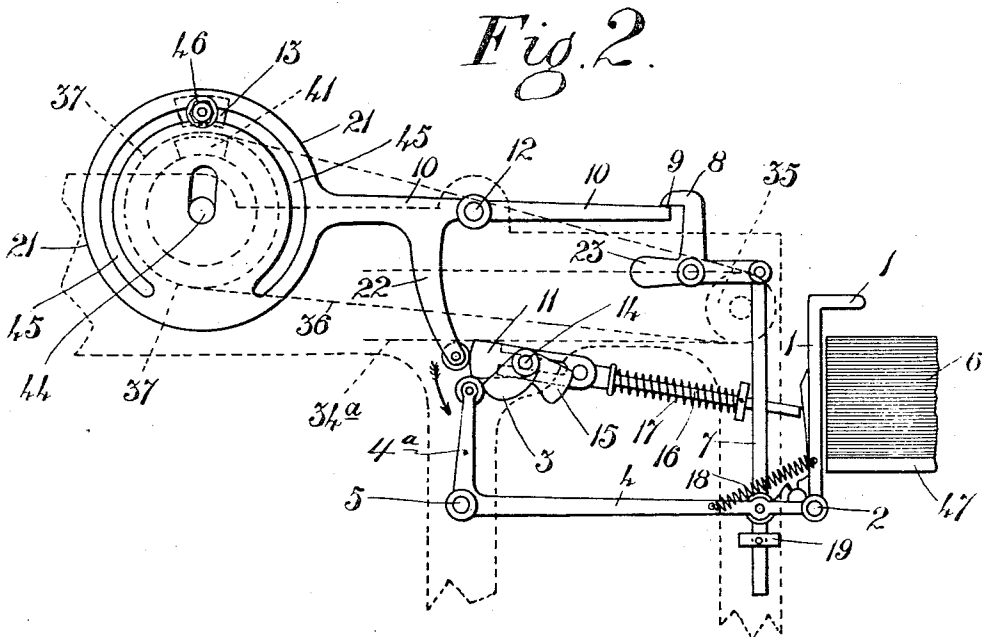
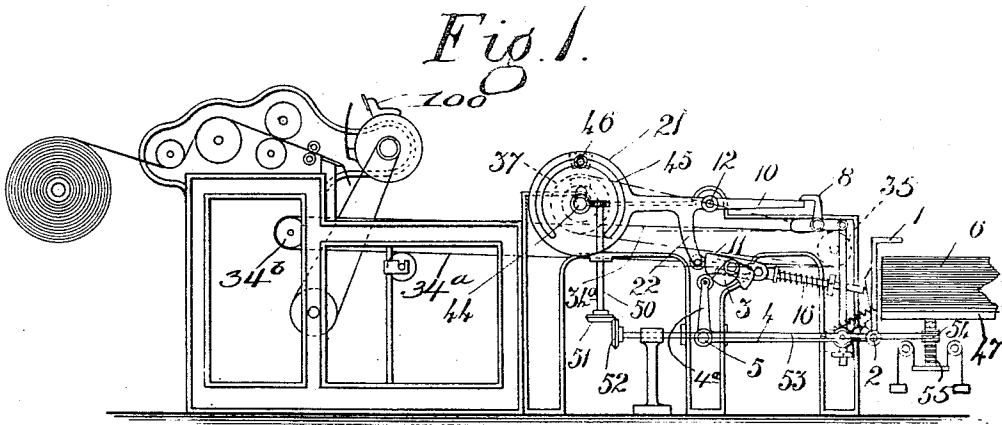


F. W. VICKERY,
LAYING MACHINE.
APPLICATION FILED AUG. 24, 1911.

1,144,268.

Patented June 22, 1915.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

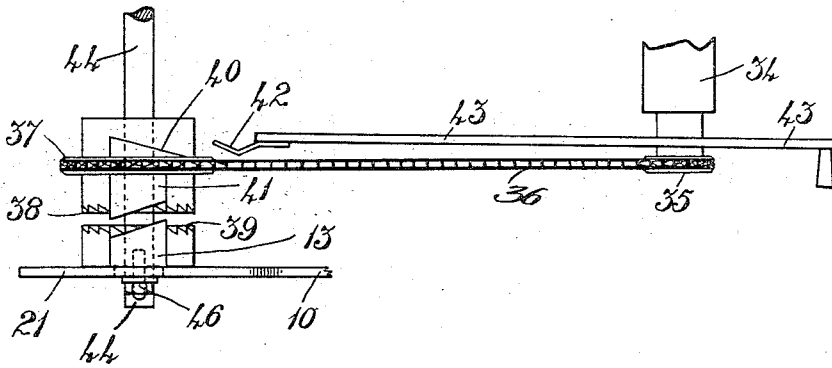
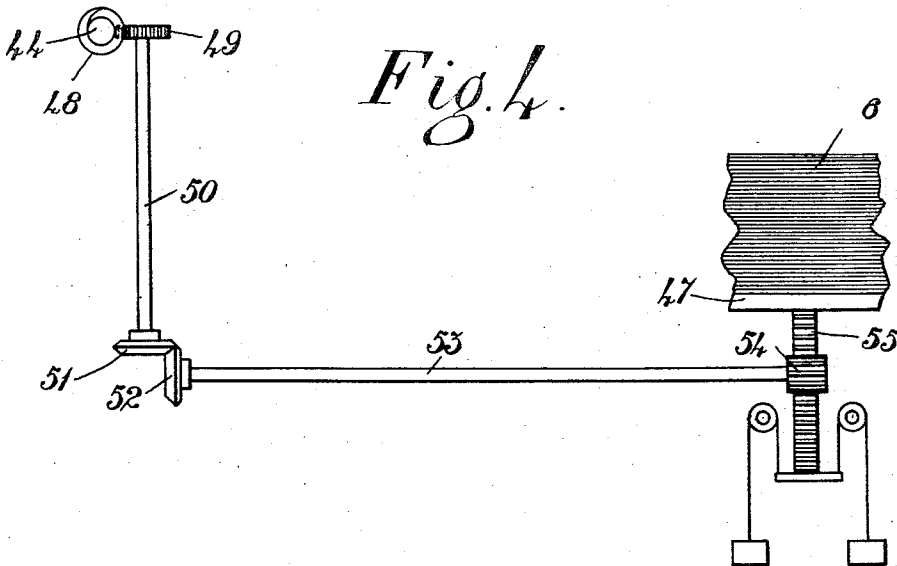


Fig. 4.



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UNITED STATES PATENT OFFICE.

FREDERICK WILLIAM VICKERY, OF LONDON, ENGLAND.

LAYING-MACHINE.

1,144,268.

Specification of Letters Patent.

Patented June 22, 1915.

Application filed August 24, 1911. Serial No. 645,724.

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM VICKERY, a subject of the King of Great Britain, residing at London, England, have
 5 invented certain new and useful Improvements in Laying-Machines, of which the following is a specification.

The present invention relates to that class
 10 of apparatus used with paper cutting machines in which the paper, after being cut, is carried in sheet form along on a band to a board or receiver whereon the sheets are piled up, and in which either the apparatus
 15 is raised or the paper receiving board is lowered automatically, to keep the pile of paper in normal position with regard to the delivery band, tapes, or mechanism of the machine.

The invention comprehends improved
 20 mechanism for pressing down the sheets of paper as they are fed, without it being necessary to perform such operation in relative time with the entrance of each sheet, as is now the case, this mechanism being utiliz-
 25 able, also, to straighten out the sheets, and the invention further comprehends an improved raising or lowering gear which is controlled by the pressing device according to the relative positions of the apparatus and
 30 the pile of paper.

An embodiment of the invention is illustrated in the annexed drawings, wherein:—

Figure 1 is a side elevation of an ordinary paper cutting machine having the invention
 35 applied thereto; Fig 2 is an enlarged side elevation of the mechanism employed for pressing the sheets down upon the pile and for straightening them at the same time, and regulating the raising or lowering mecha-
 40 nism; Fig 3 is a plan view of the mechanism for determining the rate at which the receptacle shall ascend or descend or the apparatus ascend or descend; Fig 4 is a diagram illustrating a form of mechanism suit-
 45 able for lowering the paper receiving board or table but also applicable for raising the apparatus or the paper conveying belt.

The sheet-pressing mechanism preferably consists of a plurality of hooks or levers 1,
 50 (see Fig. 2), which are designed to move toward and from the pile 6 and, also, to rise and fall. These hooks are approximately eight inches long, and are attached to a rod or other pivot 2 that is connected at oppo-
 55 site ends to a pair of levers 4, the latter being pivoted to a horizontal rock shaft 3

which is mounted in the frame of the machine and is operated by means of a cam or other actuator 3. In the construction shown, said cam engages a vertical arm 4^a which
 60 constitutes an extension of one of the levers 4, and thereby rocks the same counter-clockwise, with the result that the rod 2 and its hooks will be raised. The entire mechanism is free to drop by the action of gravity, and
 65 just before or at the time of falling the hooks are moved toward the pile, this movement being produced through the agency of a rod 16 which is controlled by a spring 17 and is
 70 operated by a cam 15 mounted on the shaft 14 to which the cam 3 is attached. In their raised position, said hooks are at or about the same level as the conveyer belt 34^a, hereinafter referred to, and when said hooks are
 75 lowered they engage the edge of the top sheet and pull it down upon the pile, at the same time permitting succeeding sheets to come over the top. The hooks are returned to normal position by means of the
 80 spring 18

The mechanism for conveying the sheets
 of paper to the pile generally consists of a driven roller 34, Fig. 3, around which is
 85 passed the afore-mentioned conveyer belt 34^a, said belt passing at its other end around a roller 34^b. The receiving end of this belt is located beneath a cutting appliance 100,
 90 so that as the web is severed thereby each sheet falls upon the belt and travels along with it to be deposited upon the pile of
 95 paper 6; or the sheets of paper may be otherwise fed to the conveyer belt 34^a. The relative position between the top of the pile and the conveyer is always substantially the same. To insure this, the hooks 1, or some
 100 part of their actuating mechanism or other equivalent are connected to the lowering or raising gear in such a way that the travel of the hooks, on being arrested by their en-
 105 gaging the pile, causes or allows the lowering or raising gear to be actuated.

In the following description, the apparatus will be described as effecting the lowering of the table 47 which carries the pile
 110 of sheets, but it must be understood that instead, the roller 34 and conveyer belt 34^a, or other operating appliances may be raised, the gear being set accordingly, in which case the table 47 would be a fixture. A convenient way is as follows:—Across one of
 115 the levers 4 with which the hooks 1 are connected extends a vertical rod 7 which is

pivoted at its upper end to the horizontal arm of a bell-crank lever 6, the vertical arm of the latter being formed as a catch or latch. This catch normally holds one end 9 of a lever 10, included in the lowering gear, into operative position, the lever being fulcrumed at 12 in the apparatus. When the hooks 1 are lowered, if their travel is not arrested before they arrive at a predetermined position, a collar 19 on rod 7 is struck by the adjacent lever 4, with the result that the catch 8 is rocked and disengaged from the lever end 9, whereupon lever 10 rocks by gravity in a counter-clockwise direction, a cam 11 on the shaft 14 coacting with a depending arm 22 on said lever 10 to return the latter to operative position every revolution before the hooks drop.

Assuming that the parts above referred to are in the positions shown in Fig. 2, the operation of so much of the apparatus as has been described is substantially as follows: The hooks 1 have been positioned over the pile by means of the cam 15 and the rod 16, and the arm 4^a is just about to be freed from the cam 3, to permit said hooks to be lowered onto the pile, the lever 10 being held up by the engagement of its arm 22 with the cam 11 and by the action of the catch 8. The shaft 14 moves counter-clockwise (Fig. 2), and the levers 4 with the hooks 1 will be released, the latter falling by gravity, and should said hooks rest upon the pile of paper before the lever engages the collar 19, the catch 8 will not be operated, it being kept in place with the rod 7 by means of its balance weight 23, thus indicating that the position of the pile with relation to the apparatus is correct; but should the pile of paper 6 not be high enough, the lever 4 will engage the collar 19 and pull down the rod 7, thus releasing the catch 8 from the end 9 of the lever 10 so that when the cam 11 releases the arm 22 the opposite end 21 will drop into inoperative position. The continued travel of the shaft 14 will then result in the release of rod 16, which latter is returned by the spring 17, and the hooks 1 by the spring 18, ready to be again raised, their raising being effected when the cam 3 again acts upon the end of the lever 4. The rod 7 and catch are then returned to normal position by the balance weight 23, so as to be ready for the engagement of said catch with the end 9 of the lever 10, which is effected when the cam 11 lifts that lever 10 to the position shown.

To enable the receptacle to descend at the exact speed required, the mechanism shown in Fig. 3 is preferably provided. To some part of the moving mechanism, say, the felt or conveyer driving roller 34, is affixed a toothed wheel 35 which is connected by a chain 36 with a sprocket 37 loose on the shaft 44 of the lowering gear, one side 38 of

such sprocket wheel 37 being formed as a clutch element which, when moved in one direction, connects with the clutch element 39 fixed to shaft 44. The chain or other drive 36 connected with this sprocket 37 is preferably run at an acute angle to shaft 44, so that its normal tendency is to keep the clutch element in said sprocket out of engagement with the fixed clutch element 39, although the sprocket is continually revolving. On opposite sides of the said sprocket are incline cam pieces 40 and 41, the cam 40 on the side away from the clutch being constructed to impinge against a cam piece 42 on a rod 43 which is movable to engage the cam 40 when required. The cam piece 42, when in operative position, at every revolution, forces the loose sprocket 37 into gear with the fixed clutch element 39, and thus gives motion to the descending gear connected through the shaft 44, the said cam piece 42 being preferably made with a spring action, so that if at the time the sprocket is thrown over, the jaws of the clutch do not coincide, the spring will give until such time as the clutch jaws properly engage each other, when the fixed clutch element will start to rotate. Cam piece 42 is preferably attached to rod 43, so that whenever the stopping of the action of the automatic descending gear is desired, it can be moved out of the path of the cam 40 on the loose sprocket, and consequently the latter will not be forced into clutch. On the clutch side of the sprocket 37, the cam 41 is designed to impinge against a cam 13 which is held in adjusted position in a slot 45 in the end 21 of the lever 10, (shown in Fig. 2), by means of a set-screw 46, this cam 13 forcing sprocket 37 out of clutch when such cam 13 is in position for the cam 41 to strike it. The action is as follows:—The sprocket 37 is thrown into clutch with the fixed element 39 at a given time, but the cam 13 for throwing the sprocket out of clutch is adjustable as to its position, with the result that if the mechanism is descending too quickly, or too great a distance at one time, the cam 13 can be moved so that it will engage cam 41 earlier; in other words, the extent of drive obtained each revolution is determined by the period of time the sprocket is allowed to remain in clutch. Now it will be seen that the spring cam 42, when in action, is always in one fixed position, and by determining the position of the cam 13 with regard to this cam 42, the extent of travel of the two clutch elements 38 and 39 together may be regulated; that is to say, suppose the cam 13 is positioned just behind the cam 42, the clutch element 38 on sprocket 37 will have been placed in action with the fixed clutch element 39 as soon as the cam 41 leaves the cam 13, and thus a greater part of one revolution of the shaft 44 will have

been effected; but should the cam 13 be placed farther away from the cam 42, the two clutch elements will be engaged for a shorter period, since after the clutch element 38 has been moved for the clutch element 39, the element 38 will have to travel some distance before the cam 40 will again engage the cam 42 to reengage the clutch elements, and when the cams 13, 41, 40 and 42 aline the cams 13 and 41 are touching and in consequence the shaft 44 is not revolved, because the clutch elements do not engage during the revolution of the sprocket 37. When the cam 11 lifts the lever 10 and the catch 8 does not retain the end 9 of said lever, the latter falls on removal of the cam 11, and during this lifting the cam 13 is acted upon by the cam 41 so that no action is imparted to the lowering gear. By this invention it is not necessary to "time" the mechanism to come into operation at any particular time relative to the travel of the sheet.

Any suitable mechanism may be employed for lowering the paper receiving table 47 carrying the pile of paper 6 when the conveyer roller 34 is stationary, or for raising the roller 34 with its conveyor belt 34^a and operating appliances when the table 47 is fixed; but for the sake of clearness there is shown in Fig. 4 a system by which the table 47 can be lowered while the conveyer roller 34 is fixed, such appliances, however, forming no part of the present invention. In this construction, there is secured upon the shaft 44 a worm 48 in mesh with a pinion 49 carried by a vertical shaft 50, the latter having at its lower end a bevel pinion 51 which meshes with a bevel pinion 52 on a horizontal shaft 53. This shaft 53 carries a pinion 54 in mesh with a depending rack 55 secured to the bottom of the table 47, so that on the movement of the shaft 44, as before stated, the table will be lowered through the mechanism just described. The worm 48 will prevent the table 47 from lowering by itself, but any suitable additional means may be applied for this purpose.

As shown in Fig. 2, the various parts are in position for normal working; that is to say, the hooks 1 are just about to be freed from the action of the cam 3, so that they can fall by gravity on the pile 6, the clutch elements 38 and 39 being in engagement, and the cams 13, 41 being out of engagement, so that a continuous lowering of the table 47 is effected. While this continuous lowering of the table 47 is being performed, the cam 11 does not actuate the lever 10, the latter being held by the catch 8, but should, however, the lowering of the table 47 be too quick for the feed of the sheets of paper from the belt 34^a, (such as when sheets of thin paper are being fed), the top of the pile 6 will become too low for the hooks 1

to rest upon before the lever 4 engages the collar 19 to move down the rod 7 and actuate the catch 8 to release the lever 10. When this occurs, the end 21 of the lever 10 will drop and thereby dispose the cam 13 in position for coaction with the cam 41, so that an intermittent lowering of the table is thus effected, and the reduction of speed of lowering of the table quickly regulating the table so as to bring the top of the pile 6 to the proper height for the hooks to rest upon after being lowered, and when this has occurred, the catch 8 will engage the end 9 of the lever 10 to remove the cams 13 and 41 out of action and effect a continuous movement of the table 47.

I claim:—

1. In a laying machine, the combination, with a sheet-receiving element and means for delivering the sheets thereto; of pressing mechanism cooperative with the pile of sheets on said receiving element embodying a series of sheet-engaging members, a rod to which said members are connected at their lower ends, a pair of parallel levers to which said rod is pivotally connected at its ends, one of said levers having an extension, a cam arranged to engage said extension for moving said rod and members above the pile, spring means for normally holding said members away from the pile, and cam-operated means for moving said members toward said pile against the action of said spring means.

2. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a clutch member, a cooperative clutch member fixed to said shaft, a cam carried by said driving element, and a movable rod provided with a terminal spring cam cooperative with the first-named cam for shifting said driving element along said shaft, to engage the two clutch members together.

3. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a clutch member, a cooperative clutch member fixed to said shaft, a cam carried by said driving element, means for shifting said driving element along said shaft, to engage the two clutch members together, and means cooperative with said cam for subsequently moving said driving element away from said fixed clutch member, to disengage the two clutch members.

4. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of

said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a clutch member, a cooperative clutch member fixed to said shaft, a cam carried by said driving element, means for shifting said driving element along said shaft, to engage the two clutch members together, and a member associated with the fixed clutch member and provided with a cam cooperative with the first-named cam for subsequently moving said driving element away from said fixed clutch member, to disengage the two clutch members.

5. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a clutch member, a cooperative clutch member fixed to said shaft, a cam carried by said driving element, means for shifting said driving element along said shaft, to engage the two clutch members together, and a slotted member associated with the fixed clutch member and provided with a cam adjustably mounted in the slot therein and cooperative with the first-named cam for subsequently moving said driving element away from said fixed clutch member, to disengage the two clutch members.

6. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a clutch member, a cooperative clutch member fixed to said shaft, a cam carried by said driving element, means for shifting said driving element along said shaft, to engage the two clutch members together, a rocking member associated with the fixed clutch member and provided with a cam cooperative with the first-named cam, for subsequently shifting said driving element away from said fixed clutch member, to disengage the two clutch members, and means for rocking the last-named member, to bring its cam into operative position.

7. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a clutch member, a cooperative clutch member fixed to said shaft, a cam carried by said driving element, means for shifting said driving element along said shaft to engage the two clutch members together, a rocking member associated with the fixed clutch member and provided with a slot, and with a cam adjustably mounted

in said slot and cooperative with the first-named cam, for subsequently shifting said driving element away from said fixed clutch member, to disengage the two clutch members, and means for rocking the last-named member, to bring its cam into operative position.

8. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a clutch member, a cooperative clutch member fixed to said shaft, a cam carried by said driving element, means for shifting said driving element along said shaft, to engage the two clutch members together, a rocking lever provided with a cam cooperative with the first-named cam, for subsequently shifting said driving element away from the fixed clutch member, to disengage the two clutch members, means for normally holding said lever with its cam in inoperative position, and means for releasing said holding means.

9. In a laying mechanism, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted thereon and provided with a pair of cams disposed upon its opposite sides and with a clutch member on one side, a cooperative clutch member fixed to said shaft, a cam cooperative with one of the first-named cams for shifting the driving element along said shaft toward the fixed clutch member to engage the two clutch members, and a cam cooperative with the other first-named cam for shifting said driving element away from said fixed clutch member to disengage the two clutch members.

10. In a laying machine, the combination, with a movable sheet-supporting element; of mechanism for controlling the movement of said supporting element comprising a shaft connected therewith, a driving element loosely mounted on said shaft and provided with a pair of cams upon its opposite side and with a clutch member on one side, a cooperative clutch member fixed to said shaft, an endwise movable rod provided with a terminal cam cooperative with one of the first-named cams for shifting said driving element along said shaft toward said fixed clutch member to engage the two clutch members, and a member provided with a cam cooperative with the other first-named cam for shifting said driving element away from said fixed clutch member to disengage the two clutch members.

11. In a laying machine, the combination, with a movable sheet-receiving element and

means for delivering the sheets thereto; of pressing mechanism coöperative with the pile of sheets on said receiving element embodying a series of sheet-engaging members, 5 a rod to which said members are connected at their lower ends, a pair of parallel levers to which said rod is pivotally connected at its ends, one of said levers having an extension, a cam arranged to engage said extension for moving said rod and members above 10 the pile, spring means for normally holding said members away from the pile, cam-operated means for moving said members toward said pile against the action of said spring means; mechanism for controlling 15 the movement of said sheet-receiving element including a rocking controlling member, and means for normally holding same in inoperative position; and means associated with said pressing mechanism for 20 automatically releasing said holding means.

12. In a laying machine, the combination, with a movable sheet-receiving element and means for delivering the sheets thereto; of 25 pressing mechanism coöperative with the pile of sheets on said receiving element embodying a series of sheet-engaging members, a rod to which said members are connected at their lower ends, a pair of parallel levers 30 to which said rod is pivotally connected at its ends, one of said levers having an extension, a cam arranged to engage said extension for moving said rod and members above the pile, spring means for normally holding 35 said members above the pile, spring means

for normally holding said members away from the pile, cam-operated means for moving said members toward said pile against the action of said spring means; mechanism 40 for controlling the movement of said sheet-receiving element including a rocking controlling member, and a catch normally engaged with said controlling member for holding same in inoperative position; and 45 means associated with said pressing mechanism for automatically releasing said catch.

13. In a laying machine, the combination, with a movable sheet-supporting element, and mechanism for pressing down upon the pile of sheets thereon; of mechanism for 50 controlling the movement of said supporting element embodying a rocking controlling member, a pivoted catch normally engaged with said member for holding same in inoperative position, and a vertical rod connected at its upper end to said catch and 55 provided adjacent its lower end with a collar; and means associated with said pressing mechanism and adapted for engagement with said collar, to lower said rod and thereby release said catch from said holding 60 means.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FREDERICK WILLIAM VICKERY.

Witnesses:

C. H. ZEH,
B. B. LOCKE.