3 Sheets—Sheet 1.

E. ALLEN.

SPOOL-PRINTING MACHINE.

No. 188,223. Patented March 13, 1877.

Fig. 1.

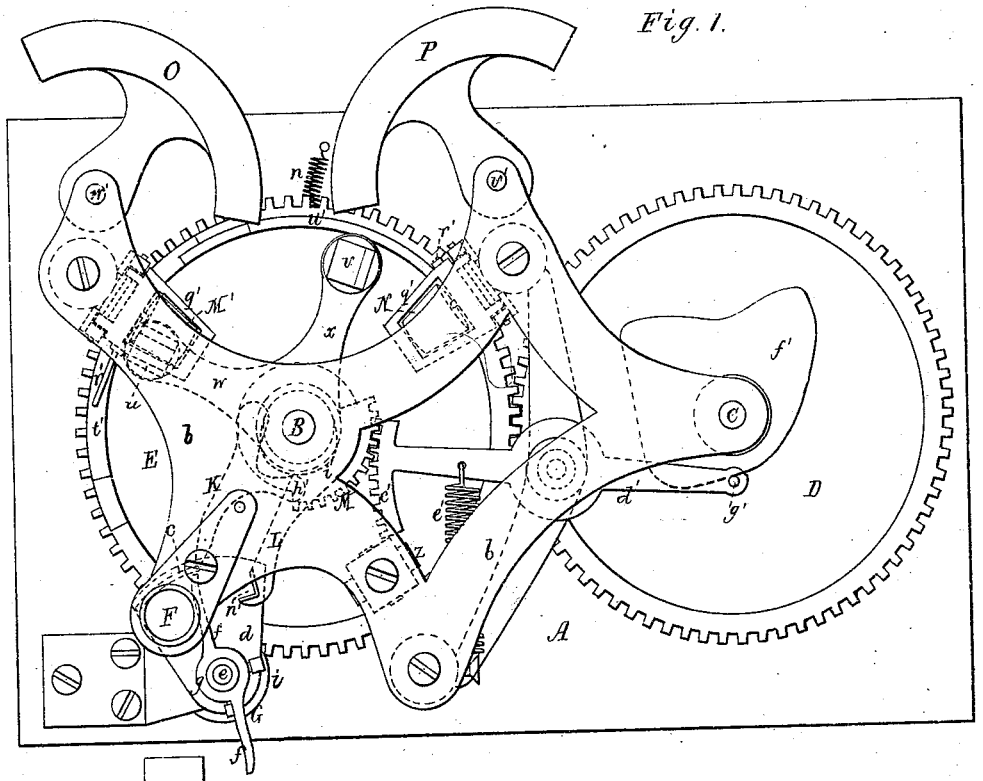
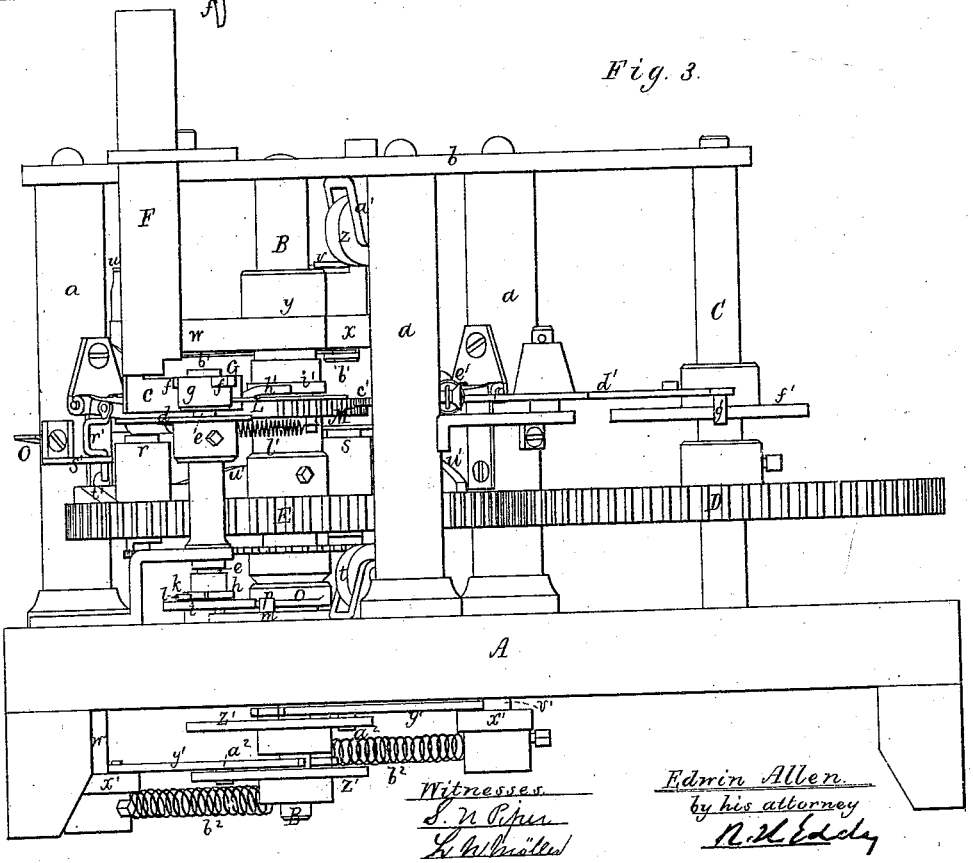


Fig. 3.



Witnesses.
S. N. Piper
L. W. Briesler

Edwin Allen.
by his attorney
R. H. Eddy

3 Sheets—Sheet 2.

E. ALLEN.

SPOOL-PRINTING MACHINE.

No. 188,223. Patented March 13, 1877.

Fig. 2.

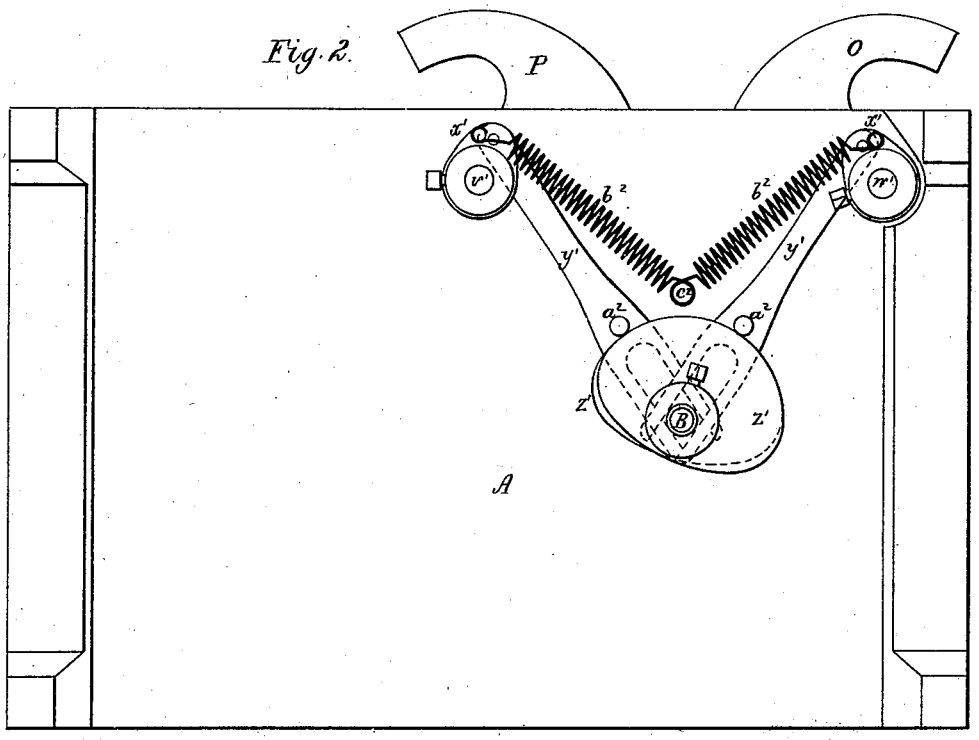
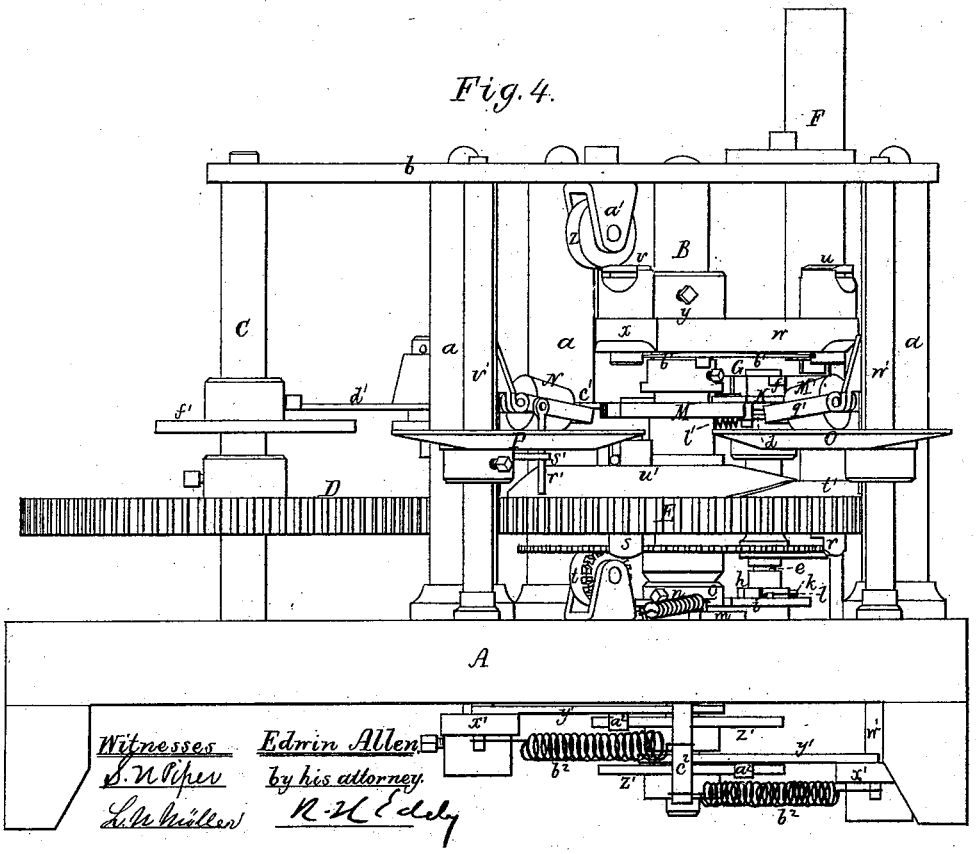


Fig. 4.



Witnesses
S. N. Piper
L. M. Hollen

Edwin Allen
by his attorney.
R. H. Eddy

3 Sheets—Sheet 3.

E. ALLEN.

SPOOL-PRINTING MACHINE.

No. 188,223. Patented March 13, 1877.

Fig. 6.

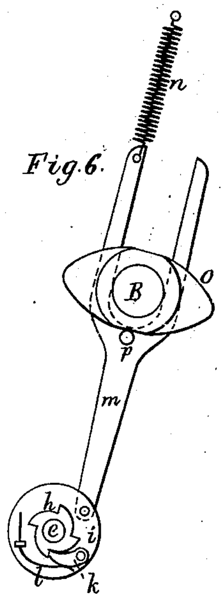


Fig. 8.

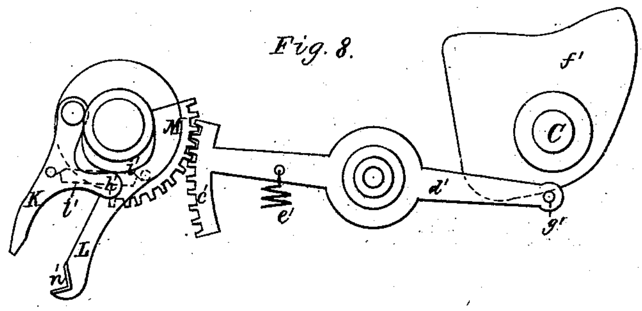
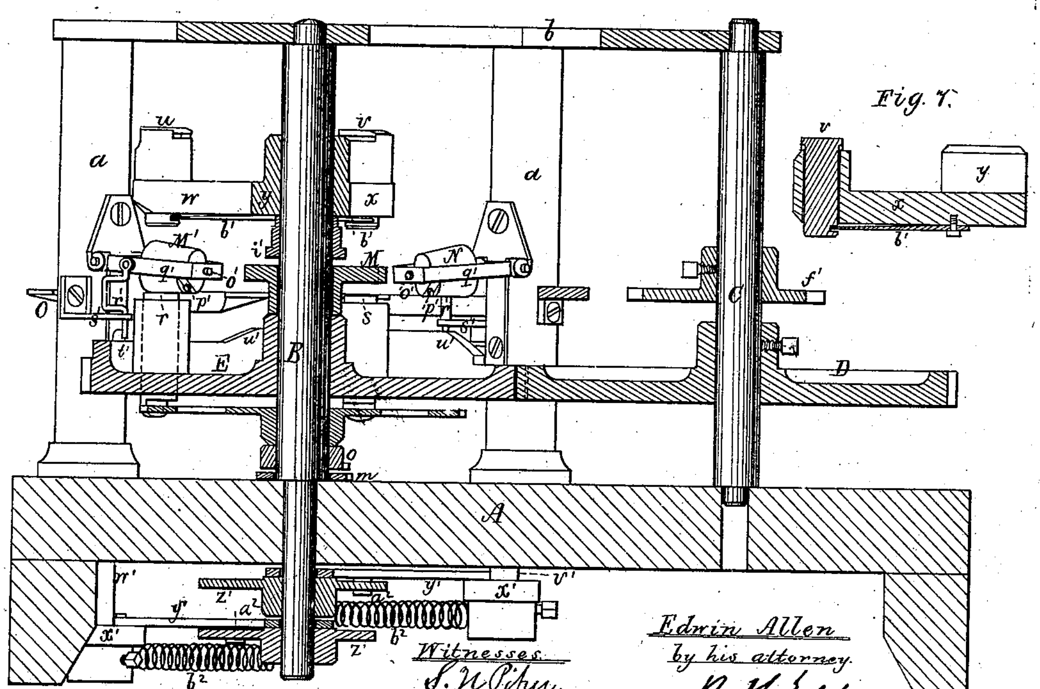


Fig. 5.

Fig. 7.



Witnesses.
S. N. Piper.
L. W. Miller.

Edwin Allen
by his attorney.
R. H. Eddy

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWIN ALLEN, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN SPOOL-PRINTING MACHINES.

Specification forming part of Letters Patent No. **188,223**, dated March 13, 1877; application filed July 12, 1876.

To all whom it may concern:

Be it known that I, EDWIN ALLEN, of Norwich, of the county of New London, of the State of Connecticut, have invented certain new and useful Improvements in Machinery for Printing Spools; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 denotes a top view, Fig. 2 an under-side view, Fig. 3 a front elevation, Fig. 4 a rear elevation, and Fig. 5 a vertical and longitudinal section, of a machine embodying my invention; such other figures as may be necessary for further illustration of it being hereinafter referred to and explained.

My invention consists in or relates, first, to the combination of a stationary platform and spool-receiver with continuous rotary sets of printing-dies, a pair of oscillatory nippers, and an intermittent rotary transferrer provided with mechanism substantially as, and for operating them essentially as, hereinafter explained; second, to coloring-rollers and reciprocating rotary coloring-sectors, arranged and provided with mechanism as, and for operating them as, hereinafter described, in combination with a stationary platform and spool-receiver, and with continuous rotary sets of printing-dies, oscillatory nippers, and an intermittent rotary transferrer, provided with mechanism substantially as, and for operating them as, hereinafter set forth.

In the said drawings, A denotes a table or base, having erected upon it three posts, *a*, connected at their upper ends to a cap, *b*. Between and having their bearings in the said base and cap are two vertical shafts, B C, one of which—viz., that marked B—extends down through, and projects a short distance below, the base. On the said shafts are fixed two horizontal spur-gears, D E, which engage with one another. One of them (viz., D) is to be driven by the pinion of a suitable motor. A vertical tube, F, fixed to, and projecting down from and above, the cap *b*, and provided at its lower end with a curved guide, *c*, as shown, receives the spools to be printed, they being laid one over the other in the said tube, with the lower one resting directly on a stationary platform, *d*, arranged below the lower end of the tube a distance a little greater than the length of a spool to be printed. Over the said platform is the intermittent rotary transferrer G, which consists of a vertical shaft, *e*, and two arms, *f f*, the latter being extended from a hub, *g*, fixed to the shaft. In order to transfer the spools successively from the tube F to and between the oscillatory nippers K L the transferrer G has machinery for imparting to it an intermittent rotary motion. Such machinery may be described as follows, it being shown in top view in Fig. 6: A ratchet-wheel, *h*, is fixed on the shaft *e*, and has below it, and to turn freely on the said shaft, a disk, *i*, provided with a pawl, *k*, to engage with the wheel, such pawl being kept against the periphery of the ratchet-wheel by a spring, *l*. The disk *i* is pivoted to a furcated slide, *m*, down between whose prongs the shaft B extends. A helical spring, *n*, fixed to the rear part of said slide and to the base A, serves to retract the slide. An elliptical cam, *o*, fixed to the shaft B, and arranged with a stud, *p*, extending up from the slide, answers to move the slide forward. By the movements of the slide a reciprocating rotary motion will be imparted to the disk, whereby the pawl *k* and the ratchet-wheel *h* will be caused to impart to the transferrer an intermittent rotary motion. The gear E supports and carries two vertically-movable dies or printers, *r s*, so applied to such wheel as to be capable of sliding up and down therein. They extend through the wheel, and are successively forced upward by being carried against and over the periphery of a wheel, *t*, arranged as represented. Above and immediately over the said dies or printers is another set of dies or printers, *u v*, movable vertically within, and supported by, two arms, *w x*, extending from a hub, *y*, fixed on the shaft B. The dies *u v* are successively depressed by being carried against and underneath a wheel, *z*, sustained in a supporter, a^1, fixed to the cap. Each of the dies *u v* is provided with a spring, b^1, for raising it in its socket, such spring being shown in Fig. 7, which is a vertical section of the die and its supporting-arm.

When the die *u* or *v* is carried against the wheel *z* such die will be depressed a little toward the spool, and it will be held stationary

while an impression is being taken. The spool will be printed by the lower die being moved upward, so as to force the spool up to the upper die. After the impression has been given and the upper die may have passed by the roller, the spring of the die will elevate it, so as to enable the spool to be moved back without being smutched.

To operate with the printing-dies, the spool receiver and transferrer is a pair of nippers, K L, that project from a sectoral gear, M, which is movable on the shaft B.

Fig. 8 is a top view of the mechanism for operating the nippers. The gear M engages with a toothed segment, c^1, fixed to one end of a lever, d', which, arranged as shown, is provided with a retractive spring, e'. A cam, f', fixed on the shaft C, acts against a stud, g', extended from the lever. The nipper K is pivoted to the gear M, and has a projection, h', to bear against a cam, i', fastened on the shaft B. A spring, l', fixed to the nipper K and to the hub of the gear M, serves to draw the said nipper toward its fellow L, which is provided with an angular mouth or socket, n', to receive a spool and allow it to move vertically, as occasion may require. While the cam f' is revolving, the nipper K will be moved away from the nipper L, a spool will be moved by the transferrer from the receiver across the platform and into the socket n', the nipper K will close upon the spool and hold it to the nipper L, and by both it will be moved directly between one set of the printers, and moving along with them, it will be printed in one color by them on its opposite ends, while they may pass between the wheels t z. The nippers next move backward and carry the spool between the next approaching pair of dies, and move with them between the wheels t v, during which movements the spool will be again printed on its ends with another color. After this has been accomplished the nippers are moved back, and one of them is moved away from the other, so as to discharge the spool or enable it to fall from between them.

The next part of the machine relates to the mechanism for applying the colors to the dies. M′ and N are two inking or coloring rollers, each being the frustum of a cone, and fitted to slide lengthwise on an arbor or short shaft, o', to which it is fixed by a set-screw, p'. These rollers and their shafts are arranged within two frames, q' q', that are hinged to two of the posts a. Each of such frames has a pitman, r', pivoted to it, and extended down through a guide, s'. The two pitmen r' r' rest on the upper surface of the gear E, which is provided with two cams, t' u', which, by their action against the pitmen while the gear is in revolution, elevate such and the roller-frames q' q', in order to cause the coloring-rollers to be moved and held upward, so that they may apply color to the upper printing-dies during their revolution. When the frames q' q' are at their lower position the color-rollers are in situations to apply color to the lower dies. It should be observed, however, that one roller is to have upon it a color different from that of the other, and that each roller applies its color to one of the upper dies, and to the lower die which is below the other upper die. The coloring-rollers receive their color from two reciprocating rotary sectors, O P, formed and arranged as represented, and fixed to vertical shafts v' w', having upon their lower ends cranks x' x'. To these cranks furcated pitmen y' y' are pivoted. They straddle the shaft B, upon which is fixed two cams, z' z', to act against studs a^2 a^2, projecting from the said pitmen. Helical springs b^2 b^2 connect the cranks x' x' with a stud, c^2, extended from the base, all being arranged as represented.

During each revolution of the gear E the inking or coloring sectors will be moved inward and outward, and the rollers will be moved downward, the whole being so as to cause the sectors to apply colors to the rollers, the coloring-inks being duly spread upon the upper surfaces of the sectors.

By having the coloring-rollers conical and movable on their shafts, and provided with set-screws for fixing them to the shafts, as described, each roller, as it may become worn down, can be moved forward and adjusted to take a proper bearing upon the inking-sector while in contact with or receiving color therefrom.

In the above-described machine, I claim as my invention as follows:

1. The combination of the stationary platform d and spool-receiver F with the continuous rotary sets of printing-dies u r v s, the oscillatory nippers K L, and the intermittent rotary transferrer G, provided with mechanism for operating them, substantially as specified.

2. The coloring-rollers M′ N and their reciprocating rotary sectors O P, arranged and provided with mechanism for operating them, as described, in combination with the stationary platform d and spool-receiver F, and with the continuous rotary sets of printing-dies u r v s, the oscillatory nippers K L, and the intermittent rotary transferrer G, provided with mechanism for operating them, essentially as set forth.

3. The combination of the conical coloring-rollers M N with the two sets of printing-dies r s u v and the reciprocating rotary sectors O P, all being arranged and to operate substantially as set forth.

EDWIN ALLEN.

Witnesses:
R. H. EDDY,
J. R. SNOW.