

No. 658,812.

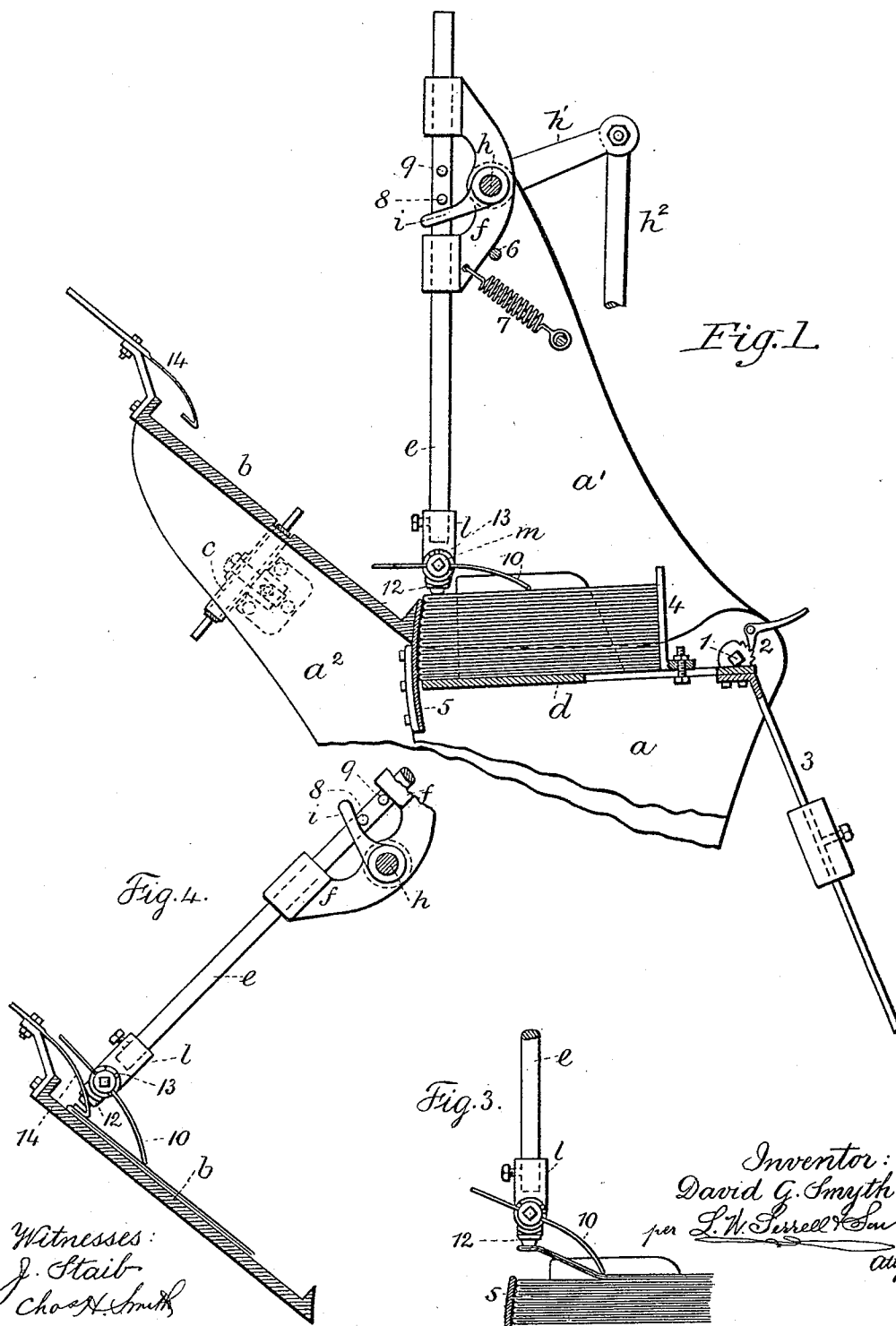
Patented Oct. 2, 1900.

D. G. SMYTH.
SHEET OR SIGNATURE GATHERING MACHINE.

(Application filed Oct. 4, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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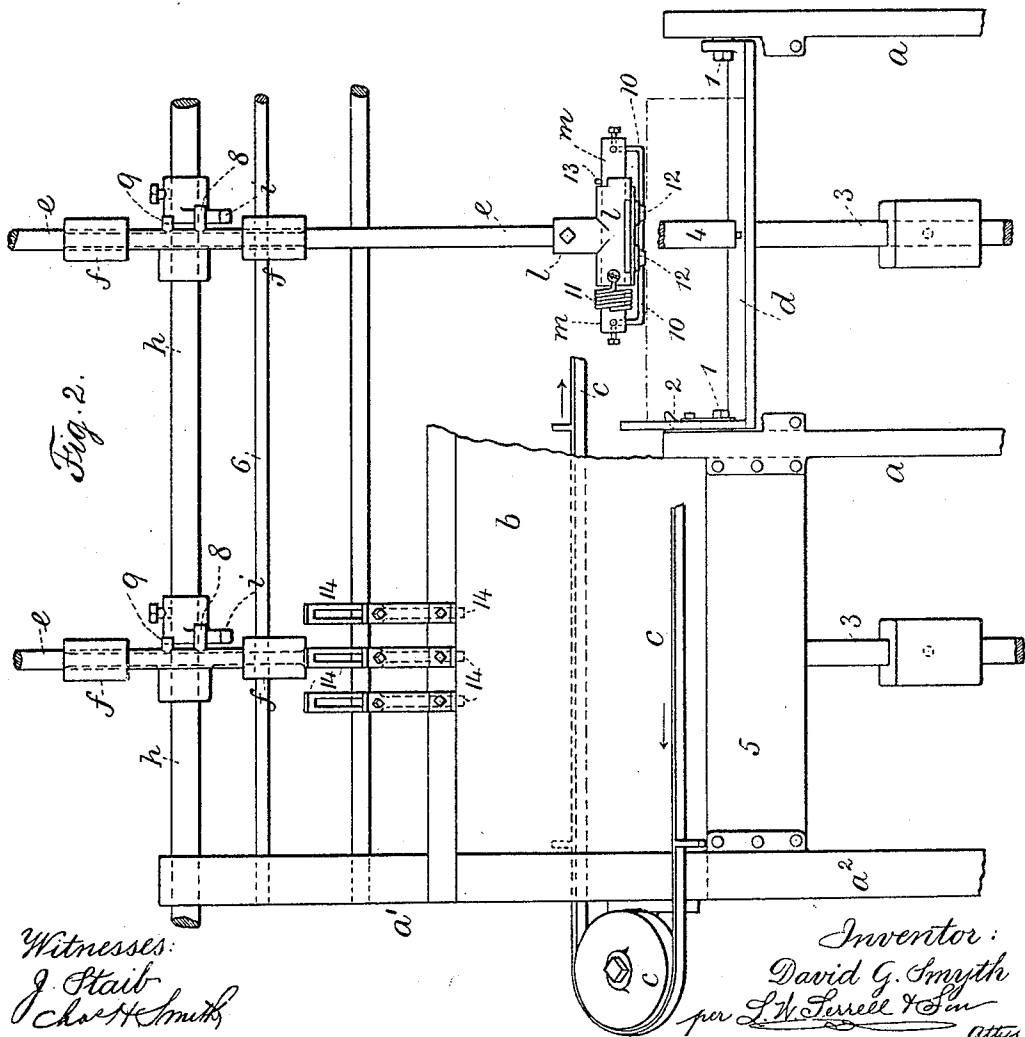
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

DAVID G. SMYTH, OF HARTFORD, CONNECTICUT.

SHEET OR SIGNATURE GATHERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 658,812, dated October 2, 1900.

Application filed October 4, 1899. Serial No. 732,463. (No model.)

To all whom it may concern:

Be it known that I, DAVID G. SMYTH, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Sheet or Signature Gathering Machines, of which the following is a specification.

My invention relates to new and novel means for raising one sheet or signature at a time from a pile of sheets, moving the same forward, and delivering it upon a conveyer onto which the sheets or signatures are assembled in the proper order. The devices employed are alike for each pile of sheets or signatures.

In carrying out my invention I employ a swinging table for supporting the pile of superposed sheets or signatures, and I employ devices for engaging the advancing end of each sheet or signature and momentarily holding down the rear portion of the same while the advancing portion is raised. I also employ devices for raising the sheet or signature bodily and swinging the same forward clear of the pile of superposed sheets or signatures above the conveyer and means for stripping the sheet or signature from the devices that have raised and moved the same forward and delivering the sheet or signature on a conveyer.

In the drawings, Figure 1 is an elevation and partial vertical section representing my improvements in the normal position. Fig. 2 is a front elevation and partial section of the parts shown in Fig. 1. Fig. 3 is a detached view showing the advancing end of the sheet or signature as raised from the pile of sheets or signatures, and Fig. 4 is an elevation representing the parts conveying the sheet or signature as having moved forward into the position where the sheet or signature is detached.

The parts illustrated in the drawings are alike for each pile of sheets. I have only illustrated the parts with reference to one pile of signatures, and I have only represented the parts for moving a sheet or signature at a time, the other parts of the machine being well known and forming no part of my present invention.

The frame of the machine is composed of

the intermediate portions *a*, that are alike, and the end portions, including the upward extension *a'* and the outward extension or bracket *a''*, only one end being shown. The bracket *a''* supports the inclined shelf *b*, the lower edge of which is upturned, and *c* represents a part of a conveyer of usual construction for gathering the sheets or signatures and conveying the same away.

A swinging table *d* is pivoted at 1 in the frame *a*, and at the pivot a pawl device 2 is provided, and attached to the table *d* is an inclined arm 3, with an adjustable weight. Upon the table *d* is an adjustable guide 4, and an apron 5 of curved contour is secured to the frame *a* forward of the free end of the table *d*, the pile of superposed sheets or signatures being upon the table *d* between the guide 4 and the apron 5. The pawl device 2 allows the table *d* to swing by the action of the weight upon the arm 3, so as to raise the superposed pile of signatures or sheets as the number thereon is reduced; but this pawl device prevents the table moving in the opposite direction. This opposite movement is effected by hand by the release of the pawl device. A normally-vertical bar *e* passes through yoke-bearings *f*, and a shaft *h* in suitable bearings upon the upward extension *a'* of the frame carries the yoke-bearings *f*, and upon this shaft *h* there is secured an arm *i*. The arm *i* is securely fastened to the shaft, while the yoke-bearings *f* are loose upon the shaft. A stop 6 on the frame extension *a'* limits the downward movement of the yoke-bearings *f*, and the spring 7, fastened to this frame extension *a'* and to the yoke-bearings *f*, draws the same against the stop, so as to bring the bar *e* into a vertical position. The bar *e* is provided between the yoke-bearings with studs 8 and 9. A tubular cross-head *l* is provided with a socket receiving the lower end of the bar *e*, the cross-head being clamped to the bar. Passing through this cross-head is a shaft *m*, and a wire frame 10 has its free ends passing through the shaft *m* near its respective ends and clamped thereto by ordinary bolts, and around the shaft *m* is a spring 11, one end of which is fastened to the shaft *m* and the other end to the cross-head *l*, and I provide a pin 13, projecting from the shaft *m* and moving through a slot in the cross-

head *l*, to limit the swinging movement of the shaft *m*.

On the base or under side of the tubular cross-head is a divided pad 12, preferably having a surface of gelatin or other suitable adhesive material; and I provide adjustable spring stripping-fingers 14 on the distant edge of the inclined shelf *b*, so placed that the fingers come between and outside of the gelatin-pads 12 when the tubular cross-head bears the relation to the said fingers shown in Fig. 4.

In the operation of the parts the weighted pivoted table *d* substantially balances the pile of superposed sheets and maintains the uppermost sheet or signature against the under surface of the pad 12, so that the same adheres to the pad. At the same time the rear end of the wire frame 10 bears upon the sheet or signature. The shaft *h* may be operated and the arm *i* swung by a crank-arm *h'* and rod *h''* from any suitable source of power. In the swinging of the shaft *h* the arm *i* strikes the stud 8 and raises the bar *e* till the stud 9 strikes the uppermost of the yoke-bearings *f* and simultaneously raises the advancing end of the sheet or signature, separating the same from the sheet or signature beneath. This position is shown in Fig. 3, and in starting the sheet or signature in this manner I overcome the suction action between the respective sheets or signatures of the pile. The pawl device 2 prevents the bar *e* pushing down the pile of sheets and the pivoted table *d*. The further movement of the shaft *h* and arm *i* swings the yoke-bearings *f* and the bar *e* forward into the position shown in Fig. 4 and with such movement carries along the sheet or signature adhering to the pad 12. At the end of the movement in this direction the spring stripping-fingers 14 pass between and at each side of the pad 12, bearing against the upper surface of the sheet or signature, and so stripping the same from the adhesive pad, the sheet or signature falling upon the inclined shelf *b* and upon the conveyer *c*, which moves the same along. The reverse movement of the shaft allows the spring 7 to act to draw back the bar *e* and the yoke-bearings with the movement of the shaft, so that the bar *e* is not lowered until it assumes a vertical position, where the yoke-bearings come against the stop 6, and the further movement of the shaft *h* and the arm *i* allows the bar *e* to descend and again bring the surface of the gelatin pad 12 against the uppermost sheet or signature and the wire frame 10 in contact therewith ready to repeat the operations just described. As this wire frame 10 is yielding, because of the action of the spring 11 in relation to the shaft *m*, the frame assumes the position shown in Fig. 1 when the surface of the pad 12 is upon the sheets, and when the advancing edge of the sheet or signature is raised the wire frame still holds the rearward portion of the sheet down upon the pile of sheets or signatures,

as shown in Fig. 3. I have shown a simple band conveyer *c* and wheel or roller around which the same passes as a means for moving the sheets or signatures deposited thereon; but I do not limit myself in connection with the present devices to any form of conveyer nor to any form of adjustable spring stripping-fingers 14.

I claim as my invention—

1. In a sheet and signature gathering machine the combination with the frame and a shield, of a swinging table for supporting the superposed pile of sheets or signatures, a pivot therefor and a pawl device adjacent to the pivot to prevent the backward movement, an arm connected to the table and an adjustable weight for maintaining the swinging table and for raising the same as the sheets or signatures are removed and an adjustable guide upon the table coming adjacent to the back edge of the superposed sheets or signatures, substantially as set forth.

2. In a sheet or signature gathering machine the combination with means for supporting a superposed pile of sheets or signatures, of means for engaging the sheet or signature adjacent to the advancing edge, means for momentarily holding down the rear portion of the sheet or signature and for simultaneously raising the advancing edge and thereafter releasing the holding-down device, means for thereafter swinging the sheet or signature forward, and means for removing and delivering the sheets or signatures to a conveyer, substantially as set forth.

3. In a sheet or signature gathering machine, the combination with means for supporting a superposed pile of sheets or signatures, of means for engaging the sheet or signature adjacent to the advancing edge, means for momentarily holding down the rear portion of the sheet or signature and for simultaneously raising the advancing edge and thereafter releasing the holding-down device, means for thereafter swinging the sheet or signature forward, and means for removing and delivering the sheets or signatures to a conveyer, and a means for returning the afore-said devices to a normal position preparatory to repeating the operations, substantially as set forth.

4. In a sheet and signature gathering machine, the combination with the frame *a*, of a curved guide 5, a table *d* pivoted to the frame and provided with an adjustable guide 4, a pawl device 2 at the pivot of the table for holding the table against the return movement, an inclined arm 3 and adjustable weight for balancing the weight of the pile of signatures and raising the same as the signatures or sheets are removed, substantially as set forth.

5. In a sheet and signature gathering machine the combination with devices for supporting a superposed pile of sheets or signatures, of a tubular cross-head, a pad on the under side of the same of adhesive material,

a shaft passing through the cross-head, a spring around the shaft connected thereto and to the cross-head, a pin in the shaft and a slot in the cross-head to limit the movement

5 of the shaft and a wire frame connected adjustably to the said shaft and a means for raising and lowering the cross-head substantially as and for the purposes set forth.

6. In a sheet and signature gathering machine the combination with the frame and a shaft having a movement first in one direction and then in the reverse direction, of an arm fixed upon the shaft, a yoke bearing loosely upon the shaft adjacent to said arm,

15 a vertically-moving bar passing through the yoke-bearings, studs upon the shaft between the yoke-bearings and acted upon by the arm of the shaft, a stop upon the frame for limiting the movement of the yoke-bearings and

20 a spring for returning the yoke-bearings to a normal position and means upon the lower end of the bar for engaging a sheet or signature and elevating the same, substantially as set forth.

25 7. In a sheet and signature gathering machine, the combination with the frame and a shaft having a movement first in one direction and then in the reverse direction, of an arm fixed upon the shaft, a yoke bearing

30 loosely upon the shaft adjacent to said arm, a vertically-moving bar passing through the yoke-bearings, studs upon the shaft between the yoke-bearings and acted upon by the arm of the shaft, a stop upon the frame for limiting the movement of the yoke-bearings and

35 a spring for returning the yoke-bearings to a normal position and a tubular cross-head on the lower end of said bar, a divided gelatin pad upon the lower end of said cross-head, a spring-actuated shaft passing through

40 the cross-head and an adjustable wire frame carried by said shaft and a stop to limit the rotary movement of said shaft, substantially as set forth.

45 8. In a sheet and signature gathering machine, the combination with a frame and a

shaft having a movement first in one direction and then in the reverse direction, of an arm fixed upon the shaft, a yoke bearing loosely upon the shaft adjacent to said arm, 50 a vertically-moving bar passing through the yoke-bearings, studs upon the shaft between the yoke-bearings and acted upon by the arm of the shaft, a stop upon the frame for limiting the movement of the yoke-bearings and 55 a spring for returning the yoke-bearings to a normal position and a tubular cross-head on the lower end of said bar, a divided gelatin pad upon the lower end of said cross-head, a spring-actuated shaft passing through 60 the cross-head and an adjustable wire frame carried by said shaft and a stop to limit the rotary movement of said shaft, and adjustable spring stripping-fingers adapted to come between and at each side of the pad in 65 the forward movement of the mechanism for stripping the sheets or signatures, from the pad, substantially as set forth.

9. In a sheet and signature gathering machine, the combination with the frame and a 70 shaft having a movement first in one direction and then in the reverse direction, of an arm fixed upon the shaft, a yoke bearing loosely upon the shaft adjacent to said arm, a vertically-moving bar passing through the 75 yoke-bearings, studs upon the shaft between the yoke-bearings and acted upon by the arm of the shaft, a stop upon the frame for limiting the movement of the yoke-bearings and a spring for returning the yoke-bearings to 80 a normal position, and a cross-head upon the lower end of the bar and a device on the under side of the same having a surface of adhesive material for engaging a sheet or signature and elevating the same, substantially 85 as specified.

Signed by me this 16th day of September, 1899.

DAVID G. SMYTH.

Witnesses:

F. W. KREIMENDAHL,
CHARLES A. SAFFORD.