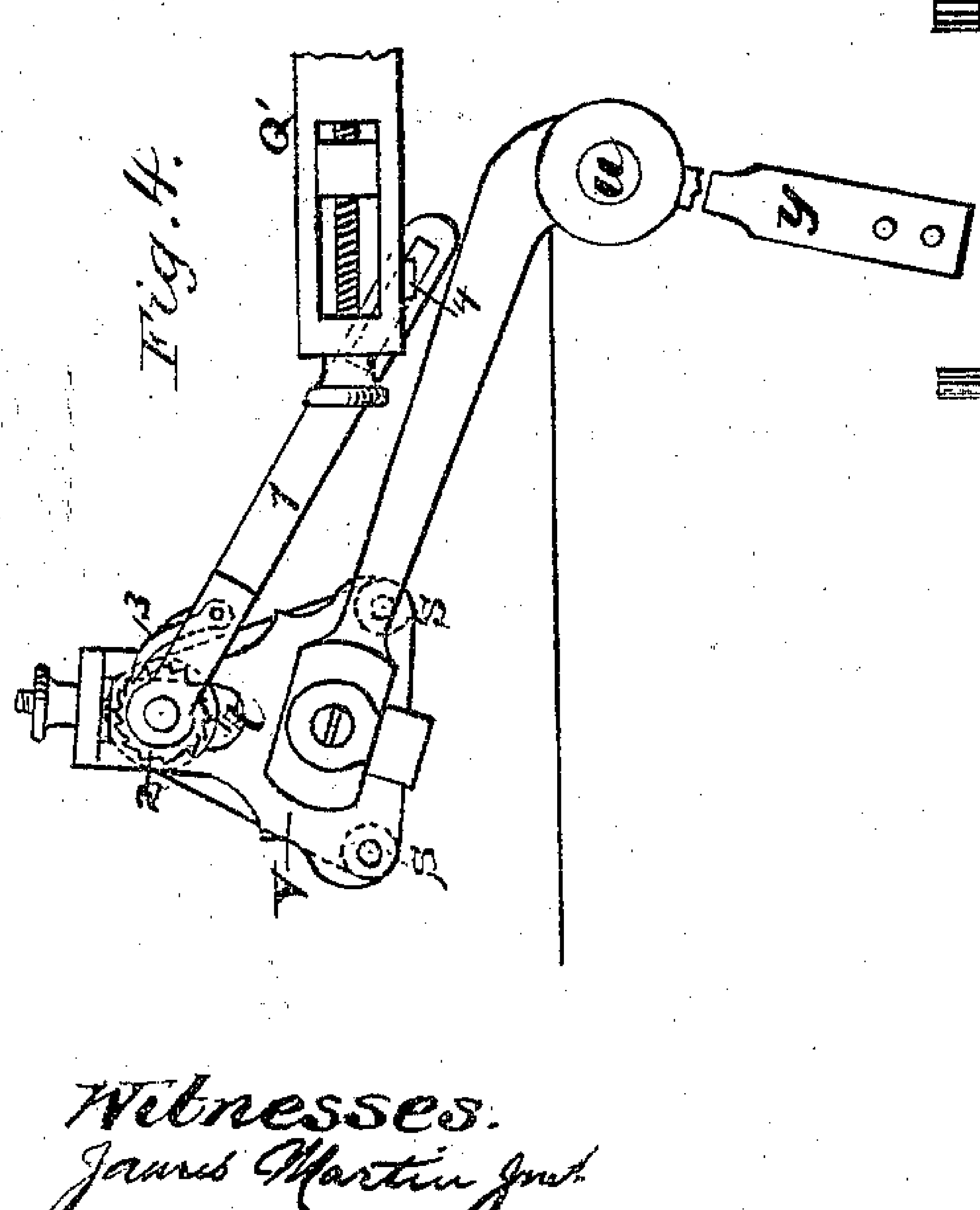

Fig. 4.

Witnesses.

James Martin Jnr.

William Gill

Inventor.

Geo Hiram Copping

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

GEORGE H. COPPING, OF TORONTO, CANADA.

IMPROVEMENT IN LOZENGE-CUTTING MACHINES.

Specification forming part of Letters Patent No. **144,258**, dated November 4, 1873; application filed March 22, 1873.

To all whom it may concern:

Be it known that I, GEORGE HIRAM COPPING, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Lozenge-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to a series of improvements in the mechanism in the principal parts of lozenge-machines, whereby a general simplification is obtained in the construction of said machines. It consists, first, in combining vertically-moving printing apparatus with vertically-moving cutters, both operated together, and beneath the sheet of dough; second, in the special devices for giving motion to the rolling apparatus; third, in a vibrating head, upon which the cutters act, combined with the means whereby its apron is fed; fourth, in the special means for giving to the head its vibratory motion; fifth, in combining with the vibrating head a system of printing devices beneath the sheet of dough, such devices having a vertical intermittent motion.

In the following specification the same letters of reference indicate the same parts, and also on the drawings.

Figure 1 is a front view of the machine, in which all of the said improvements can be seen and explained. Fig. 2 is an end view, which shows the construction of the frame H and other parts of the machine. Fig. 3 is a plan of the machine. Fig. 4 is a detailed view of a head, V, and its connections.

A is the frame; B B, the large wheels, in one of which is a handle, *h*, for turning the same; C, the first-motion shaft. On this shaft there is fastened a bevel-wheel, K, which turns the bevel-wheel L on diagonal shaft M, and on the upper end of this diagonal shaft is a worm, N, which turns a wheel, O, on the end of the roller P, with apron Q, thereby giving motion to the same. This arrangement of mechanism is used for communicating motion from the first-motion shaft to the rolling apparatus P P′ and Q Q′. On the first-motion shaft C is also a pulley, D, which turns another pulley, F, on the shaft E, by means of the belt G. On this shaft E are two cams, I I, which give a vertical and intermittent motion to the frame H, with cutters *o′ o′*. This arrangement of mechanism is used for communicating motion from the first-motion shaft to the cutting apparatus H *o′ o′*. On the first-motion shaft C is also a stud or crank, R, which, by means of the rod S and arm T, (to which rod S is adjustably connected,) communicates a rocking motion to the rock-shaft U. On this rock-shaft U is fastened the frame or arms which support the head V, which thus receives an up-and-down or vibratory motion from the rock-shaft U. This arrangement of mechanism is used for communicating from the first-motion shaft a rocking motion to the shaft U, and the consequent vibratory motion to the head V. If desired, the head V may be made stationary. On the rock-shaft U is an arm, Y, which gives motion to the arms *b b* by means of the link Z and connecting-rod *a*. The arms *b b′*, by means of the pawls *c c′* and ratchets *d d′*, give an intermittent motion to the aprons *x x′*. This arrangement of mechanism is used to communicate motion from the rocking shaft *u* to the aprons leading to and from the cutting apparatus.

The parts *b b′*, *c c′*, and *d d′*, I do not claim as of my invention, such parts having been used before.

There is placed near the cutters *o′ o′*, and affixed thereto, the printing apparatus, consisting of the three rollers *w n m*, which receive a rotary motion from the apron *x*, and a vertical intermittent motion from the frame H, for printing the lozenges while in the sheet. The lower one of these rollers revolves in a trough which contains the printing material, and from which it is conveyed by the other rollers to the dough; and the entire system of trough and rollers receives the vertical intermittent motion, so that the printing or type roller does not, in its rise and fall, become separated from its companion rollers, nor any of them become separated from the supply-trough, their relative position not being disturbed by the up-and-down motion; hence the apparatus continuously and automatically feeds the ink to the printing-roller.

The dough from which the lozenges are made in this machine is placed on the apron Q, passes through the rollers P P′, and descends over the curved plate *w* to apron *x*.

In passing to the cutters the printing is performed, and when cut the lozenges drop on the apron *g*, and by it are conveyed to a suitable receptacle.

In the construction of a hand machine, the apron *x'* and mechanism comprising rod *a*, arm *b'*, pawl *c'*, and ratchet *d'*, are dispensed with.

The head V, besides being hung upon vibrating arms, is so hung upon centers that, if desired, it may turn or be turned so as to present adjustably its surface to the action of the cutters, thus adapting itself to proper positions. Its apron is caused to be fed intermittently, at the proper periods, by means of a slotted arm, 1, riding upon a fixed pin, 4, the latter, as the head V vibrates, checking the play of the slotted arm, and thus forcing a pawl, 3, to actuate the ratchet-wheel 2 on the apron-roller.

The devices which give to the head V its vibratory movements are simple, and the head and its supports are very compactly located and arranged in respect to the feeding, and printing, and cutting apparatus. In the travel of the sheet of dough, the vibratory action of the head being in a somewhat backward direction from the sheet as the latter moves forward, the head in rising is more quickly and effectually cleared from the dough than if its vibration were in a forward direction, or than can be the case where it moves vertically.

By uniting together the cutting and printing devices, they not only act in perfect harmony as to time and character of movement, but there is great economy, inasmuch as the same device actuates both; whereas, when separated, and especially when one acts upon one side of the sheet of dough and the other on the opposite side, it is necessary that each shall have its own special mechanism to actuate it.

By using a cam having an abrupt place therein, as shown, to permit the cutters to drop instantly away from the sheet far enough to avoid all possibility of their lagging in the way of the same as it continues its progressive feeding motion, I effect a material improvement over the use of an eccentric or irregular groove for moving the cutters; and by causing the cutter rods or supports to drop by gravity, or to be forced down by springs the instant the cam has passed them, less friction is caused, and less wear, and less power is required to drive the machine.

My machine is also materially simplified by employing but two belts and their four rollers to receive and compress the sheet of dough and deliver it to the carrying-belt, which takes it to the printers and cutters, and in doing this there is no point at which the sheet hangs by its own weight, or incurs any liability of being strained or torn apart.

I claim—

1. The combination of vertically-moving printing devices with vertically-moving cutters, both being positively and simultaneously lifted by the same lifting mechanism, to print as well as to cut from the under side of the sheet of dough.

2. The mechanism comprising the bevel-wheels K L, diagonal shaft M, worm N, and worm-wheel O, for communicating motion to the apparatus P P' Q Q' from the first-motion shaft C, as described.

3. The vibrating head V, constructed substantially as described, in combination with the slotted arm 1, fixed stop or pin 4, and the pawl and ratchet-wheel for feeding the apron *f*.

4. The described mechanism for giving to the head V its vibratory movement, consisting of the stud R, rod S, arm T, and shaft U, as arranged and described.

5. The combination, with the vibrating head V, operating above the sheet of dough, of the system of printing trough and rollers beneath the sheet, such system having a positive vertical intermittent motion in addition to the rotary motion of the rollers, the whole substantially as specified and described, and for the purposes set forth.

Toronto, 17th March, 1873.

GEORGE HIRAM COPPING.

Witnesses:

JAMES MARTIN, Jr.,

WILLIAM GILL.