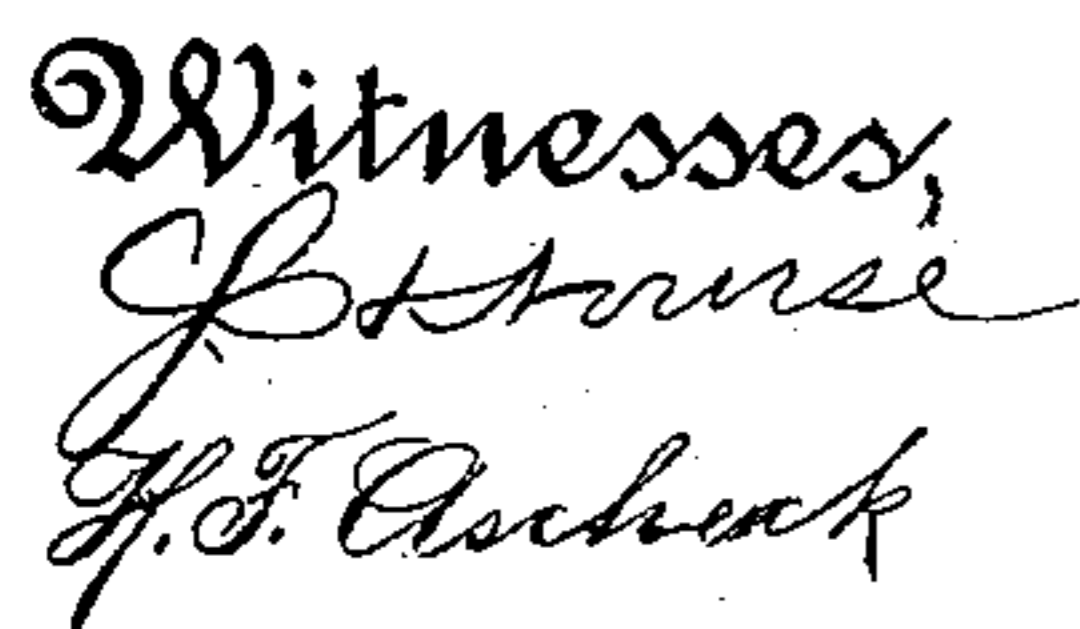


2 Sheets—Sheet 1.

No. 477,362.

Patented June 21, 1892.



Inventors,
George Grisel
Frank Severis
By Dewey & Co. atty

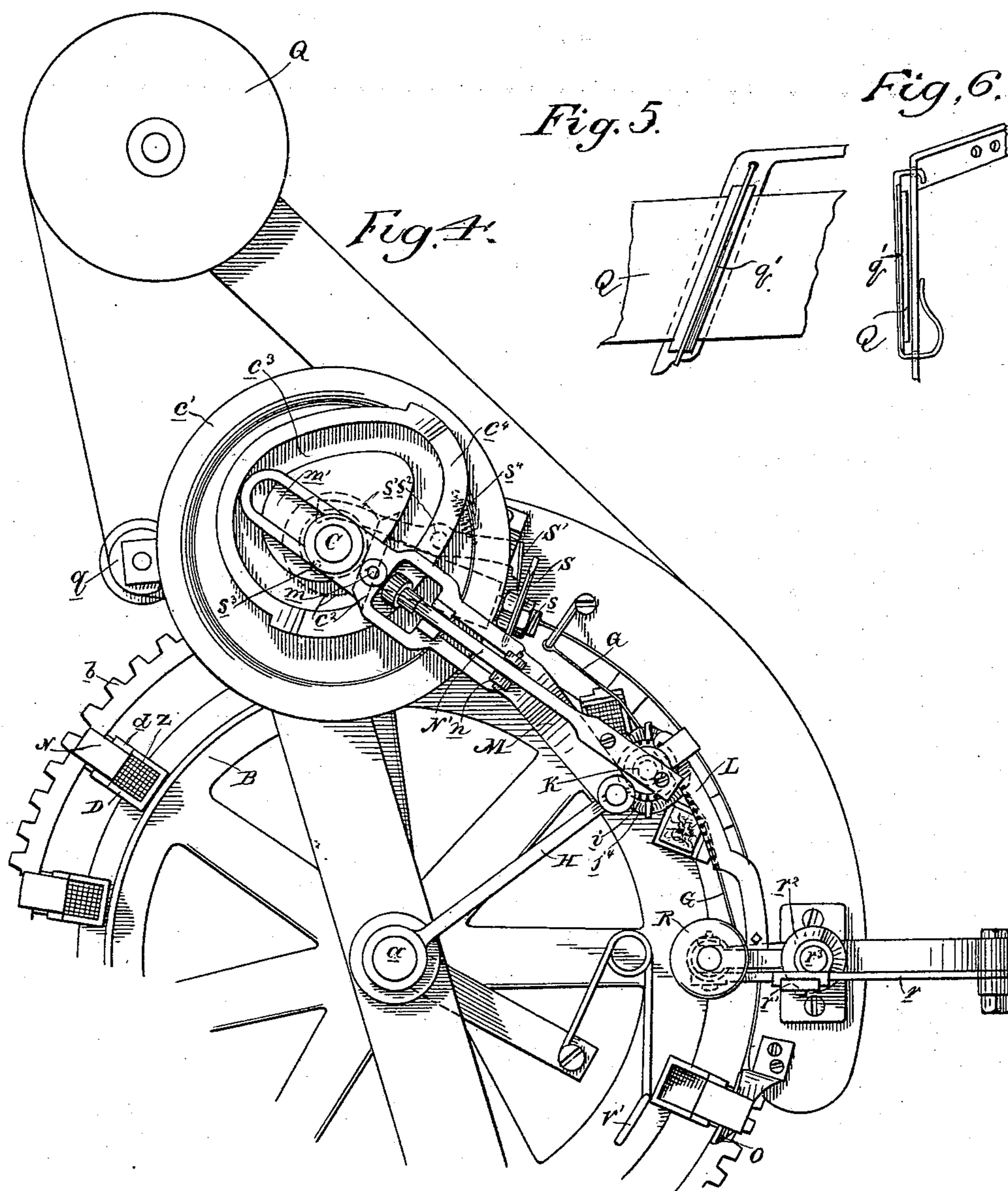
(No Model.)

2 Sheets—Sheet 2.

G. GRISEL & F. SEVERIO.
MACHINE FOR WRAPPING BLOCK MATCHES.

No. 477,362.

Patented June 21, 1892.



Witnesses,
J. H. Hourse
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UNITED STATES PATENT OFFICE.

GEORGE GRISEL AND FRANK SEVERIO, OF SAN FRANCISCO, CALIFORNIA,
ASSIGNORS OF ONE-THIRD TO JOSEPH D. CASE, OF SAME PLACE.

MACHINE FOR WRAPPING BLOCK-MATCHES.

SPECIFICATION forming part of Letters Patent No. 477,362, dated June 21, 1892.

Application filed February 18, 1891. Serial No. 381,968. (No model.)

To all whom it may concern:

Be it known that we, GEORGE GRISEL and FRANK SEVERIO, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Machines for Wrapping Block-Matches; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to the class of wrapping-machines, and especially to that wrapping-machine exemplified by Letters Patent of the United States No. 419,851, dated January 21, 1890, granted to George Grisel, the particular object of which machine is to wrap the paper around the composition ends of block-matches. These matches are ordinary sulphur-matches, made in splints formed by splitting or cutting blocks of wood down a certain distance, so that the splints all hold together by a web below. It is usual to wrap with paper the upper or composition ends of the blocks to protect them.

Our present invention consists in certain improvements, hereinafter fully described and specifically claimed, upon that machine described and illustrated in the above-named Letters Patent, and to which reference may be had for a more perfect understanding of the present case.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a perspective view of a portion of the machine, showing our several improvements. Fig. 2 is a sectional view of the twisting mechanism, the fingers being closed. Fig. 3 is an elevation of same, the fingers being open. Fig. 4 is a plan view. Fig. 5 is a detail of the spring-directing plate q' and its adjuncts. Fig. 6 is a side view of the same. Fig. 7 is a detail showing in perspective the finger j engaging the severed edge of the paper.

We have not deemed it necessary in the present case to show the complete machine, as much of it remains the same as the machine heretofore patented by George Grisel; but we have shown sufficient to convey a perfect understanding of our present improvements. There is a bed-plate to the machine from which rises a vertical pin a , upon which

is mounted and adapted to be rotated the holder-carrier wheel B, a portion of which is here shown. This wheel is provided with a cogged rim b , with which a pinion on the lower end of the drive-shaft C meshes. The upper end of said shaft C is provided with a pulley c' or other device for transmitting power. By means of this pulley and the vertical shaft C and the pinion below the holder-carrying wheel B is rotated.

D are the holders for the match-blocks. These are similar in every respect to those heretofore patented, and may be briefly described as four-sided sockets, one of the sides d being hinged, so that it forms a flap to open and close the holder, and said flap has a clamp N and a cam-lug d^5 . Springs d' on the side of the holder hold the flap either open or closed. The holders have downwardly-extending spindles passing through the carrier-wheel and are provided with pinions d^3 on the lower ends and also with fixed curved guides d^4 , as heretofore.

Secured firmly to the upright center pin a at a point below the holder-carrying wheel is fixed a guide-wheel E, against the rim of which the guides of the holder-spindles move, whereby the spindles of the holders are held in a fixed position for a portion of their revolution. This guide-wheel is the same as in the patent referred to and need not be herein fully illustrated.

Upon one portion of the rim of the guide-wheel is a curved rack e' , with which the pinions of the holder-spindles engage when they reach said rack, whereby the holders are given a rotary motion, as heretofore. From this construction it follows that as the carrier-wheel is revolved it carries all the holders with it, said holders remaining stationary throughout the greater portion of the revolution, and only turning when they reach the rack portion of the guide-wheel. This turning is taken advantage of to effect the wrapping of the paper about the block Z, which is placed in the holder.

Q is the roll of wrapping-paper, the end of which is brought around a guide-roll q and thence passes through a spring-directing plate q' , in which position it lies directly against the side of the match-block and stands on

edge. At this time the cam-lug d^5 of the hinged flap d of the holder comes in contact with and travels upon a cam o , which causes the flap to move up to a vertical position and thereby closes the holder and causes its clamp N to bind the paper against the side of the match-block. The holder proceeding draws the paper along with it, and then the holder, beginning to turn, winds the paper around the block. This winding continues, and when it has proceeded to a complete wrapping up (to which point the operation of the machine is the same as that heretofore patented) then the cutting apparatus comes into play to cut the paper off into the proper length for that particular block.

Our present cutting apparatus is as follows: It consists of two knives S and S' . The knife S makes a complete revolution in a vertical plane and passes through and cuts the paper as it passes its lower vertical position. This knife is mounted upon a horizontal shaft s , which derives its motion by means of beveled pinions c^2 , operated from the power-shaft C . The opposing knife S' is mounted upon a horizontal arm s' , pivoted on a vertical pin s^2 and controlled by a spring s^4 , said arm extending to and adapted to be engaged by a revolving pin s^3 , carried by the power-shaft C . The operation is as follows: Just before the revolving knife reaches the paper the pin s^3 , coming in contact with the end of the arm s' , forces said arm back, thereby throwing the knife S' at the other end forward firmly against the paper. Then the revolving knife S cuts through the paper and begins to ascend, while the vibrating knife is withdrawn by its spring, the end of its arm being relieved by the pin s^3 . By this construction no provision need be made, as heretofore, in the case of a horizontally-revolving knife, to avoid any interference with the paper roll, as the revolving knife clears it entirely, except where it traverses its path and cuts through it.

G is a flexible strap similar to the strap of the former patent and against which the rotating block bears as it wraps the paper upon itself, thereby insuring a close fit to the block.

The twisting mechanism by which the upper projecting end of the paper is caught and twisted down onto the top of the block is as follows: H is an arm, the inner end of which is pivoted upon the central shaft or pin a , whereby said arm can swing through an arc horizontally. In the outer end of this arm is journaled a stock I , which can rotate in its bearing. In the lower end of this stock are carried the swinging fingers J . These consist of several bars, (here shown as four in number,) said bars having at their lower ends curved portions j , all turned in the same direction, and one of said fingers carries a wire j^5 . These fingers are pivoted in the stock at j' and their heads are formed with teeth j^2 . In a suitable groove j^3 in each finger at a point just below its pivotal center is mounted an annular spring j^4 , completely encircling all the

fingers. The object of curving the lower ends of the fingers J , as stated, is to enable them to better bear upon and hold the paper in grasping it, and by being thus curved in the same direction they avoid interference and evenly and compactly press the paper all around. Fitted vertically and adapted to slide up and down in the stock I is a rod K , which passes upwardly through the stock and has a spring k upon its upper end, which serves to hold it up. The lower end of this rod is provided with teeth k' , which engage the teeth on the heads of the fingers. The upper portion of the stock I is provided with a pinion i , which engages a fixed rack L . Upon the pulley of the power-shaft C is formed a cam-groove c^3 , in which is mounted a roller-stud m , carried by a link M , which is connected with the swinging arm H , and is guided at its other end by a groove m' , fitting over the power-shaft. Upon the pulley c' is also formed a cam-track c^4 , upon which is adapted to travel the roller end of a lever N' , pivoted at n in the link M , and having its other end lying above and adapted to be pressed down upon the rod K . The operation of these parts is as follows: As the match-block proceeds, being rotated by its holder, the roller end of the lever N' travels upon the inclined plane or cam-track c^4 , whereby the other end of said lever is pressed down upon the rod K . This downward movement of the rod, through the engagement of its toothed lower end with the toothed heads of the fingers, causes said fingers to rise in diverging arcs until they are spread out in horizontal radial planes and are lifted up by this spreading to a plane above the upper edge of the paper. In this position the upper spring k is compressed, and the lower encircling spring j^4 , being now raised by the fingers to a point a little above their pivotal centers, assists in holding said fingers in their elevated position. During this movement the roller-stud m of the link M is traveling outwardly in the cam-groove c^3 , whereby said link is moved, which effects the swinging of arm H and the stock I , thereby causing the fingers to approach the oncoming and wrapping match-block—that is to say, the match-block and fingers are moving in directions toward each other, and as the finger-stock moves in this direction its pinion, engaging the fixed rack, causes the stock to rotate, this rotation, however, in this direction being of no importance. The movement toward each other continues until the match-block and the lower end of the stock have approached each other nearly to the vertical line, in which position the divergent fingers surround the upper end of the wrapping-paper. At this moment the roller end of the lever N begins to descend from the cam-track c^4 , thereby raising its other end from the upper end of the rod K , and the spring of the rod now throws it upwardly, thereby, through the engagement of its lower end with the fingers, causing said fingers to come down toward a vertical plane

on converging lines. When they nearly reach this plane, they are directly over and completely surround the projecting end of the paper around the match-block, and as they reach the vertical plane they close in from all sides on the paper and clamp it in a compressed condition between them. The encircling spring j^4 holds them well in this position and clamps them on the paper. Now the link-stud m having reached the end of its movement, the link begins to return and swings the arm H with the finger-stock on the return movement. Now by reason of the engagement of the pinion of the stock with the rack the fingers rotate, still clamping and holding the paper between them, and as they rotate in one direction and as the match-block holder rotates in the other direction the projecting end of the paper is rapidly and tightly twisted down upon the head of the match-block. This continues until the end of the movement is reached, when the first movement again takes place, the fingers opening and proceeding toward the next oncoming match-block. The object of the wire j^5 on the lower end of one of the fingers is to extend out to and engage the end of the paper and fold it closely in upon the block as the fingers begin to turn.

R is a weighted plunger, the end of which is above and is adapted to come down upon the top of the twisted paper on the match-block after it has left the twisting-fingers. This plunger is operated by means of a swinging lever r against a tappet r' , of which a cam r^2 operates, said cam being on a shaft r^3 , which derives its motion by means of a pinion r^4 on its lower end engaging the cogged rim of the holder-carrying wheel. Now as the wrapped and twisted block approaches the plunger rises, and just when the block gets to a point directly under said plunger the latter is dropped and presses the twisted end of the paper down closely upon the match-block. The holder of the match-block is opened, as heretofore, by means of the cam-lug d^5 of the hinged flap d coming under a cam O , which presses it down, and thereby opens the hinge-flap, and the match-block is thrown out of the holder by means of a small spring-wire V' , which lies partly in the path of travel of the holder, its position being such that as the holder passes it, it is forced back, and at the moment the block is free, it is relieved of the holder and flips the block out.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for wrapping block-matches, the means for cutting the paper strip into lengths, consisting of the vertically-revolving knife S , the horizontal rotary shaft carrying said knife, the opposing vibrating knife S' , the pivoted horizontal arm on which said knife S' is carried, and mechanism from the power-shaft for rotating the horizontal shaft

and vibrating the horizontal arm, substantially as herein described.

2. In a machine for wrapping block-matches, the means for cutting the paper strip into lengths, consisting of the vertically-revolving knife S , the horizontal rotary shaft carrying said knife, the opposing vibrating knife S' , the pivoted spring-controlled horizontal arm, on which said knife S' is carried, the power-shaft C , gearing between said power-shaft and the horizontal shaft to rotate it, and the pin s^3 on the power-shaft for effecting the vibration of the horizontal arm, substantially as herein described.

3. In a machine for wrapping block-matches, and in combination with traveling match-block holders, a set of swinging and revolving fingers for grasping and twisting the projecting end of the paper down upon the match-blocks, and a swinging arm carrying said fingers, whereby they are moved to meet and then to accompany each advancing match-block, substantially as herein described.

4. In a machine for wrapping block-matches, and in combination with traveling match-block holders, a set of swinging and revolving fingers for grasping and twisting the projecting end of the paper down upon the match-blocks, a stock carrying said fingers, and gearing to rotate the stock, substantially as herein described.

5. In a machine for wrapping block-matches, and in combination with traveling match-block holders, a set of swinging and revolving fingers for grasping and twisting the projecting end of the paper down upon the match-blocks, a swinging arm, a stock carried by the arm and carrying the fingers, and the means for rotating the stock and causing the fingers to be moved to meet and then to accompany the advancing match-blocks, consisting of the pinion on the stock, the fixed rack with which said pinion engages, and means for swinging the arm, substantially as herein described.

6. In a machine for wrapping block-matches, and in combination with traveling match-block holders, a set of swinging and revolving fingers for grasping and twisting the projecting end of the paper down upon the match-blocks, a swinging arm, a stock carried by the arm and carrying the fingers, and means for rotating the stock and causing the fingers to be moved to meet and then to accompany the advancing match-blocks, consisting of the pinion on the stock, the fixed rack with which said pinion engages, and means for swinging the arm, consisting of a rotating shaft, a cam-groove on said shaft, and a link connected with the arm and engaging the cam-groove, substantially as herein described.

7. In a machine for wrapping block-matches, the set of fingers for twisting the projecting end of the paper down upon the top of the match-block, said fingers having bent lower ends curved in the same direction, substantially as herein described.

8. In a machine for wrapping block-matches, the set of fingers for twisting the projecting end of the paper down upon the top of the match-block, said fingers having bent lower ends curved in the same direction, one of said fingers having the wire for folding in the edge of the paper, substantially as herein described.

9. In a machine for wrapping block-matches, the set of swinging twister-fingers, means for opening and closing the same, and the encircling spring to assist in holding said fingers open and closed, substantially as herein described.

10. In a machine for wrapping block-matches, the means for twisting the projecting end of the paper down upon the match-blocks, consisting of the rotating stock, the set of fingers pivoted in its lower end and having toothed heads, and the vertically-movable rod in said stock, having teeth engaging the toothed heads of the fingers, whereby they are spread and closed, and a swinging arm for said stock, whereby the fingers are brought to position over the match-blocks, substantially as herein described.

11. In a machine for wrapping block-matches, the means for twisting the projecting end of the paper down upon the match-blocks, consisting of the rotating stock, the set of fingers pivoted in its lower end and having toothed heads, and the vertically-movable rod in said stock having teeth engaging the toothed heads of the fingers, whereby they are spread and closed, the spring to hold the rod up, the swinging lever N, bearing on the rod to press it down, and the rotating shaft with cam-track to operate the lever N, and a swinging arm for said stock, whereby the fingers are brought to position over the match-blocks, substantially as herein described.

12. In a machine for wrapping block-matches, the means for twisting the projecting end of the paper down upon the match-blocks, consisting of the rotating stock, the set of fingers pivoted in its lower end and having toothed heads, the spring encircling said fingers, whereby they are held open and closed,

and the vertically-movable rod in said stock having teeth engaging the toothed heads of the fingers, whereby they are spread and closed, the spring to hold the rod up, the swinging lever N, bearing on the rod to press it down, and the rotating shaft with cam-track to operate the lever N, substantially as herein described.

13. In a machine for wrapping block-matches, and in combination with the series of traveling and rotating match-block holders, the means for twisting the projecting end of the paper down upon the blocks, consisting of the set of swinging fingers, the stock carrying said fingers, the swinging arm carrying the stock, the fixed rack, the pinion on the stock engaging the rack for rotating said stock, the power-shaft C, having the cam-grooves and the link connected with the swinging arm and operated by the cam-groove for swinging the arm and causing the stock and fingers to meet and to accompany the traveling blocks, the movable rod in the stock engaging the fingers for spreading and closing them, the spring for holding the rod up, the pivoted lever N, carried by the link for pressing the rod down, and the cam-track on the power-shaft for operating the lever, substantially as herein described.

14. In a machine for wrapping block-matches, the revolving holder-carrying wheel for effecting the travel of the match-blocks, in combination with the movable gravity-plunger for pressing the paper down upon the blocks and the means for operating said plunger, consisting of the lever having the tappet, the rotating shaft deriving power from the holder-carrying wheel, and the cam of said shaft operating under the tappet of the lever, substantially as herein described.

In witness whereof we have hereunto set our hands.

GEORGE GRISEL.
FRANK SEVERIO.

Witnesses:

S. H. NOURSE,
H. F. ASCHECK.