3 Sheets--Sheet 1.

T. H. SPEAR.

Machine for Making Toy Torpedoes.

No. 165,960. Patented July 27, 1875.

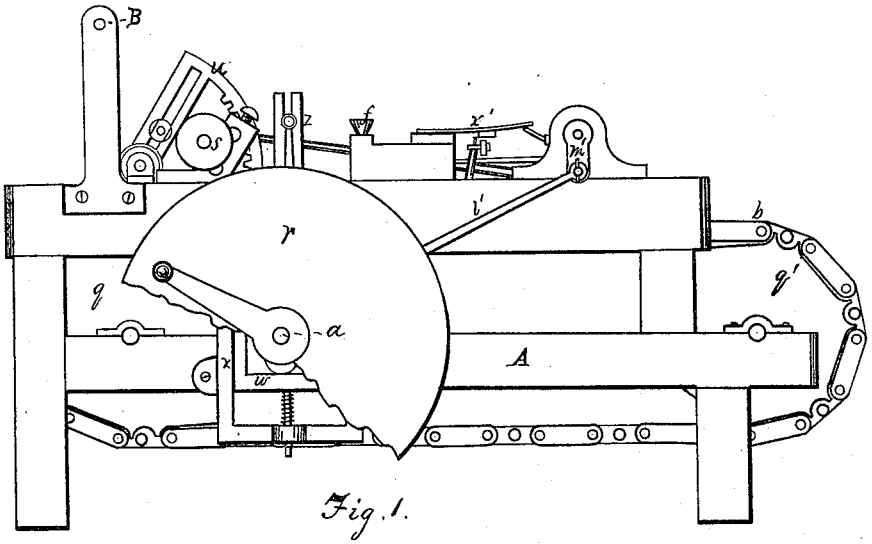

Fig. 1.

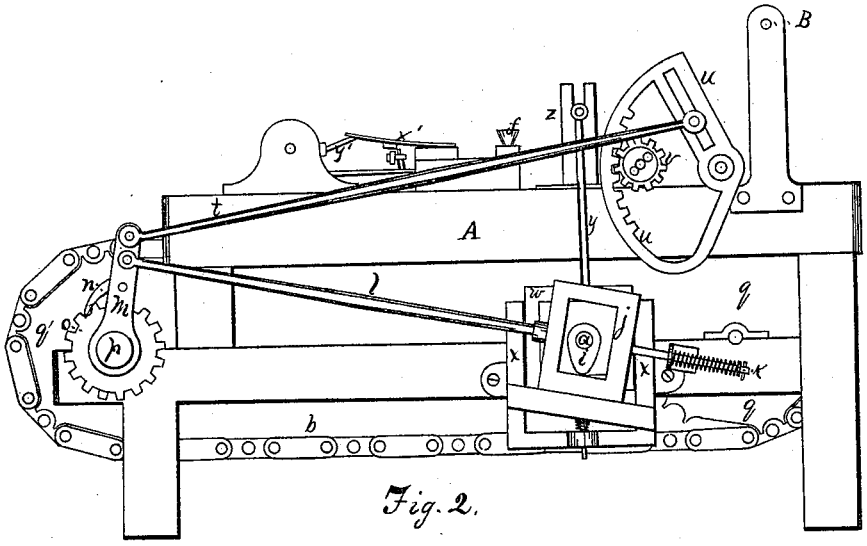

Fig. 2.

Witnesses:
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Frank H. Jordan

Inventor:
Thaddeus H. Spear
per attys
Wm. Henry Clifford

3 Sheets--Sheet 2.

T. H. SPEAR.

Machine for Making Toy Torpedoes.

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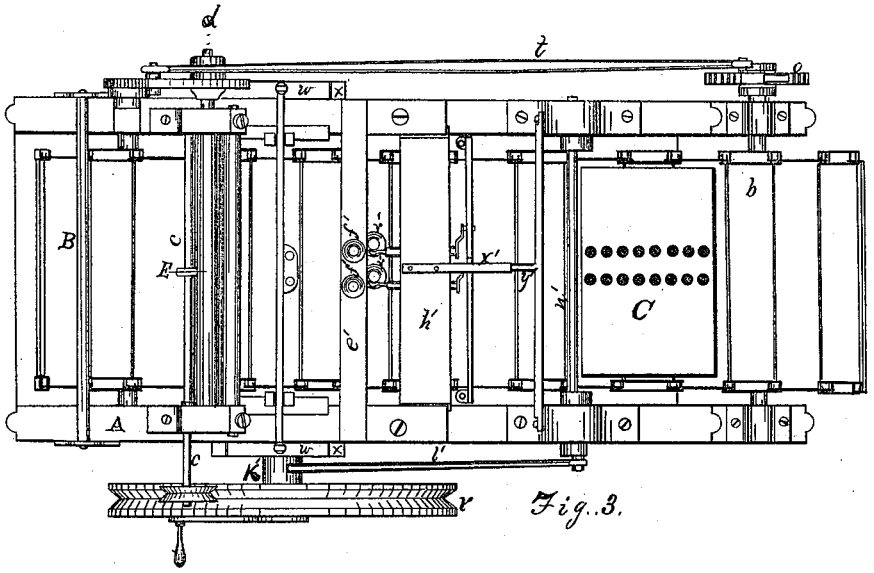

Fig. 3.

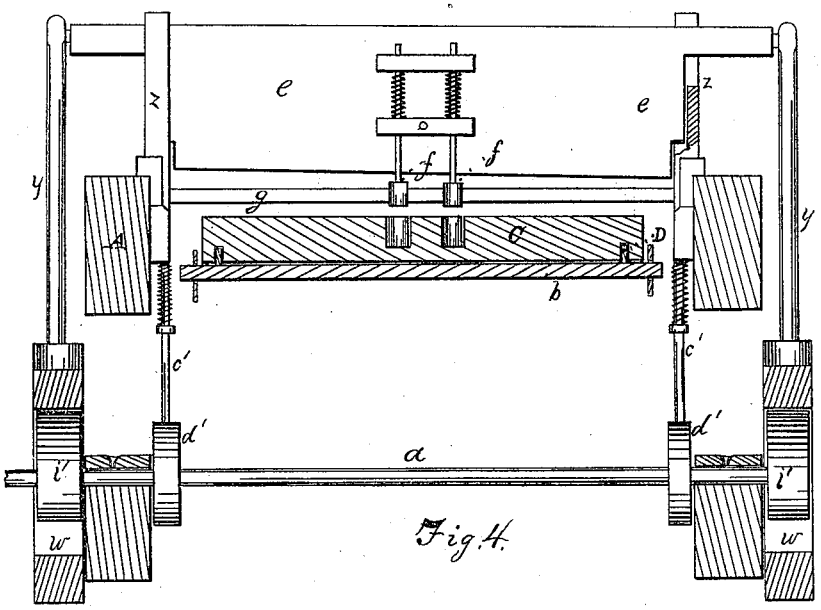

Fig. 4.

Witnesses:

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3 Sheets--Sheet 3.

T. H. SPEAR.

Machine for Making Toy Torpedoes.

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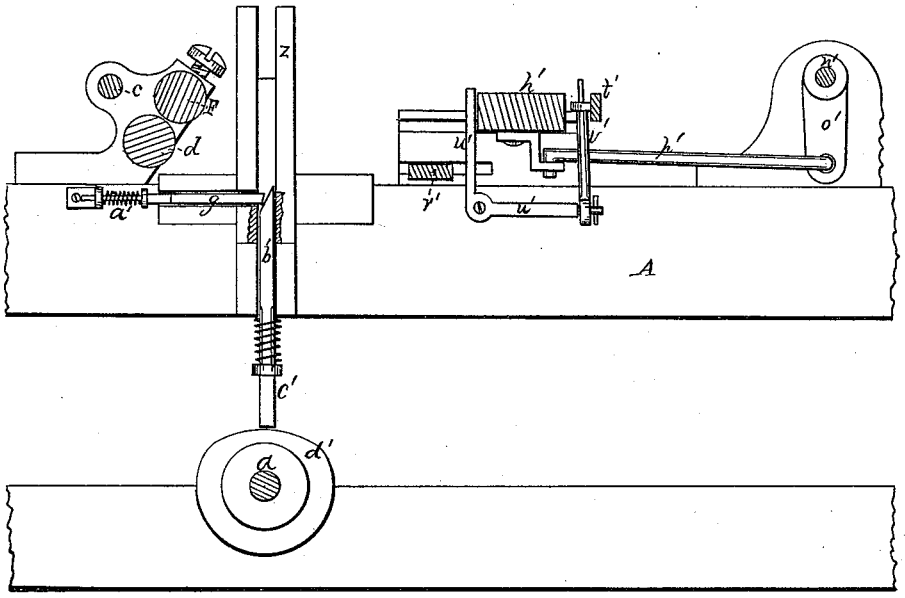

Fig. 5.

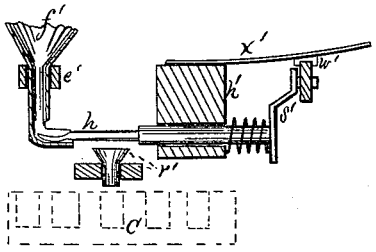

Fig. 6.

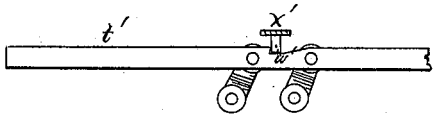

Fig. 7.

Witnesses:
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Frank H. Jordan

Inventor:
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per atty.
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UNITED STATES PATENT OFFICE.

THADDEUS H. SPEAR, OF GARDINER, MAINE.

IMPROVEMENT IN MACHINES FOR MAKING TOY TORPEDOES.

Specification forming part of Letters Patent No. **165,960**, dated July 27, 1875; application filed December 31, 1874.

To all whom it may concern:

Be it known that I, THADDEUS H. SPEAR, of Gardiner, in the county of Kennebec and State of Maine, have invented certain new and useful Improvements in the Manufacture of Toy Torpedoes; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

Same letters show like parts.

My invention has relation to a machine for the manufacture of what are called toy torpedoes.

It will be remembered that these are made of a little sack of paper twisted together at the top end, and containing a little fulminating-powder placed under a few grains of coarse gravel. This is in order that when the toy is thrown upon the ground, the contact of the gravel with the fulminate will cause the explosion desired.

A description of the different parts of the machine will first be made.

a is the main and driving shaft of the machine. From this is produced, directly or indirectly, the following motions of the following parts: first, the intermittent motion of the endless belt *b;* second, the motion of the cutter-roll *c;* third, the rotation of the feed-roll *d;* fourth, the vertical motion of the cutter *e* and the rammers *f;* fifth, the horizontal movement of the plate *g;* sixth, the compound motion of the spoons *h*, by which the fulminating-powder is emptied into the papers.

The motion of the endless belt *b* is produced by the combination of the shaft *a*, frame *j*, cam *i*, spring and rod *k*, rod *l*, lever *m*, gear and pawl *o n*, shaft *p*, and notched wheels *q*. By the movement of the main shaft *a*, the cam *i* causes the frame *j* to be moved forward, and its motion is communicated to the lever *m* by means of the rod *l*, and thus the lever, by means of its pawl *n*, moves the gear *o*. This gear is rigid on the shaft *p*, as are also the notched wheels *q*. Therefore as the notched wheels *q* are caused to rotate, they move in the same degree the endless belt *b*, which has projections or other convenient devices to fit the notches of said wheels *q*, and so be moved with them as they rotate. At the rear end of the machine are also two other similar notched wheels, *q'*. These four wheels keep the belt *b* in proper shape and properly distended, as will be seen from the drawings. On the opposite end of the shaft *a* from the frame *j* is the large wheel *r*. From this a band extends to the pulley *s*. By this means the cutter-shaft is rotated.

The feed-roll *d* is operated as follows: Pivoted to the lever *m* is the rod *t*, which is also adjustably attached to a bell-crank lever, *u*, which has a gear within the same, as illustrated in the drawing, and which matches with the gear *v* on the feed-roll *d*. Thus, as the lever *m* is moved in the manner before described, the feed-roll is caused to revolve in one direction. When the bell-crank lever *u* is rocked backwardly by the rod *t*, the gear *v* is so set and applied to the feed-roll that said gear will revolve backwardly upon the feed-roll without imparting to it such backward motion. This is effected either by spring-pins which fit behind shoulders on the sides of the gear *v* when it rotates in a forward direction, and slide up inclined surfaces when it moves in the opposite direction, or it may be effected by an ordinary pawl and ratchet.

The vertical motion of the cutter *e* is effected in the following manner, as well as the rammers *f*, which are carried with it: Upon the ends of the shaft *a* are placed two frames, *w*, which work in guides *x*. These are caused to rise and fall by the cams *i i'*, and as they so rise and fall, they lift and press the vertical cutter *e* by means of the connecting-rods *y*. The ends of the cutter *e* are set in vertical guides *z*, in order to insure its correct motion.

It will be seen that the rammers *f* are attached to the front face of this cutter, and are raised and depressed with it.

The plate *g* is so arranged as to have a slight horizontal movement away from the cutter *e* as soon as it has descended and performed its office. This movement of the horizontal plate is for the purpose of preventing the vertical cutter from bearing or drawing against the edge of said plate during its upward movement.

Should the horizontal plate not move away from the cutter, it would turn the edge of the

said cutter during its upward movement like the edge of a currier's knife, thereby unfitting it for cutting the ribbons of paper.

This plate *g* is provided with two short rods on its rear edge, which work into steps or guides, and are surrounded with small spiral springs. They may be seen at *a'*. These springs keep the plate *g* pressed forward as far as it is allowed to go; but when the cutter *e* is about to rise, two small wedge-shaped bars, *b'*, rise at the same time and press the horizontal plate *g* backward a little by bringing their inclined edges in contact with the forward edge of the plate at each of its ends. These two wedge-pieces *b'* are caused to rise and push the plate back by the rods *c'*. These rods are pushed up by being in contact with the eccentrics *d'* on the main shaft *a*. The rods are drawn down by spiral springs, which surround them.

Upon the fixed bar *e'* are placed any desired number of hoppers, *f'*, to contain the fulminating-powder. These hoppers have cups at their lower ends, which are open at one side. Into these cups enter the spoons *h*, in order to receive the requisite amount of the powder, and empty it into the papers, in the manner to be hereinafter described. The spoons *h* are fixed in the sliding bar *h'*, and are operated as follows:

Connected with the eccentric *k'* on the main shaft *a* is the rod *l'*, connected with the crank *m'* on the shaft *n'*. This shaft has two cranks, *o'*, carrying rods *p'*, which are attached to the sliding bar *h'*, and by means of which the bar is caused to move backward and forward. When the bar is thus moved forward the spoons enter the hoppers *f'* and receive their charge of the powder. When the bar is drawn backward in the manner described, and the spoons are over the small conductors *r'*, they are turned over so as to empty their contents into the said conductors. This is effected as follows: Their ends are rigidly connected with the cranks *s'*. These cranks are pivoted to the bar *t'*. Around the stocks of these spoons are set spiral springs, so arranged as to turn them in such manner that they will discharge their contents into the conductors, as before described. When the bar *h'* is moved toward the hoppers, it strikes the bent levers *u'*, pivoted at their angles to the frame of the machine. To these are pivoted the two vertical rods *v'*, and when the arms of the bent levers are raised by their vertical parts being pushed back by the sliding bar *h'*, the bar *t'* is raised by the rods *v'* until a notch in it receives the catch *w'* on the spring-bar *x'*. As the bar *h'* is then drawn away from the hoppers, a stud, *y'*, striking the spring-bar *x'*, lifts it out, together with its catch *w'*, of the notch in the bar *t'*, and so the spirals around the stocks of the spoons turn the same, depress the bar *t'*, and discharge the contents of the spoons, as before described.

A is the frame of the machine, of convenient form. B is a roll, upon which the paper to be employed is wound. C are beds, with rows of perforations, as illustrated. These are made of such size as to fit between four of the studs D on the belt *b*, and so be carried along with it as it is moved.

The paper to be cut is slitted by cutters like the one E on the cutter-roll *c*. By these the paper is cut into ribbons. After being thus cut the paper passes between the feed-roll *d* and the idler F. From thence it is fed upon the plate *g*. Passing between the forward edge of this plate and the edge of the vertical cutter *e*, the ribbons are cut into short pieces, which fall upon the beds C and over the depressions made therein. These pieces of paper are then pressed into the depressions in the beds C by the rammers *f*, thus forming pockets for the reception of the powder from the spoons *h*, and through the conductors before described, placed under the spoons. The beds C are carried forward to a position under the spoons by the intermittent motion of the belt *b*, before described.

A set of devices of the same construction as those employed to deposit the powder in the papers is also employed to deposit the gravel in the papers and upon the powder. The beds C are then carried forward to the front end of the machine, where they are lifted from the belt *b*, the projecting ends of the papers twisted together, and the torpedo is complete.

A blower, operated either by the rotation of the main shaft of the machine, or in any convenient manner, and having a tube to connect it with a perforated cylinder extending along the back edge of the horizontal plate *g*, will, by creating a blast of air, keep the ribbons of paper sufficiently tight, and will direct them between the edges of the horizontal plate and the vertical cutter.

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

1. In a machine for making toy torpedoes, the combination of the shaft *a*, cam *i*, frame *j*, rod *l*, lever *m*, belt *b*, with its notched wheels, substantially as and for the purposes described.

2. The combination of the shaft *a*, cam *i*, frame *j*, rod *l*, lever *m*, rod *t*, gear *u*, gear *v*, and the feed-roll *d*, as and for the purposes described.

3. The combination of the horizontal plate *g* and the vertical cutter, operating substantially as described.

4. The combination of the spoons *h* with the hoppers, for the purpose of supplying the papers with the powder and gravel, substantially as herein described, the same operating as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

THADDEUS H. SPEAR.

Witnesses:

E. EVERETT ROBBINS,

JOSEPH EDGECOMBE.