2 Sheets—Sheet 1.

S. SCHOLFIELD.

PAPER FEEDING MACHINE.

No. 184,731 Patented Nov. 28, 1876.

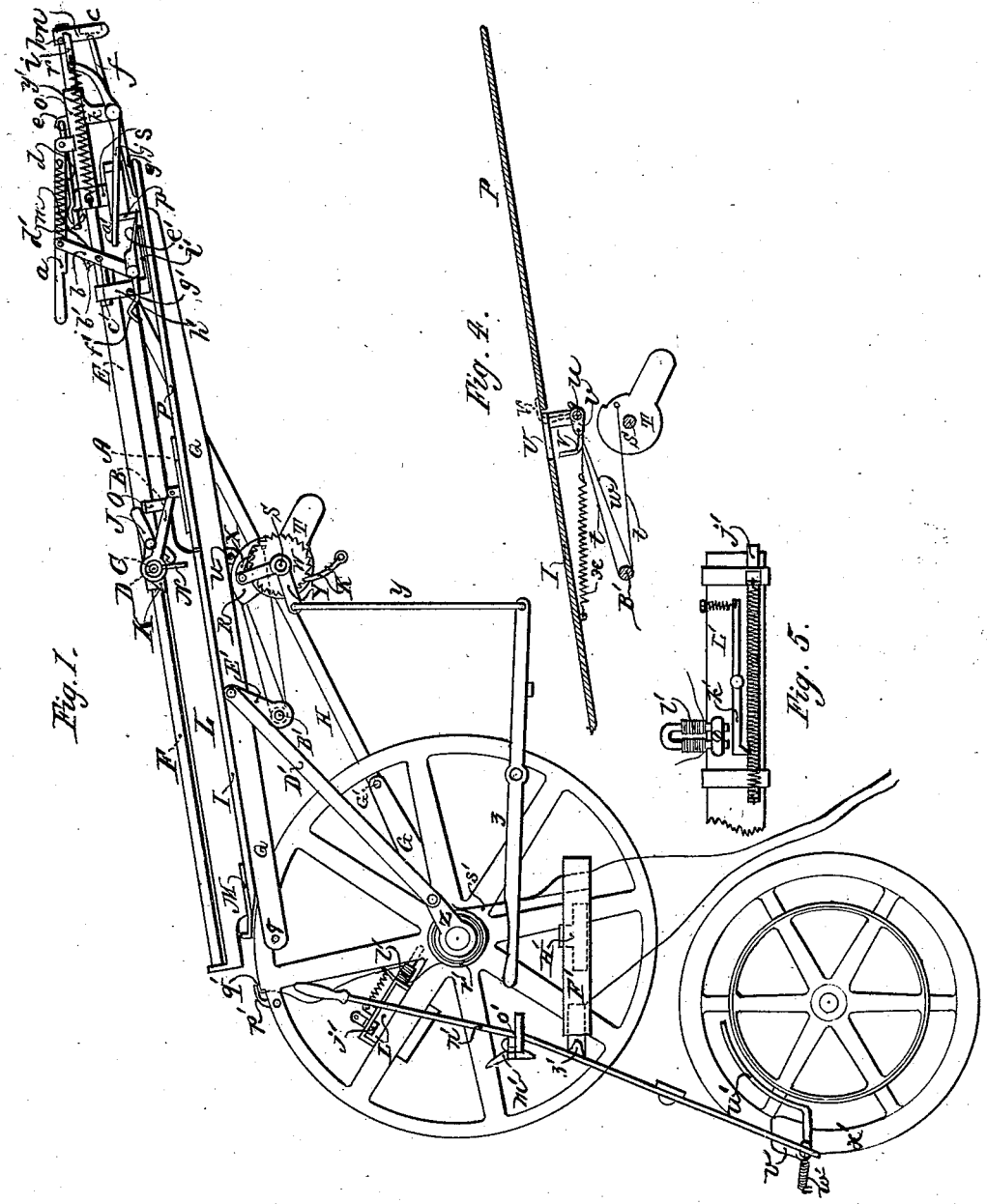

Fig. 1.

Fig. 4.

Fig. 5.

Witnesses.

Charles E. Baker

James McMurray

Socrates Scholfield.

2 Sheets—Sheet 2.

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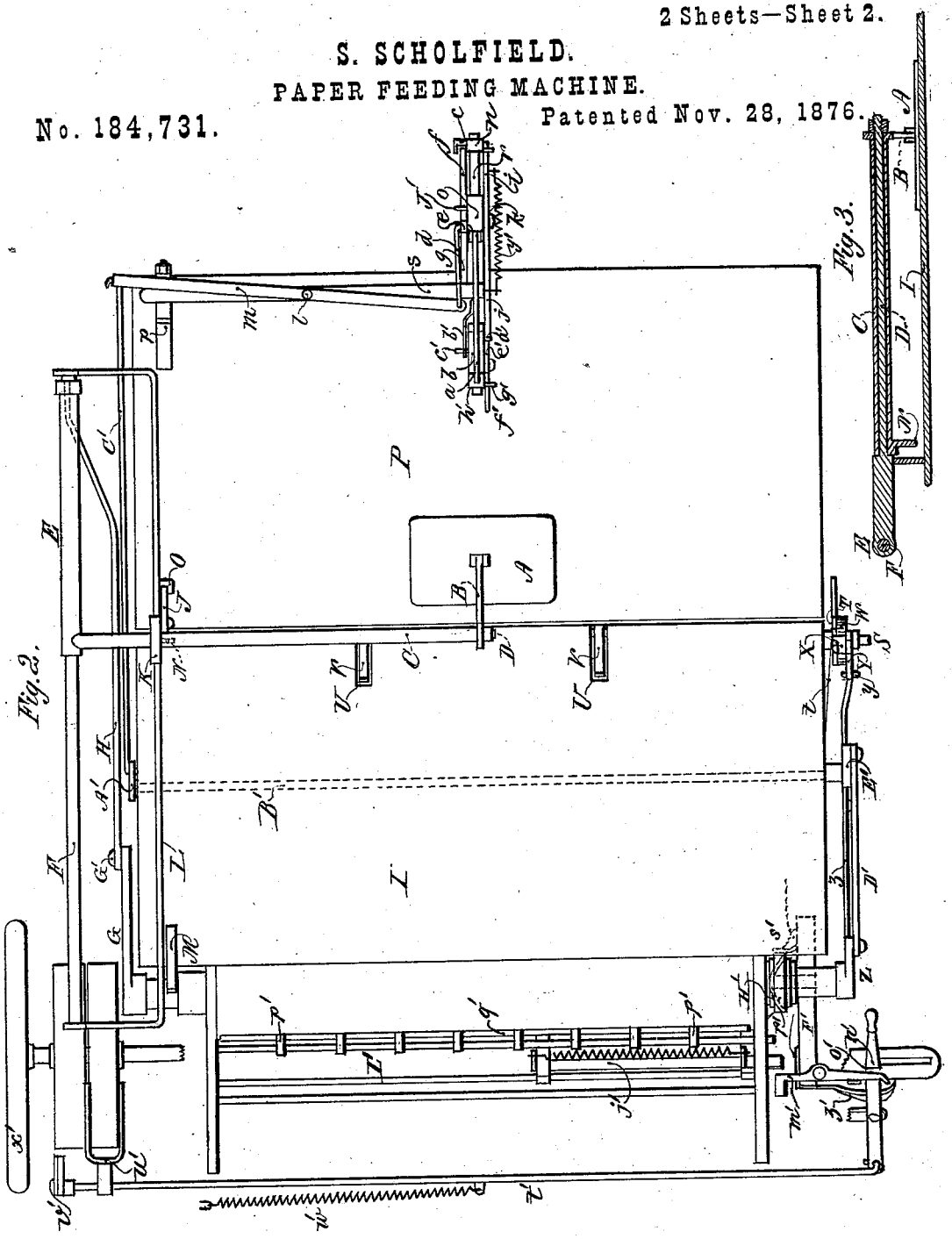

Fig. 2.

Fig. 3.

Witnesses.

Charles E. Baker

James McMurray

Socrates Scholfield

UNITED STATES PATENT OFFICE.

SOCRATES SCHOLFIELD, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO HIMSELF, CHARLES E. BAKER, OF MONT CLAIR, NEW JERSEY, AND CHARLES E. JOHNSON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PAPER-FEEDING MACHINES.

Specification forming part of Letters Patent No. **184,731**, dated November 28, 1876; application filed December 17, 1875.

To all whom it may concern:

Be it known that I, SOCRATES SCHOLFIELD, of Providence, in the State of Rhode Island, have invented an Improvement in Paper-Feeding Machines, of which the following is a specification:

The nature of my invention consists in a rubber friction-pad, pivoted to an arm projecting inward from one side of the machine, and arranged to move back and forth over the registering table or board. By thus operating the pad from one side of themachine only, the opposite side may be kept comparatively free from mechanism, and thus be readily accessible for all necessary purposes. My invention also includes an automatically-elevated feed-board, or pile-receiving table, controlled in its upward movement by one or more "feeling-arms," arranged to rise and fall through openings made in the registering-table, the forward movement of the feeling-arms being produced by means of a spring or weight. It also consists in a certain combination of devices for picking up the edge of the sheet and clamping the pile preparatory to the action of the pad, which serves to remove the sheet to the registering-table. It also consists in an improved magnetic stop-motion, and in the employment of a friction-brake in combination with the belt-shipper of a printing-press, for the purpose of checking the momentum, so that the machine will be brought to a full stop before the impression is reached.

Figure 1 represents a side view of the moving parts of a paper-feeding machine as attached to a cylinder printing-press. Fig. 2 represents a top view of the same. Figs. 3, 4, and 5 are detail drawings of certain parts.

In the drawings, A is a friction-pad, faced with india-rubber and pivoted to the arm B, which is rigidly attached to the tube C, held loosely upon the rod D. (Shown in section in Fig. 3.) The rod D is attached at right angles to the sleeve E, which is made to move back and forth upon the guide-rod F by means of the crank G and connecting-rod H.

The shoe K, fixed upon the rod D, moves back and forth upon the slide L, which serves to support the rod D and hold it parallel to the surface of the registering-table I. The pad A is held in an elevated position, when moving toward the pile, by means of the catch J, pivoted to the shoe K.

The stop O serves to raise the catch J, so as to allow the pad A to drop upon the pile of paper in order to withdraw the top sheet, and the stop M, which engages with the arm N, fixed upon the tube C, serves to raise the pad to its former position.

The pile-receiving table P is supported upon two arms, Q, pivoted at the point *q*, and resting upon two cams, R, fixed upon the shaft S, running from side to side of the machine. An up-and-down movement may thus be imparted to the table P by turning the shaft S. Upon the shaft S I also place the ordinary ratchet W and guard T, and connect the guard T to a feeling-arm, V, made to rise through an opening, U, in the registering-table, so that when the arm V strikes down upon the surface of the pile of paper, when the feed-table is at less than its proper elevation, the guard T will be drawn back, so as to uncover some of the teeth of the ratchet W to the action of the catch X, attached to the bell-crank lever Y, which is made to vibrate back and forth by means of the crank Z, the end of which strikes against the pivoted lever *z*, which is connected to the lever Y by means of the rod *y*.

The feeling-arm V is actuated in its forward movement by the spring *x*, and in its backward movement, so as to pass under the registering-table, by means of the flexible band *w*, attached to the arm *v* upon the shaft *u*, connection being also made from the arm *v* to the guard T by means of the band *t*, as shown in Fig. 4.

The rod *r* is attached at right angles to the bar *s*, pivoted to the stand *p*, which is to be adjustable on the table P, so that the same machine may be made to work paper of all the sizes required. The sleeve *o* is made to work back and forth upon the rod *r* by means of the lever *m*, pivoted to the bar *s* at the point *l*, connection being made to the crank A′ upon the rocking shaft B′ by means of the rod C′. Upon an arm, *k*, extending downward from

the sleeve *o*, is pivoted the cutter-arm *j*, the cutter *a'* being made to rise and fall by means of the cam *i* and pin *h*, while the sleeve *o* is being moved back and forth on the rod *r*. Upon the opposite side of the arm *k* is placed a pivoted lever having two arms, *f* and *g*, which may be made to rock by means of the attached side arm *e*, from the upper end of which connection is made to the lever *m* by means of the connecting-rod *d*. Upon one side of the arm *n*, projecting downward from the rod *r*, is placed the stop *c*, which serves, through the arm *f*, to control the up-and-down-movement of the arm *g*, employed for holding the pile while the top sheet is being removed by the action of the pad A. To the rod *r* is also pivoted the lever *b*, notched at its upper end to receive the latch *a*, pivoted to the sleeve *o*. To the latch *a* is attached the cam-arm *b'*, which, by striking the pin *c'*, causes the latch to rise, so as to release the lever *b*, in order that it may fly back to its normal position by the action of the spring *d'*. (Shown in Fig. 1.) To the lower end of the lever *b* is pivoted the picking-up pin *e'*, which is raised from the pile, after entering the hole made by the cutter *a'* in the top sheet, by means of the cam *f'* and pin *g'*, placed upon one side of the leg *h'*, at the bottom of which is attached the foot *i'*. The cutter *a'* is held down upon the paper, in order to make it cut properly, by means of the spring *y'*. A rocking movement is imparted to the shaft B' by means of the crank Z, connecting-rod D', and crank E', the crank E' being made longer than the crank Z. Upon the wooden strip L', clamped to the arms of the cylinder, is placed the sliding spring-bolt *j'*, held back by the catch *k'*. (Shown in Fig. 5.) The catch *k'* is drawn out of the notch in the bolt *j'* by means of the electro-magnet *l'*. Upon the frame of the machine is pivoted the cam-lever *m'*, which operates to throw the spring shipper-lever *n'* out of the retaining-notch *o'*, by which means the belt will be shifted from the fast to the loose pulley. The gripers *p' p'* are made to strike down upon the insulated metallic strip *q'*, from which electric connection is made to the magnet *l'*, from whence the current passes to the insulated ring *r'*, against which the insulated spring *s'* presses, in order that the current may flow thence back to the battery. The electric current passes into the machine through the insulated spring *z'*, against which the shipper-handle *n'* presses when it has been forced by hand into the notch *o'*. Thus, whenever the machine is stopped, the shipper-lever *n'* will fly away from contact with the spring *z'*, so as to disconnect the battery and prevent accidental waste. To the rod *t'*, to which the belt-fork *u'* is attached, is also attached the friction-pad *v'*, which is pressed, by the spring *w'*, against the side of the balance-wheel *x'*, thus checking the momentum of the machine before the impression is reached whenever the shipper-lever *n'* has been released by the action of the stop-motion. The sliding bolt *j'* is thrown back, after being released to stop the machine, by means of the cam H, attached to the bar F'.

The operation of the machine will be as follows: After drawing back the pawl K', which serves to prevent the shaft S from turning back under the action of the weight of the receiving-table and its supported pile of paper acting upon the inclined surface of the cams R, the receiving-table may be lowered by means of a hand-wheel to be attached to the projecting end of the shaft S. The pile of paper is then to be placed upon the table and properly adjusted, the mechanism for picking up the top sheet and then clamping the pile having been raised out of the way for this purpose. The table is then to be adjusted so as to bring the top of the pile to the proper elevation, in which position it will be held by the pawl K'. The picking-up mechanism is then to be let down upon the paper, so that the foot *i'* may rest upon the top of the pile. Upon starting the machine, by throwing the shipper-lever into the notch *o'* a rocking movement will be imparted to the shaft B' by means of the cranks Z and E' and connecting-rod D', and this vibratory motion will be imparted to the sleeve *o* upon the rod *r* by means of the crank A', connecting-rod C', lever *m*, and connecting-rod *d*, which is jointed to the arm *e*, attached to the arms *f* and *g*, pivoted to the arm *k* of the sleeve *o*. Now, whenever the lever *m* causes the arm *e* to move back, it will first move until it strikes against the stop J' without imparting motion to the sleeve *o;* but during this interval the arm *e*, being rigidly connected at right angles to the arms *f* and *g*, will cause the said arms to partake of the angular movement of the arm *e*. The arm *g* will thus be raised from the paper, which will allow the foot *i'* to drop to the pile and support the apparatus. The arm *f* will, at the same time, be thrown down, so that when the arm *e* strikes the stop J', thus causing motion to be imparted to the sleeve *o*, the arm *f* will pass immediately under the stop *c*, and the cam *i* will allow the cutter *a'* to come down to the paper and cut a slight hole through the top sheet, and when the lever *m* takes up a contrary movement the arm *e* will be prevented from striking forward by the arm *f* and stop *c*. The arm *g* will thus be held in an elevated position while the sleeve *o* is moving forward toward the pile. When the sleeve *o* starts to move forward, the latch *a* having caught in the end of the lever *b*, the picking-up pin *e'* will be thrown forward over the surface of the paper, and, entering the hole previously cut by the action of the cutter *a'*, will cause the edge of the sheet to be raised by the action of the cam *f'* and pin *g'*, so that the arm *g*, in its elevated position, will pass immediately under the edge of the top sheet and over the pile. As the motion of the sleeve *o* continues the action of the cam *b'* upon the pin *c'* will cause the latch *a* to be thrown out of catch

with the lever *b*, thus allowing the spring *d'* to draw the upper end of the lever *b*, so that the picking-up pin *e'* will be withdrawn by a sudden backward movement from the hole in the top sheet. At about this time the sleeve *o* will bring up against the end of the supporting-bar *m*, and the end of the arm *f* will pass out from under the stop *c*, and the continued motion of the lever *m* will then carry the arm *e* forward, raising the outer end of the arm *f* and lowering the outer end of the arm *g*, so that the arm *g* may first strike the top of the pile under the sheet previously picked up, and then a continued movement of the lever *m* will cause the arm *g* to raise the foot *i'* from the surface of the top sheet. The position of the several parts at this stage is shown in Fig. 1. In the meantime the pad A has been dropped to the top of the pile by the action of the stop O upon the pivoted catch J, and as soon as the pad A takes up a reverse movement through the action of the crank G and connecting-rod H the released sheet will be withdrawn from under the foot *i'*, the arm *g* effectually clamping the remaining sheets and preventing their removal, the weight of the whole apparatus being at this time supported by the arm *g*.

As soon as the sheet has been drawn out from under the foot *i'* the lever *m* will take up a reverse movement, causing the arm *e* to be again thrown back against the stop J', raising the arm *g* from the pile, and thus allowing the foot *i'* to sink thereon, and to hold the pile, while the operation of picking up a sheet is repeated, as before described.

The described combination of a cutter and a picking-up pin, when the cutter first rises from the pile to allow the pin to enter the hole so formed, has been previously patented by myself and Charles E. Baker; therefore I make no claim to this portion of the apparatus, separately.

When the pad has brought the sheet down to the proper point to be taken by the gripers of the printing-press to which the feeding-machine is attached, it is raised from the paper by means of the stop M, which engages with the arm N, projecting downward from the loosely-fitting tube C, to which the pad is attached. When the sheet of paper is being brought down to the gripers the feeling-arm V will rise through the opening U in the registering-table, and strike over toward the pile-receiving table, as shown by the dotted lines in Fig. 4; and if the table is not at the proper elevation, then the arm V will strike so far forward, through the action of the spring *x* upon the shaft *u*, to which the arm V is attached, that it will pull the weighted guard T so far back, by means of the connecting-band *t*, that a tooth of the ratchet-wheel W will be exposed to the action of the catch X. The wheel W will thus be turned until the table P is raised to the proper elevation, which is determined by the proper forward movement of the arm V.

In case the sheet is properly taken between the gripers *p' p'* and the insulated metallic strip *q'* there can be no electric circuit formed around the magnet *l'*, which serves to draw the catch *k'* out of the notch in the spring-bolt *j'*. The machine will therefore continue in action; but if the edge of the sheet is defective, or if the sheet is entirely wanting, then the current will pass from the positive pole of the battery, through the insulated spring *z'*, into the shipper-handle, and thence through the machine to the gripers *p' p'*. Thence passing into the strip *q'*, it is allowed to circulate around the magnet *l'*, and pass, by the way of the insulated ring *r'* and insulated spring *s'*, back, through a wire connected therewith, to the negative pole of the battery, and the electro-magnet *l'*, so formed, will pull the catch *k'* out of the notch, so as to allow the bolt *j'* to spring out, as shown in Fig. 1; and as the cylinder moves forward, the end of the bolt *j'* will strike against the end of the cam-lever *m'*, thus forcing the shipper-handle *n'* out of the retaining-notch *o'*. The spring *w'* will then throw the belt from the fast to the loose pulley, and bring the brake *v'* against the side of the balance-wheel *x'*, to check the momentum of the machine.

When the machine is again started, the bolt *j'*, by coming in contact with the cam H', attached to the bar F', will be forced back, so that it will be again retained by the spring-catch *k'*.

I claim as my invention—

1. The combination of the crank-pin G', connecting-rod H, sliding sleeve E, fixed arm D, tube C, arm B, pad A, and slide L.

2. The combination of the spring *x* and arm V, rising through the opening U in the registering-table, with the guard T, ratchet-wheel W, cams R, catch X, pawl K', cord *w*, and shafts *u* S.

3. The combination of the cutter *a'* and pin *e'* with the foot *i'*, sleeve *o*, arms *e*, *f*, and *g*, and stops *c* and J'.

4. The combination of the insulated metallic strip *q'* with the electro-magnet *l'* and the gripers *p' p'*.

5. The spring-bolt *j'*, spring-catch *k'*, and electro-magnet *l'*, arranged within the revolving cylinder, and combined with the cam-lever *m'* and spring-shipper *n'*.

SOCRATES SCHOLFIELD.

Witnesses:

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W. W. KINGSLEY.