

(No Model.)

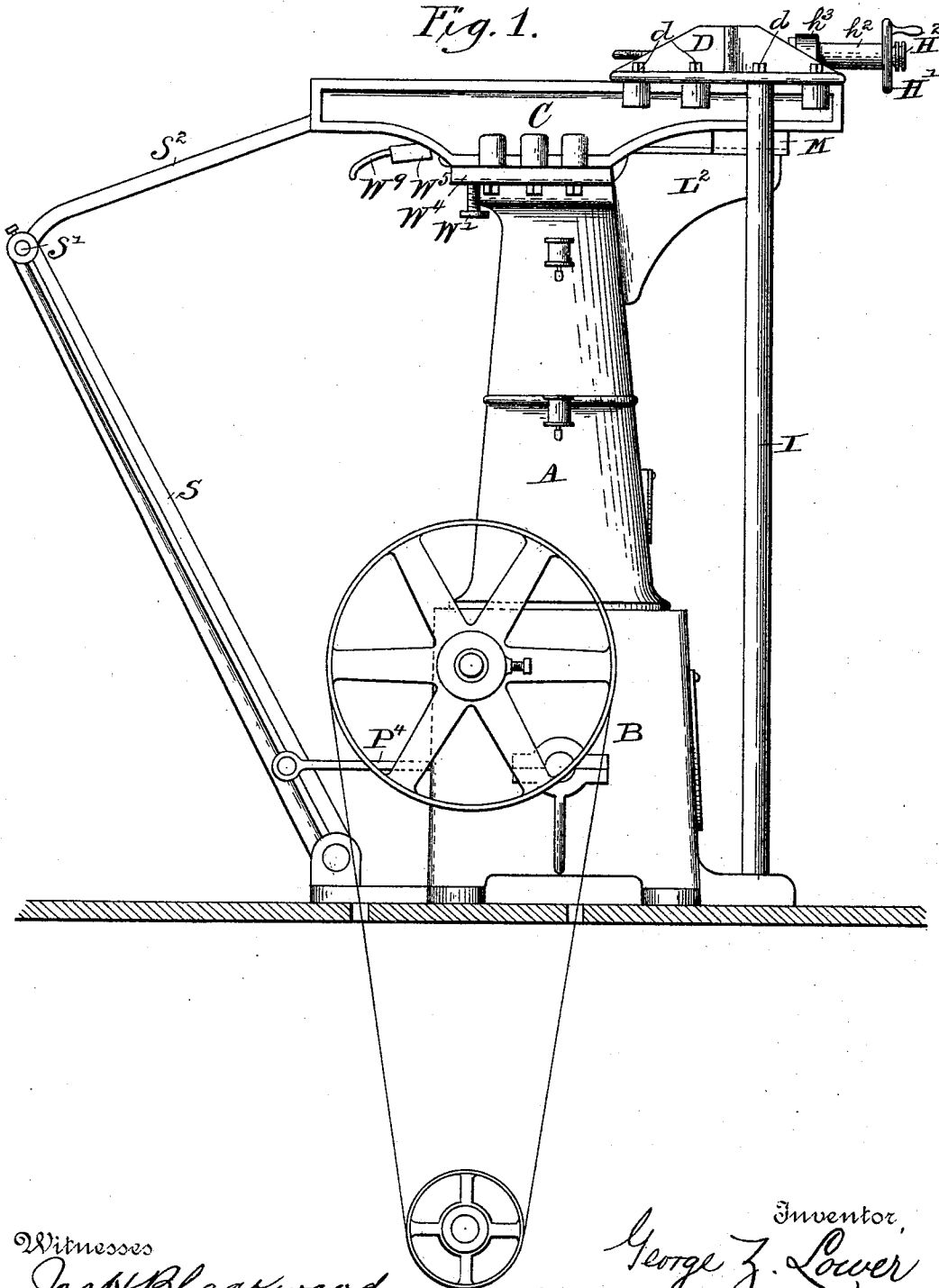
5 Sheets—Sheet 1.

G. Z. LOWER.
BOX PRINTING MACHINE.

No. 495,420.

Patented Apr. 11, 1893.

Fig. 1.



Witnesses

John Blackwood
R. F. Heck

By his Attorney

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W. A. Doolittle

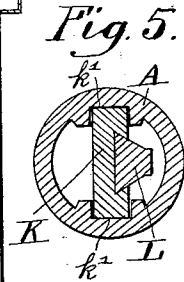
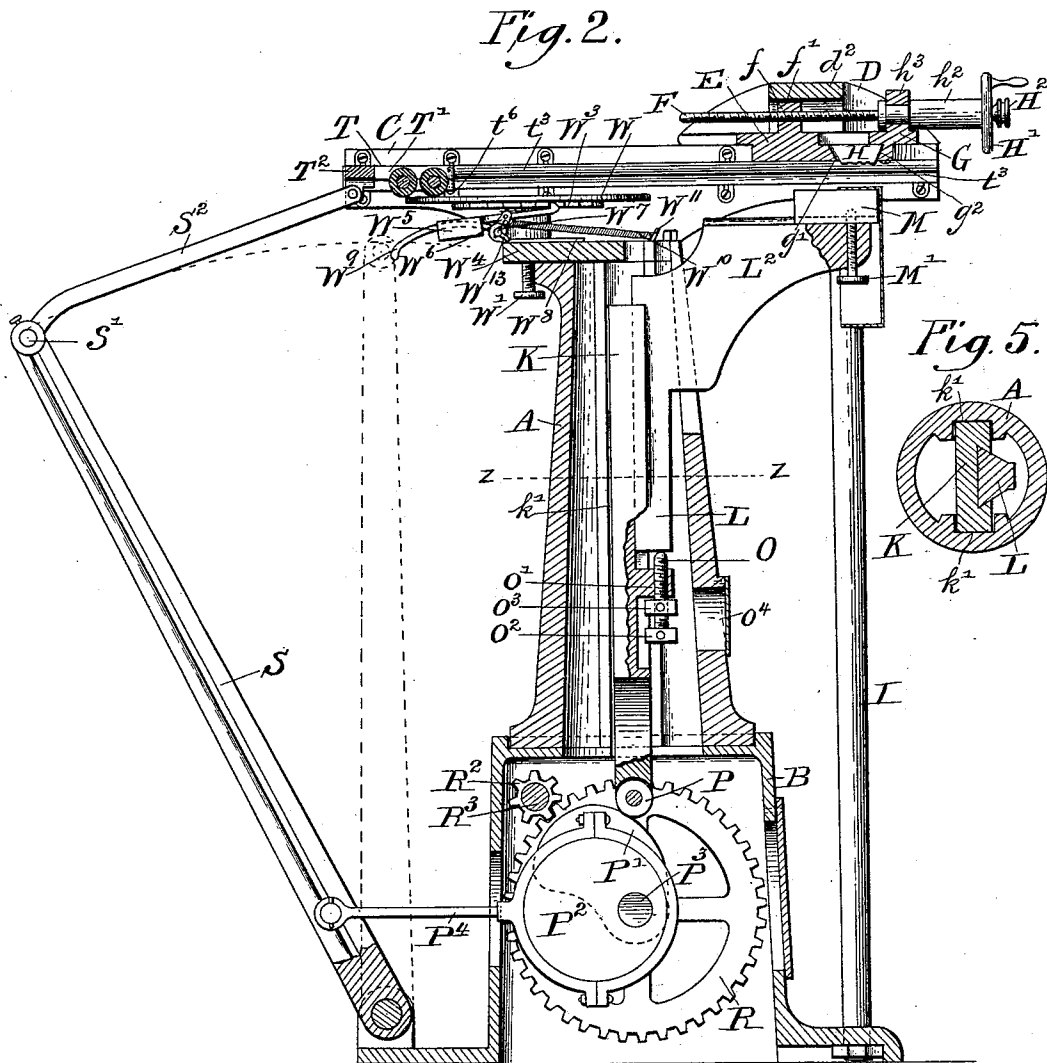
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Witnesses

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Fig. 3.

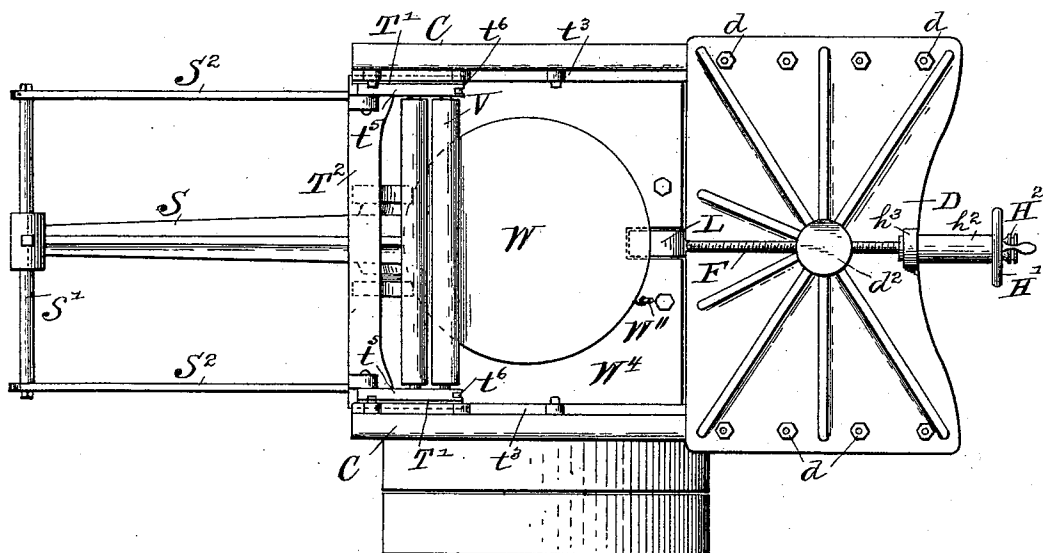


Fig. 14.

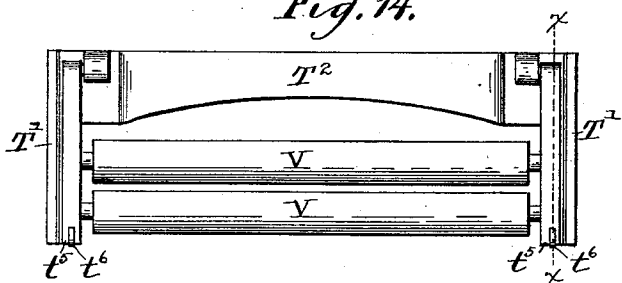


Fig. 16.

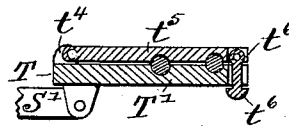


Fig. 15.

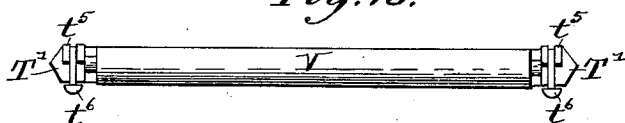
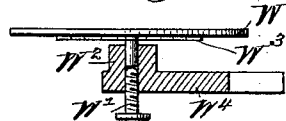


Fig. 13.



Witnesses

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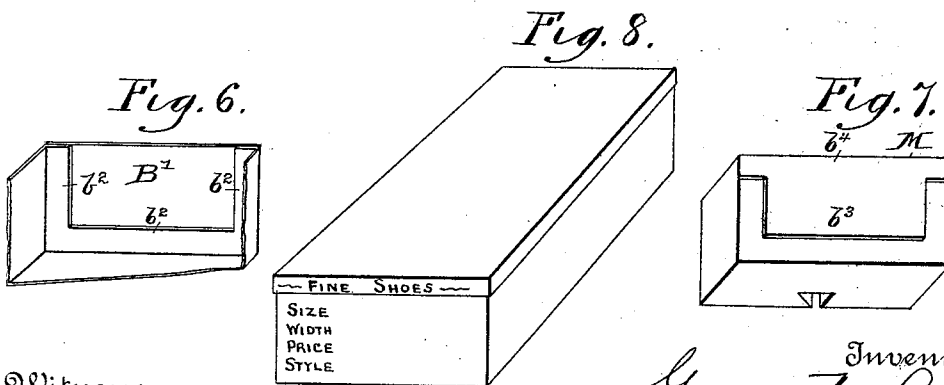
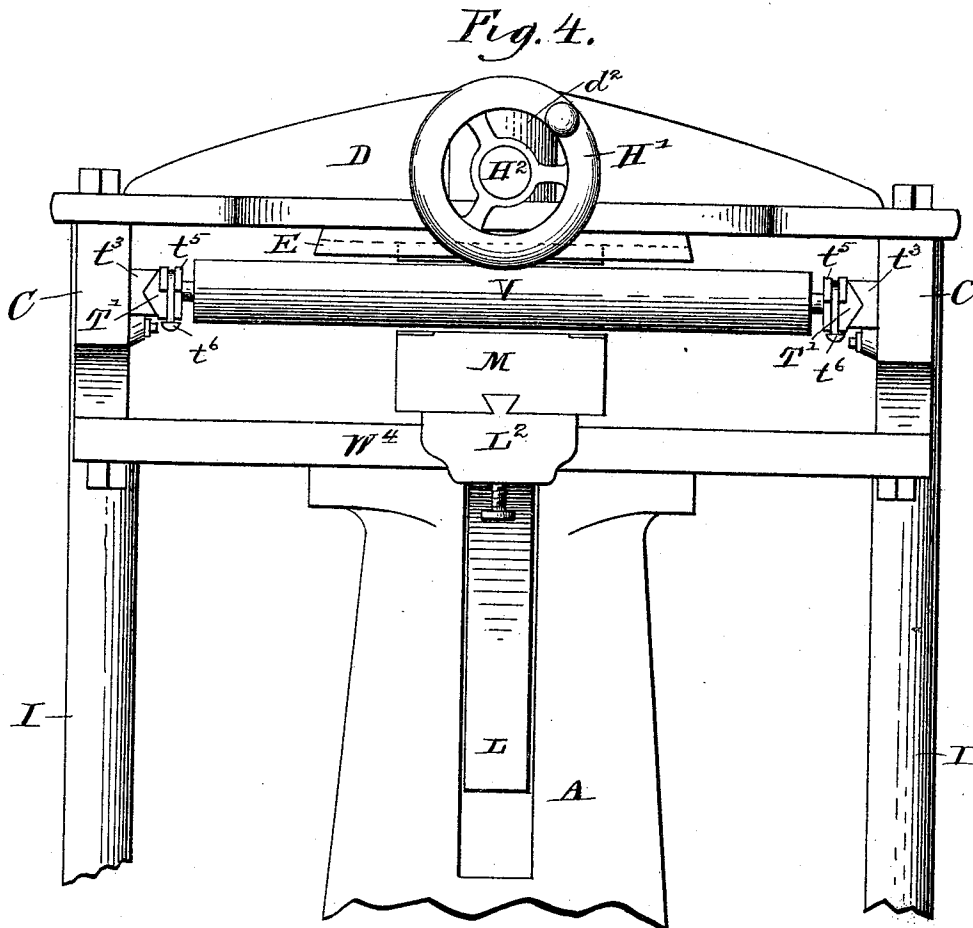
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(No Model.)

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Fig. 10.

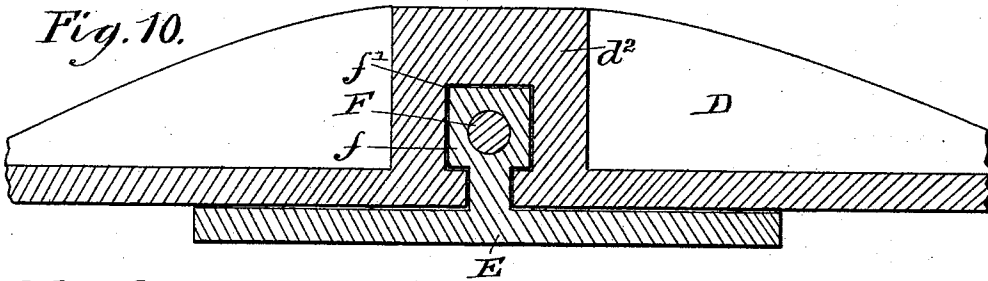


Fig. 9.

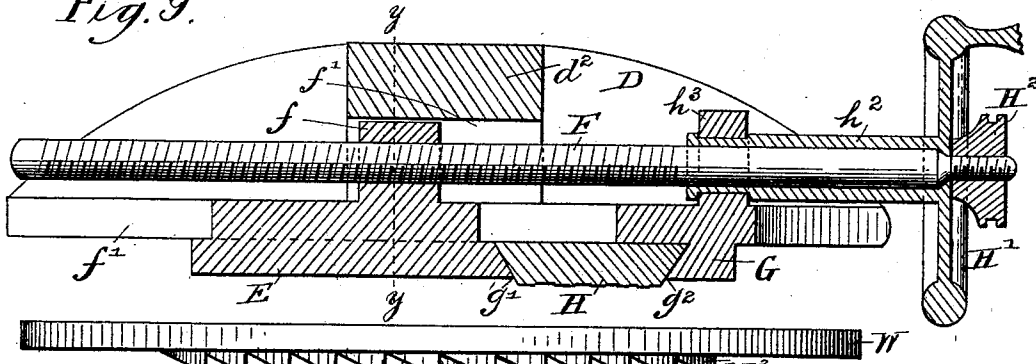


Fig. 11.

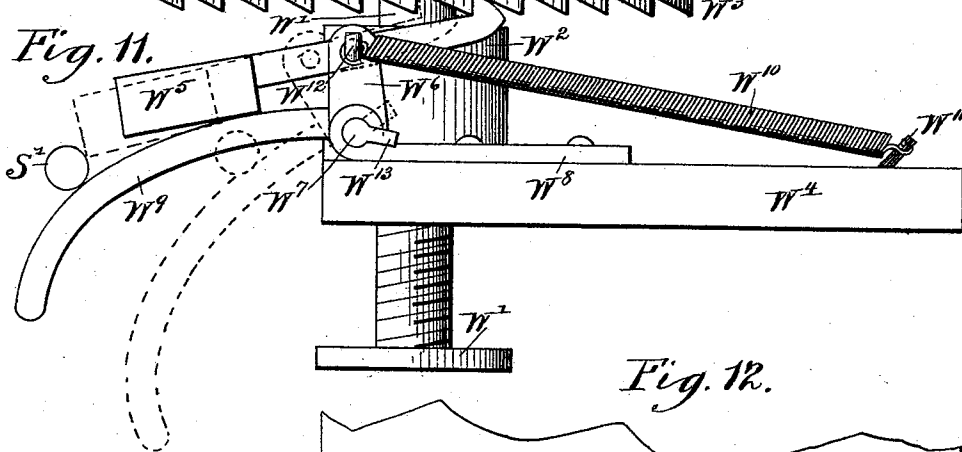
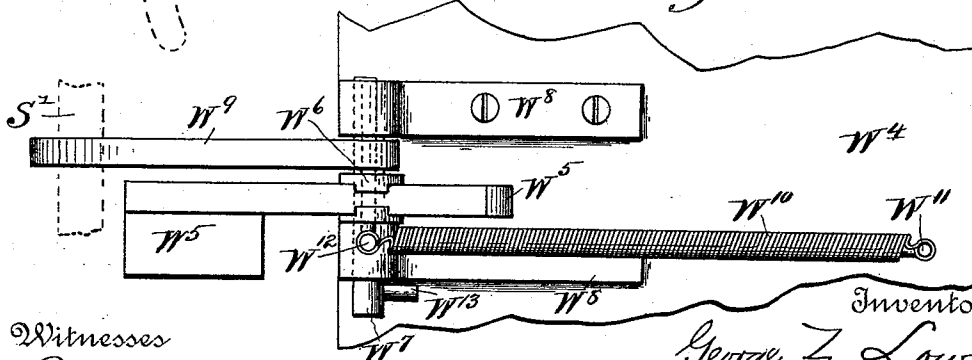


Fig. 12.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE Z. LOWER, OF CARLISLE, PENNSYLVANIA.

BOX-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 495,420, dated April 11, 1893.

Application filed May 2, 1892. Serial No. 431,390. (No model.)

To all whom it may concern:

Be it known that I, GEORGE Z. LOWER, a citizen of the United States, residing at Carlisle, in the county of Cumberland and State of Pennsylvania, have invented certain new and useful Improvements in Box-Printing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a machine for printing on paper and other boxes.

Heretofore it has been the practice in printing labels for boxes to first print the label on a suitable strip, or strips, or sheet of paper, and then finally cover the box with, or paste thereon, such printed material. It is also customary to print directly on boxes made of paper, thin veneer, or other material, before the box is fully formed or completed. Such boxes are known as flat boxes or folded boxes, or uncovered boxes. I am also aware that it is old to print on envelopes, in envelope making machinery, and also to print on other plain surfaces by machinery. But the object of my invention is to take a box after it is fully formed, or covered, and completed, and to print by machinery directly upon such completed box. I thus save the expense and labor of printing on separate paper strips or sheets and then pasting them on the box; and also the labor and expense of constructing a paper box, or other forming machine, and combining with such machine a printing apparatus.

The apparatus constituting my invention is illustrated in the accompanying drawings, in which

Figure 1, is a side view in elevation; Fig. 2, a side central elevation partly in section; Fig. 3, a plan; Fig. 4, a front view of the upper portion of the machine; Fig. 5, a horizontal section of a standard and plunger on line z, z , of Fig. 2; Figs. 6 and 7, details respectively of a box to be printed and a supporting chuck; Fig. 8, a detail of a box showing printed matter thereon; Figs. 9 and 10, enlarged sectional views in detail of the type-plate holder, and locking device; Fig. 9, being a transverse section on the line y, y , of Fig. 10; Fig. 11, an

enlarged side view of the inking table and its operating mechanism; Fig. 12, a plan of the table operating mechanism with the table removed; Fig. 13, a detail of mechanism for adjusting the height of the inking table; Fig. 14, a plan of the inking rollers and carriage; Fig. 15, an end view of an inking roller and its end supports, and Fig. 16, a section on line x, x , of Fig. 14.

Referring to the drawings, A is a central standard of cast iron mounted on a base B, and forming a support for a top bed plate C, which constitutes a seat for the printing and inking devices.

D is a bracket carrying the printing plate, and secured to the top plate C, by screw bolts and nuts d . The bracket D is provided with a sliding piece, E, constituting one side of an electro-type plate holder. The piece E has a lug f extending up into a slot f' , formed in a central boss d^2 on bracket D. Through the lug f , which is internally screw threaded, is passed a screw rod F, and on the outer end of the rod F is carried a wheel H'.

G is a stationary piece, a part of the bracket D, and constituting the other side of the plate holder. One face of the part E is beveled as shown at g' , and the part G is provided with a dove tail g^2 , which beveled portions constitute a seat for an electro-type plate H. In this seat may be placed any desired size of type plate, and the parts E, G, brought together so as to clasp it, by turning the wheel H'.

The wheel H' is provided with a sleeve h^2 which is passed through a collar h^3 , on the fixed piece G. When the type plate is secured in place on its seat by the turning of the wheel H', the wheel itself is locked from turning by means of a lock nut H³ on the extreme end of screw rod F. The top plate C and bracket D are further supported by means of posts, I, rising from the bed plate of the machine.

In the center of cylindrical column A is placed a sliding bar K adapted to slide in ways, k' , formed on the inner sides of column A, as indicated in Fig. 5.

L is an adjustable plunger secured to bar K by a dove tail joint, as also indicated in Fig. 5, and provided with a head L², on which

head is carried a detachable chuck M secured thereto by a dove tail joint. A thumb screw M' is employed passing up through the head L² of the plunger L, to lock the chuck in position on said head. This chuck is placed directly beneath the electro type and is designed to hold the box, or part of the box, on which the printing is done. It is shown in detail in Fig. 7, which is there of a form to fit a box B' shown in Fig. 6. But the chucks may be varied in form as well as the boxes.

In the form of box and chuck shown, the interior of the end of the box is formed with folds, b², on edges of the sides and bottom, and the chuck is cut out on sides and end to bear on said folds so that a plain surface b³ of the chuck abuts against the plain surface of the box. The chuck should, in order to properly support the pressure against the box in printing, be provided with a surface corresponding to the interior surface of the box. The chuck shown is also adapted to be reversed or turned from end to end so as to present a plain edge or surface b⁴ to the plain edge or surface of the end of a box or lid when it is desired to print on such portion. By varying the size and surface of the chuck any sized box can be printed on its top, sides or ends.

O is a screw passed through a lug o', on the bar K, and bearing against the under side of the plunger L, for the purpose of regulating the pressure of the plunger head, L², against the chuck, after the box is placed on the latter, so as to give a lighter or heavier impression of type plate on the box. The screw O is adjusted by means of a thumb nut o², and when adjusted the screw is locked by means of a lock nut o³. Access to this screw and the nuts are had through an opening o⁴, in the column A. The bottom of sliding bar K extends into base B, and is there provided with a roller P bearing directly on the surface of a cam P', on eccentric P², mounted on shaft P³. Shaft P³ carries also a large cog wheel R which engages with a small cog R² mounted on a shaft R³, which latter shaft is operated by any suitable motive power.

An eccentric rod P⁴, of eccentric P², is connected to a rocking lever S, pivoted to the base of the machine. The lever S, at its upper end is secured to the center of a rod S', to the ends of which are attached arms S², to which in turn is secured a carriage T, for carrying a set of inking rollers V. Details of this carriage and rolls are shown in Figs. 14, 15 and 16.

The carriage T is composed of side pieces T', connected by a cross piece T², and are tongued on their edges to enter grooved ways t³, cast on the inner sides of the top bed plate C, and in which ways the carriage slides. The rolls V are supported in sockets in the side pieces T'. Hinged to a lug t⁴ on each of the side pieces is a locking piece, t⁵, each provided at one end with a catch t⁶. The ends of the rolls sitting into half circular sockets

in the side pieces, the locking pieces t⁵ are correspondingly provided with similar sockets to fit the rolls.

Rolls having different inks can, by the means described, be put in, replaced, and locked in position.

W is an ink distributing plate supported on the end of a screw rod, w', passing through post w² of a plate w⁴ cast on top of column A. On its under side the distributing plate is provided with a circular rack W³. The object of the screw w' is to adjust the table in relation to the inking rollers.

W⁵ is a weighted pawl to engage with the rack W³ on the bottom of the distributing plate. The pawl is pivoted on a lug w⁶, which lug is keyed on a rocking shaft w⁷ mounted in two brackets w⁸. Also keyed to the same shaft is a lever W⁹.

W¹⁰ is a coiled spring, one end of which is secured to a pin w¹¹ on plate W⁴, and the other end of the spring is secured to the end of the pivot rod W¹² on which is supported the pawl. On the end of shaft W⁷ is formed a pin or stop w¹³, to limit the movement of the shaft, which operates the pawl and lever, against the action of the spring W¹⁰.

The operation of the machine is as follows: When a box B', is placed in position as shown in Fig. 2, the first movement is to carry forward the inking rollers over the distributing plate, and thence under the printing plate. These rollers do not rotate except when in contact with these two plates. When the lever S reaches the position indicated in dotted lines in Fig. 2, the rod S', to which are attached the arms S², moving the inking carriage, strikes the lever W⁹, thus rotating the shaft W⁷, and this in turn rocks the lug W⁶ on which the pawl W⁵ is mounted. The pawl engages with a tooth on the circular rack on bottom of distributing plate and carries the plate the distance of one notch. When the inking rolls recede the vertical sliding bar K is lifted by the cam and eccentric carrying upward the plunger L, its head, the chuck, and the box, forcing the latter against the electro type or printing plate.

Having thus described my invention, what I claim is—

1. In a machine of the character described, in combination with a stationary printing plate, a vertical moving plunger, and a detachable chuck carried on the head of said plunger, said chuck adapted to fit in and support the article to be printed, substantially as described.

2. In a machine of the character described, the combination with cam and eccentric mechanism, a vertically moving slide bar and plunger operated intermittently by said mechanism, a chuck carried by said plunger and supporting the article to be printed, a stationary electro, or other printing plate, a carriage provided with inking rolls, a lever and arms attached to said carriage, said lever connected to said eccentric mechanism for giving the

said carriage a reciprocating movement, substantially as described.

3. In a machine of the character described, the holder for carrying the printing plate composed of two parts, one movable and one stationary, the said parts provided with opposite beveled faces to form a seat for the said plate, and a screw rod attached to the movable part for bringing it toward the stationary part and holding the plate in place, substantially as described.

4. The combination of the chuck and plunger, and vertical plunger head connected by a dove tail joint, and a thumb screw passing through the vertical plunger head into the chuck to hold the latter in position, substantially as described.

5. In a machine of the character described, in combination with the central supporting column, the vertical bar sliding in grooves with which said column is internally provided a roller on the lower end of said bar, a cam operating mechanism connecting with said roller, and a plunger secured to said sliding bar by a dove tail joint, substantially as described.

6. In combination with the supporting column the vertical sliding bar, and the plunger and plunger head, said plunger sliding in grooves in said vertical bar, and a screw secured to said sliding bar and bearing against the under side of said plunger to regulate the pressure of the plunger head carrying the article to be printed against a stationary printing plate, substantially as described.

7. In a machine of the character described, in combination with the operating cam and eccentric mechanism, a lever pivoted to the bed of the machine and connected to the ec-

centric rod, arms connected with upper end of said lever, a sliding carriage connected to said arms, inking rolls secured to said carriage so as to turn loosely therein when coming in contact with the distributing plate and printing plate, but otherwise not turning, and said distributing and printing plate, substantially as described.

8. In a machine of the character described, the carriage carrying the inking rolls composed of the side pieces with a V edge engaging with V grooves formed on the inner sides of a top supporting plate, the said side pieces formed with half circular sockets to support the ends of the rolls, locking strips pivoted to said side pieces and provided with corresponding sockets to fit over the rolls, and a catch on each of said locking pieces to lock the rolls in the said carriage, substantially as described.

9. In a machine of the character described, the distributing plate, provided on its under side with a circular rack in combination with a weighted pawl to engage with said rack, a partially rotating shaft with which said pawl is connected a tripping lever connected to same shaft, a coiled spring to rotate said shaft, a stop to control the action of said spring and prevent complete rotation of shaft and a lever and eccentric mechanism to give said parts an intermittent action, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE Z. LOWER.

Witnesses:

GEO. W. NEIDICH,
JNO. Q. HENRY.