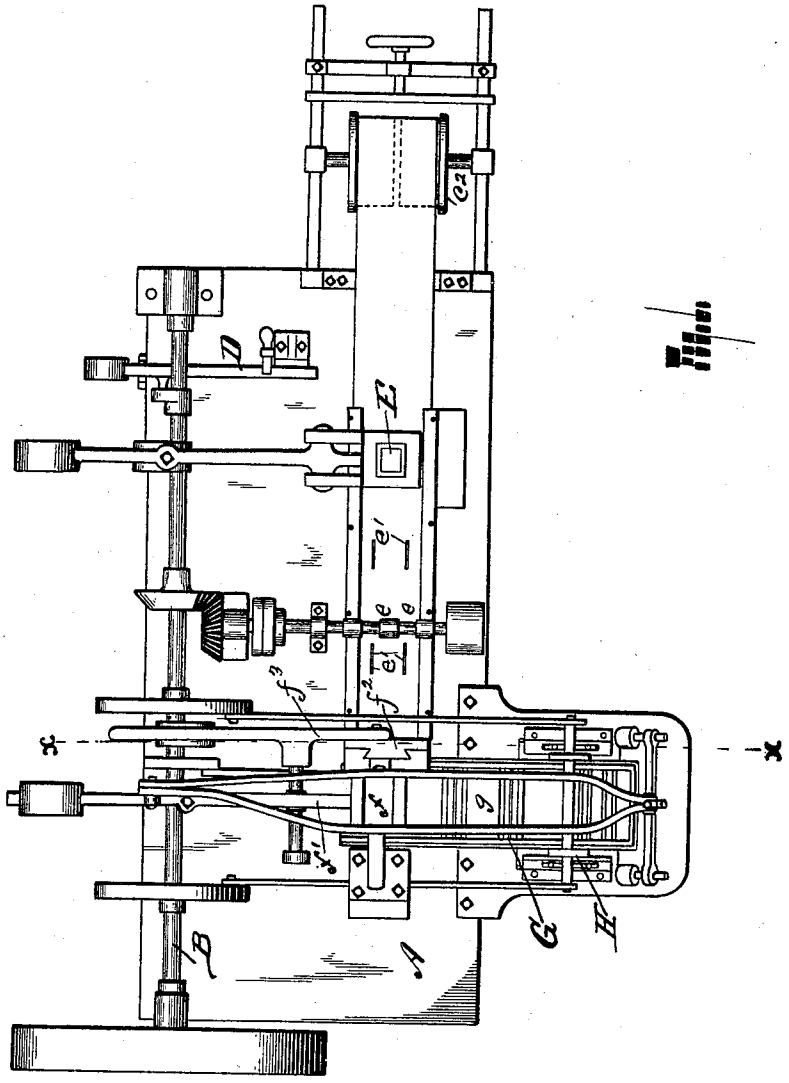
No. 635,804. Patented Oct. 31, 1899.

L. R. PERRY.

MACHINE FOR MAKING BOXES.

(Application filed Jan. 23, 1896.)

(No Model.) 4 Sheets—Sheet 1.



WITNESSES

T. W. Hager

G. M. Davis.

INVENTOR

Laurence R. Perry

By Fisk & Thomas

Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 635,804. Patented Oct. 31, 1899.

L. R. PERRY.

MACHINE FOR MAKING BOXES.

(Application filed Jan. 23, 1896.)

(No Model.) 4 Sheets—Sheet 2.

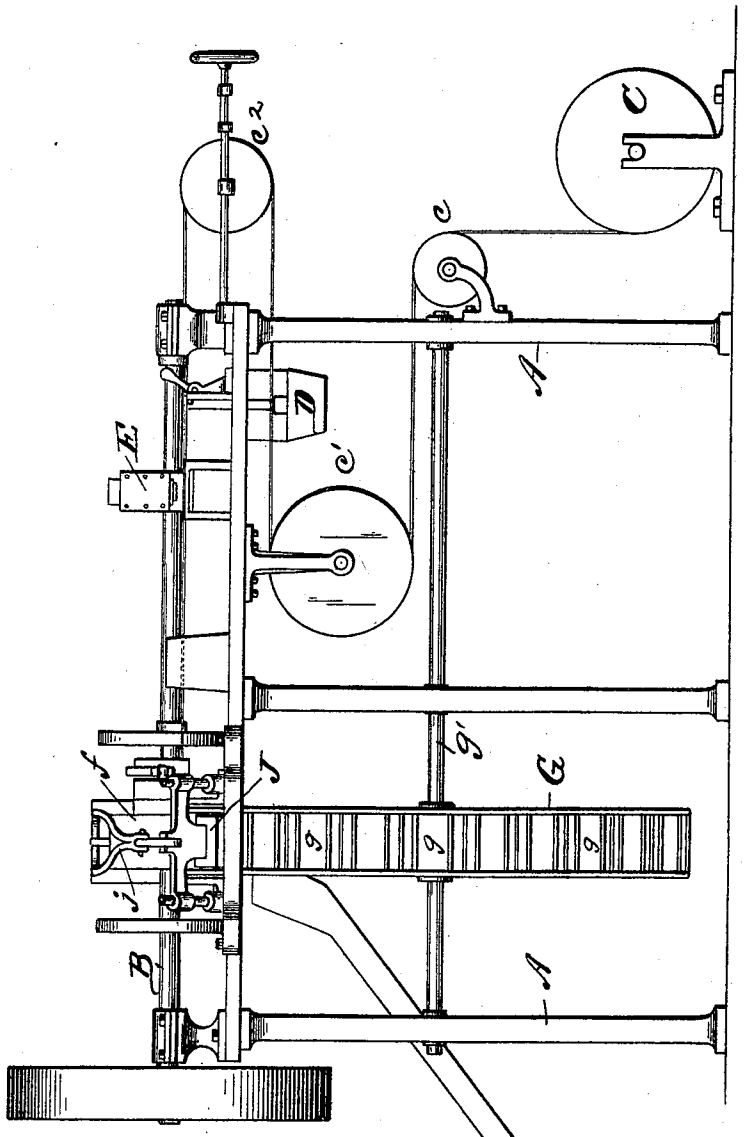


Fig. 2.

WITNESSES

Jr. W. Prager

G. M. Davis.

INVENTOR

Lawrence R. Perry

By Dick Thomas

atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 635,804. Patented Oct. 31, 1899.

L. R. PERRY.

MACHINE FOR MAKING BOXES.

(Application filed Jan. 23, 1896.)

(No Model.) 4 Sheets—Sheet 3.

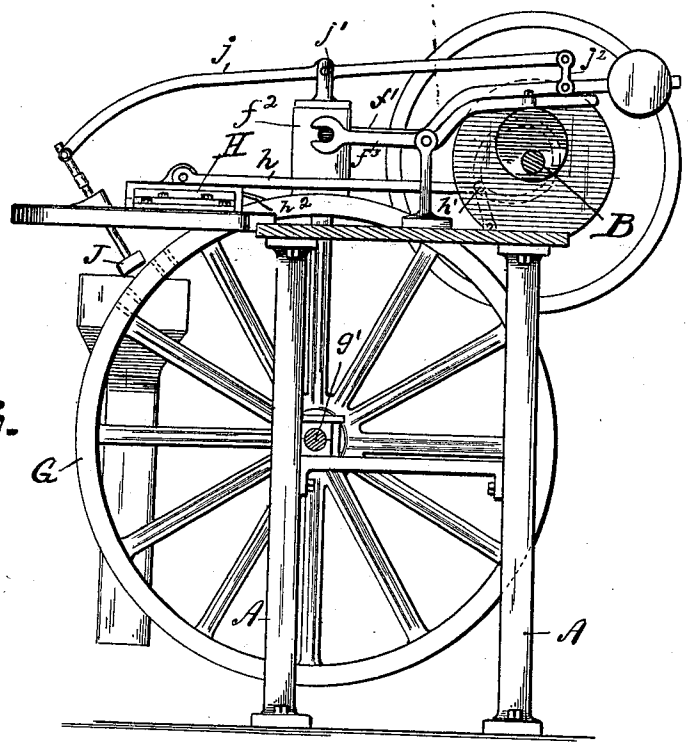


Fig. 3.

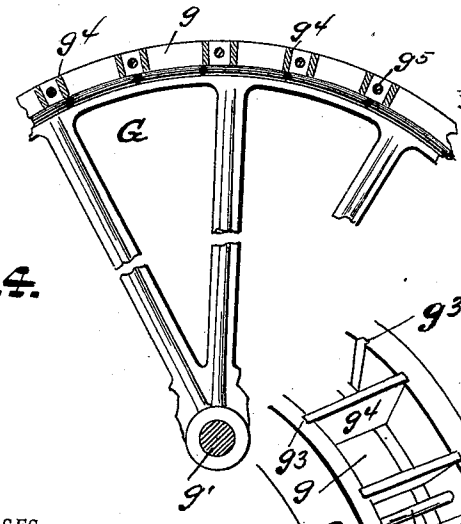


Fig. 4.

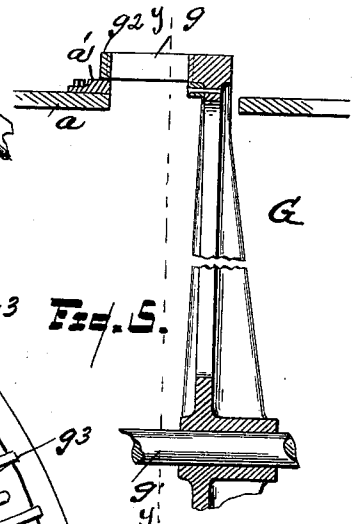


Fig. 5.

Fig. 6.

WITNESSES

Jr. N. Stager

G. M. Davis.

INVENTOR

Laurence R. Perry

By Fisk & Thomas

attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 635,804. Patented Oct. 31, 1899.

L. R. PERRY.

MACHINE FOR MAKING BOXES.

(Application filed Jan. 23, 1896.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 8.

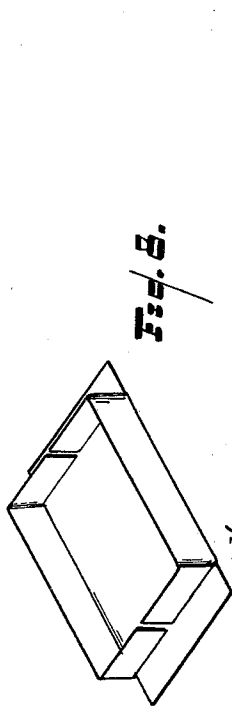
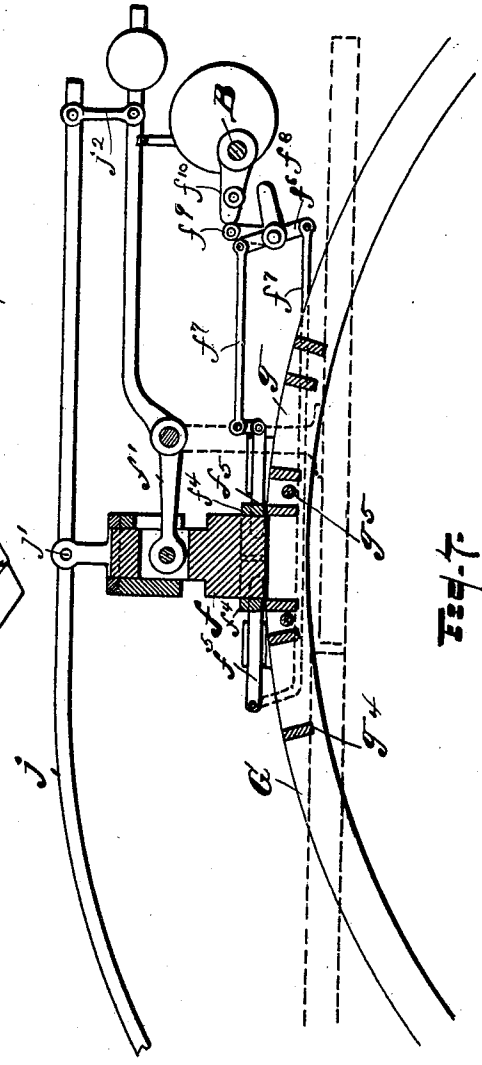


Fig. 7.



WITNESSES

G. M. Davis.

A. F. Ebeling.

INVENTOR

Laurence R. Perry

By Fisk & Thomas

Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LAWRENCE R. PERRY, OF DETROIT, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE IMPROVED MATCH COMPANY, OF SAME PLACE.

MACHINE FOR MAKING BOXES.

SPECIFICATION forming part of Letters Patent No. 635,804, dated October 31, 1899.

Application filed January 23, 1896. Serial No. 576,527. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE R. PERRY, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Machines for Making Boxes; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in machines for manufacturing boxes, more particularly match-boxes; and it consists in the main in the substitution of a wheel having box dies or pockets on its periphery in the place of the traveling dies or pockets carried forward by the chain mechanism.

Machines having traveling pockets connected together have been used for the purpose of providing a series of such pockets, each adapted to move away from under the former-plunger as soon as it is filled with the box, carrying the box with it and holding it in proper form a sufficient length of time to allow the glue to set and then returning to the position under the former-plunger to receive another box. Heretofore in the machines in common use these several pockets have been attached to an endless chain supported on suitable carriers and operated by suitable intermittent feeding mechanism, whereby the several pockets are carried to and from the former-plunger and box-forming mechanism. The objection to this form of device is that it is not positive in its movement, that it is unwieldy, noisy, and not capable of a movement quick enough to give great speed to the machine. I overcome these objections by dispensing altogether with the endless-chain mechanism and substituting in the place of it a wheel mounted upright in the frame underneath the table of the machine, having several boxes or dies equally distributed around the periphery of the wheel, the wheel and pockets being so located that the pockets will come directly under the former-plunger as the wheel is moved forward. In addition to the use of the wheel in place of the endless chain I employ a suitable mechanism for punching boxes from the pockets after they have been retained a sufficient time to allow the glue to set. The means employed by me for giving the wheel the proper intermittent movement consists in a sliding head provided with a dog which engages one of the pockets and as the head is moved carries with it the wheel the distance between the two pockets. I also employ operating-fingers for folding the free ends of the sides of the boxes around the ends similar to those before employed, but having a movement in both directions through a cam-groove.

My improvement is shown in the accompanying drawings, in which—

Figure 1 is a plan view of the machine, showing such details as are necessary to illustrate my improvement. Fig. 2 is a side elevation showing the several operating devices commonly combined in this machine with my pocket-carrying wheel. Fig. 3 is a sectional view on line $x\,x$ of Fig. 1. Fig. 4 is a vertical section of portions of the wheel on line $y\,y$ of Fig. 5. Fig. 5 is a vertical cross-section of portions of the wheel. Fig. 6 is a detail in perspective of a portion of the wheel. Fig. 7 is a vertical cross-section on line $z\,z$ of Fig. 2. Fig. 8 is a view showing the condition of the blank before it is forced into the pockets in the wheel.

A is the frame or table of the machine.

B is the main driving-shaft.

C is the paper-roll from which the paper is unwound and from which it is passed over the rolls c c' c^2 on its way to be operated upon by the several forming devices of the machine. The paper is glued at points an equal distance apart between the rolls c' and c^2 by the gluing mechanism D. This gluing device is common to these box-forming machines, and consists simply in means for giving the glue-pad an intermittent movement through the operation of the cam on the main driving-shaft. After receiving the glue the paper is carried forward over the roll c^2 and is first operated upon by the slitting device E, by which slits e' e' are cut in the paper at the point where it is cut off later, leaving both ends of the blank slitted from the end. The paper is then carried forward to the

forming device, where the blank is cut off by the cutter f^2, operated by the lever f^3. The roll is fed from the main shaft by the feeding-rolls *e e*. The box-forming device is that commonly used in these machines and is shown in Figs. 1, 2, and 7. This forming device consists of a former-plunger *f*, operated by a lever *f'*, which is operated by a cam on the main shaft. The former-plunger has a vertical movement properly timed and strikes the blank in the center and forces it down between the walls f^4 f^4, by which the sides are turned up. The former-plunger then rests a sufficient length of time to allow the operating-fingers f^5 f^5 to move forward and fold the loose portions of the sides inward, as shown in Fig. 8. The former-plunger then moves downward again, forcing the partially-formed box into the pocket in the wheel, where the ends are folded and stuck fast and the box completed and where the box remains when the former-plunger is withdrawn. The fingers f^5 f^5 are caused to move back and forth in opposite directions and simultaneously by means of the rocking lever f^6, through the connecting-rods f^7 f^7, which connect the folders, respectively, with the upper and lower end of the lever. The rocking lever is operated by the rock-shaft on which it is mounted and the arms f^8 f^9, which come in contact with an arm f^{10} on the main shaft B at different times and by which the rock-shaft is moved in opposite directions, the movement being so timed as to cause the folders to move when the loose flaps are to be folded in. Suitable devices are also employed to catch the edge of the box when the former-plunger is withdrawn to prevent it coming back with the former-plunger.

All of the devices described up to this point are constructed and operated substantially as in the old machines and need not be described with any more details.

G is a wheel mounted transversely in the machine on the shaft *g'*. This wheel is formed in cross-section, as shown in Fig. 5.

g^2 is a ring set off to one side of the rim of the wheel a distance approximately equal to the length of the box to be made. The rim of the wheel on the side facing the ring g^2 and the face of the ring facing the rim are each provided with radial grooves g^3, in which are set small cross-plates g^4 in pairs, which are clamped tight by means of the bolts g^5. The wheel is provided with a series of these cross-plates in pairs all the way around the periphery, the space between two pairs forming a pocket of a size inside equal to the outside size of the box to be made. The plunger that forms the box, as before described, forces it into this pocket, and as soon as the plunger has been withdrawn the wheel is carried forward a sufficient distance to bring the next pocket under the plunger and the blank. This forward movement of the wheel is produced by means of the sliding head H, which is given a reciprocating movement with each revolution of the driving-shaft through the connecting-rod *h*, operated by the cam-groove *h'*. (Shown in Fig. 3.) The sliding head is provided with a dog h^2, which drops into one of the pockets of the wheel and carries it forward as the head moves. The wheel is stopped with the next pocket directly under the former-plunger. The box after having been placed and left in the pocket by the former-plunger remains in it until the wheel has made nearly one complete revolution, when the box is forced out by the delivery-plunger J, operated by the lever *j*. The delivery-plunger J is supported on a plunger-rod set at an incline having a bearing in a block forming a part of the table. This delivery plunger-rod is connected at the upper end with a horizontal lever *j*. This lever is pivoted at *j'* on the top of the frame in which the main delivery-plunger is mounted, and extends beyond this frame, where it has a link connection j^2 with the lever-rod which operates the main plunger or former device *f*. This construction is such that the plunger *f* forming the box and the one discharging another box from the wheel are operated simultaneously and when the wheel is at rest. The glue is thus given time to set before the box is removed from the pocket.

a is a portion of the table which extends under that portion of the wheel that is above the table.

a' is a metal piece screwed to the table directly under the ring g^2, and constitutes a support for this ring when the former-plunger forces the box into the pocket and prevents the breakage of the wheel if the former-plunger should not register with the pocket. Any suitable means may be employed for locking the wheel in the exact position necessary to cause the former-plunger and the box to register.

What I claim is—

1. In a box-forming machine, the combination of the frame, a wheel mounted upright in the frame provided with pockets in its periphery, a plunger mounted in the frame over the wheel and adapted to enter the pockets to act in conjunction with said pockets to form the boxes, and means for folding the side flaps of the boxes before the blanks enter the pockets, substantially as described.

2. In a box-forming machine, the combination of the frame, a wheel mounted upright in the frame provided with pockets through its periphery, a former-plunger mounted in the frame over the wheel and adapted to enter the pockets in the periphery of the wheel to act in conjunction therewith to form the boxes, and means for forcing the boxes through the rim to the inside, substantially as described.

3. In a box-forming machine, the combination of the frame, a wheel mounted upright in the frame having its periphery extending to one side of the spokes, said periphery extending above the table and overlapping a horizontal extension thereof pockets formed

through the periphery, and a former-plunger adapted to act in conjunction with the pockets in the periphery to form the boxes the construction being such as to support the overhanging periphery of the wheel when the boxes are forced into the pockets, substantially as described.

4. In a box-forming machine consisting of the frame, the upright wheel and the plunger, a delivery mechanism consisting of a plunger mounted in the frame, a horizontal lever having a pivot at its center above the frame and one end pivoted to the delivery plunger-rod and the opposite end connected with the means employed for operating the main plunger or forming device whereby the delivery-plunger is operated simultaneously with the main plunger while the carrying-wheel is at rest, substantially as described.

5. In a box-forming machine, the upright carrying-wheel provided with a series of pockets, said pockets formed by the combination of the rim of the wheel, an independent ring, cross-plates between the rim and the ring, and means for holding them together, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

LAWRENCE R. PERRY.

Witnesses:

CHARLES H. FISK,

G. M. DAVIS.