(No Model.) 2 Sheets—Sheet 1.

C. SEYBOLD.

SIGNATURE PRESS.

No. 471,303. Patented Mar. 22, 1892.

Fig. 1.

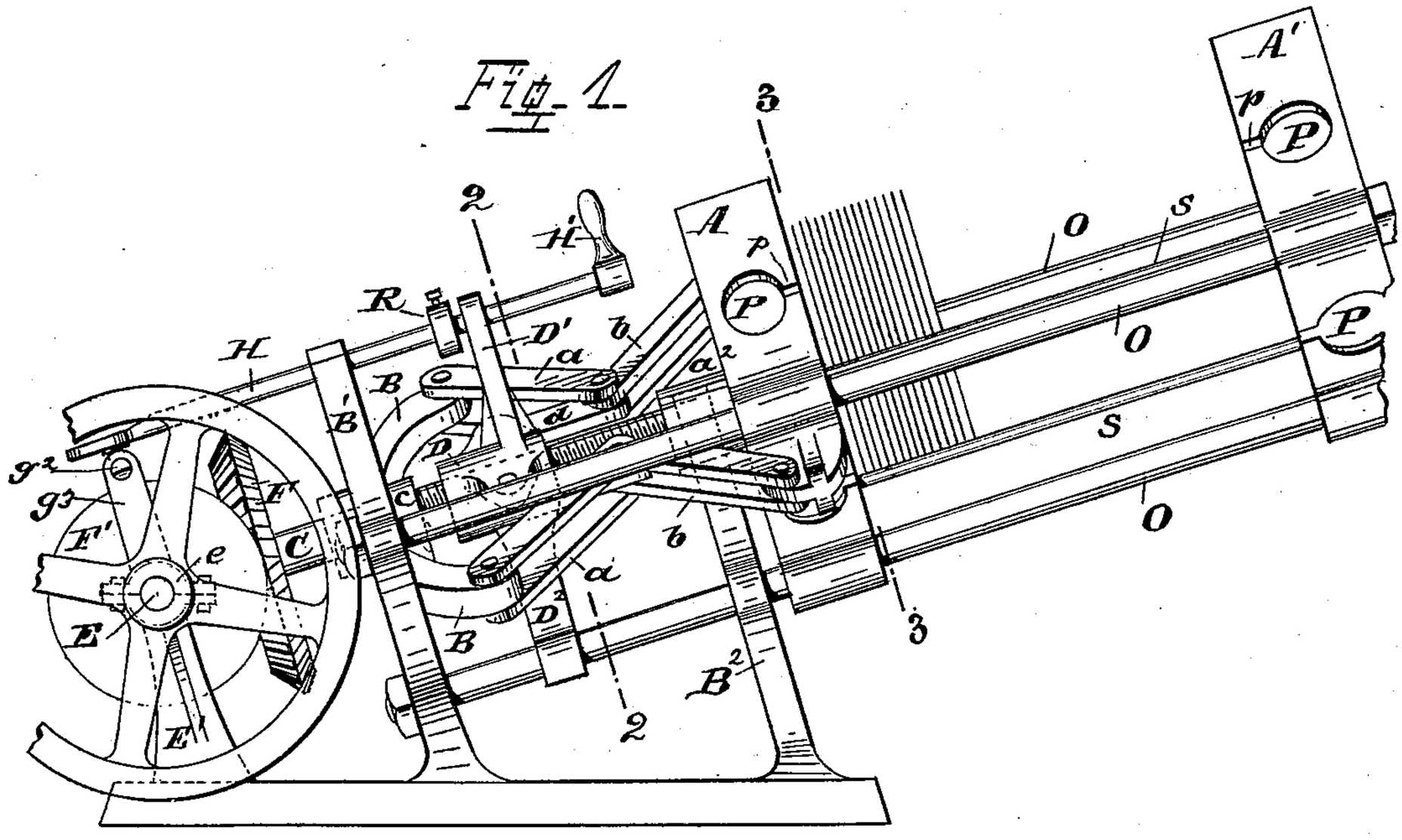


Fig. 2.

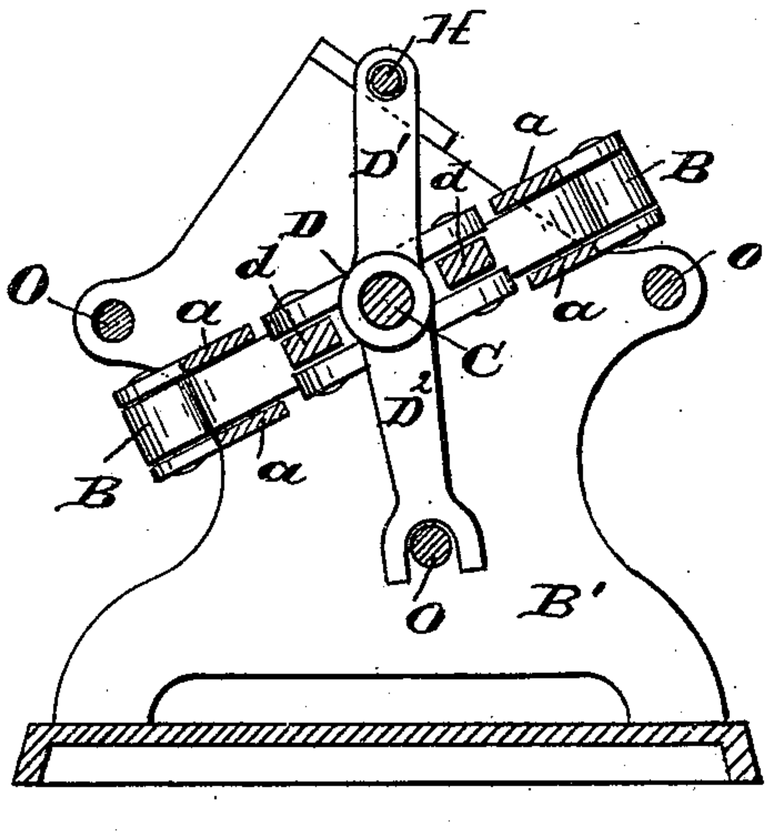
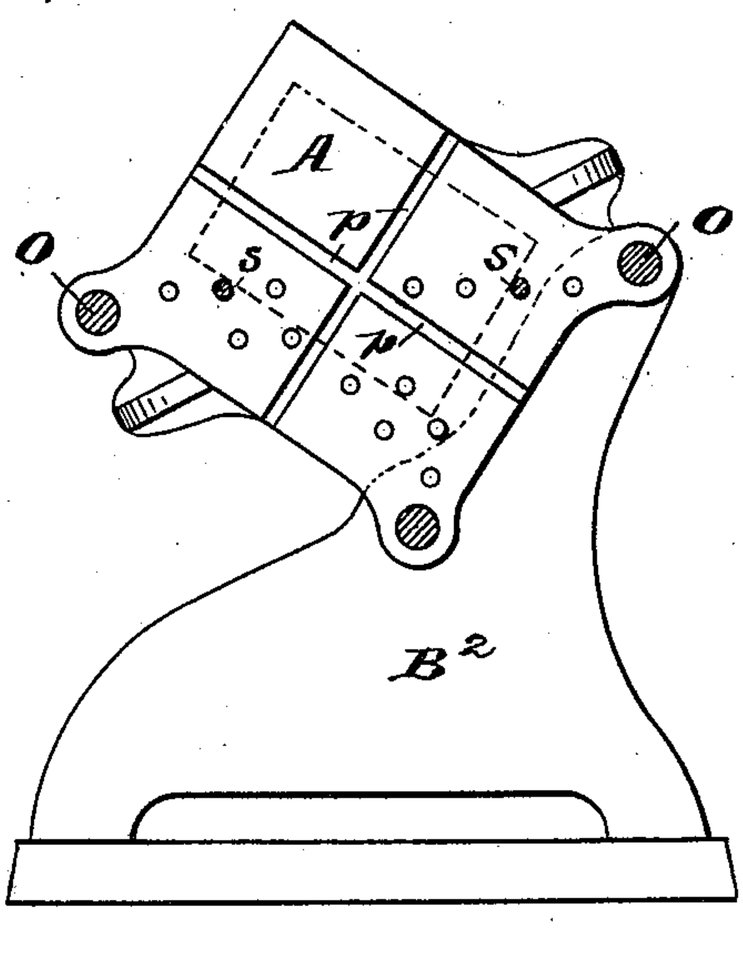


Fig. 3.



Attest
Harry F. Hoking
George Baeder

Inventor
Charles Seybold
per O. M. Hill Atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

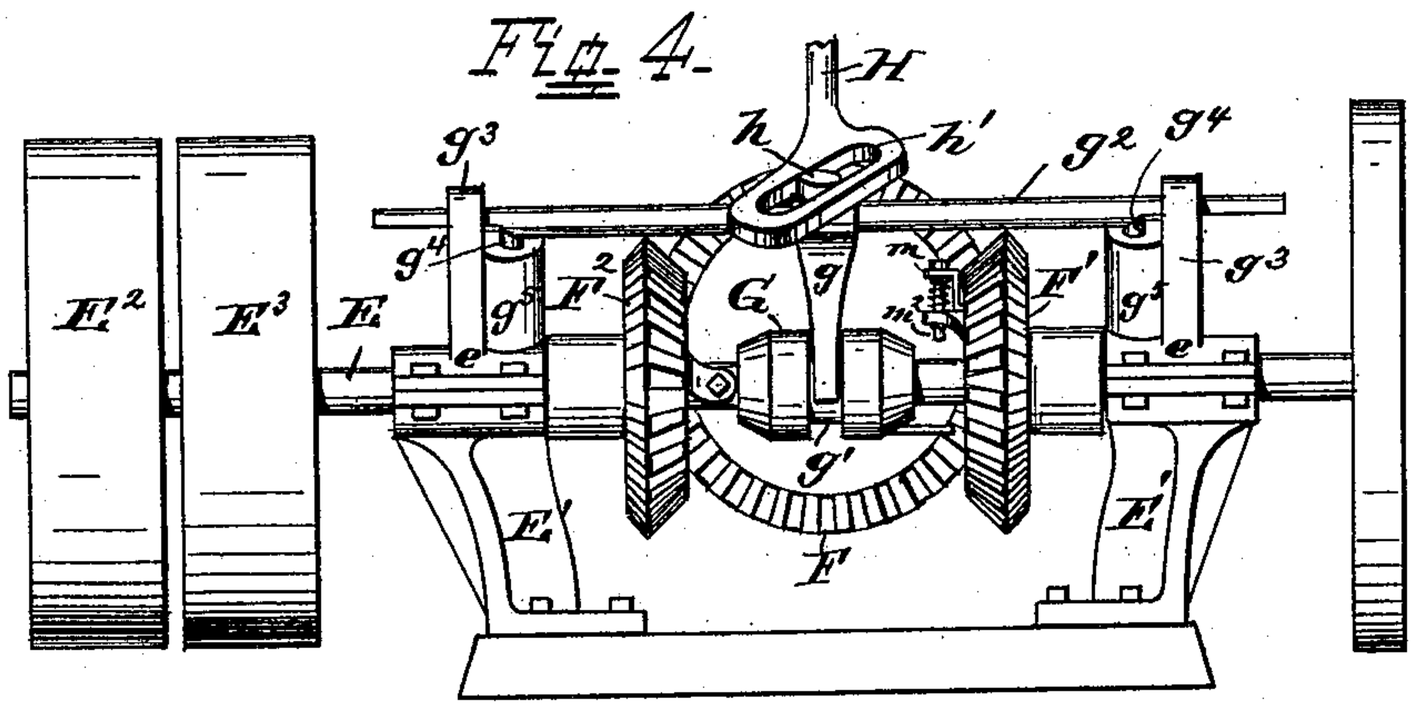


Fig. 5.

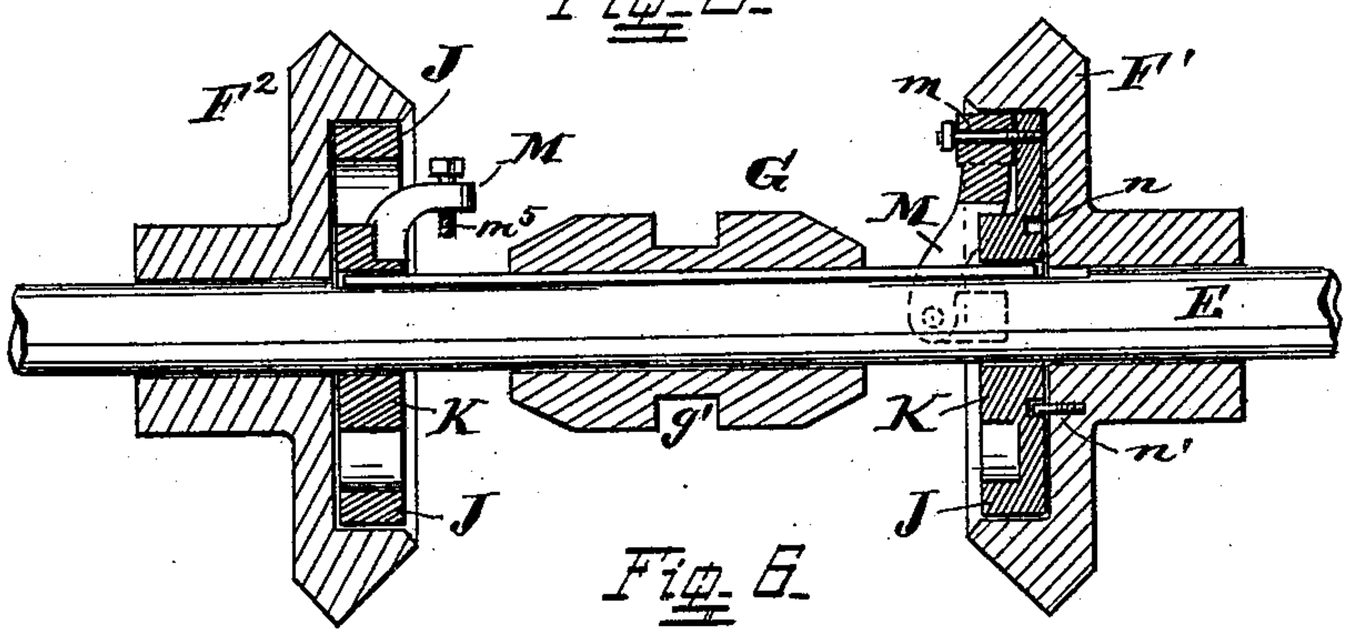


Fig. 6.

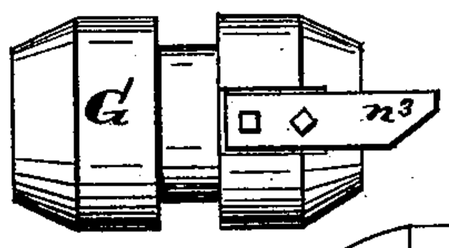


Fig. 7.

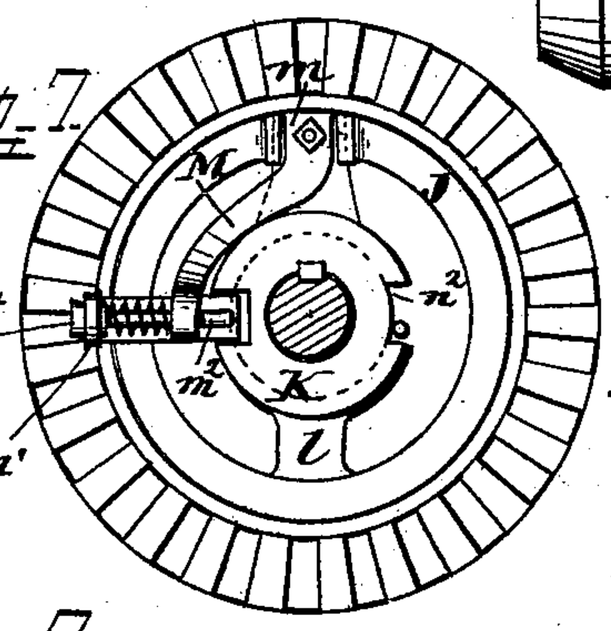


Fig. 10.

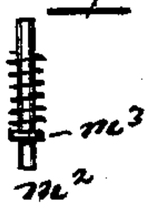


Fig. 8.

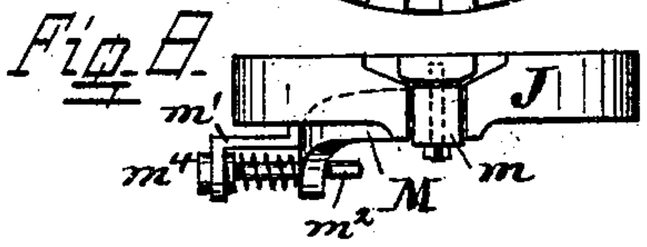
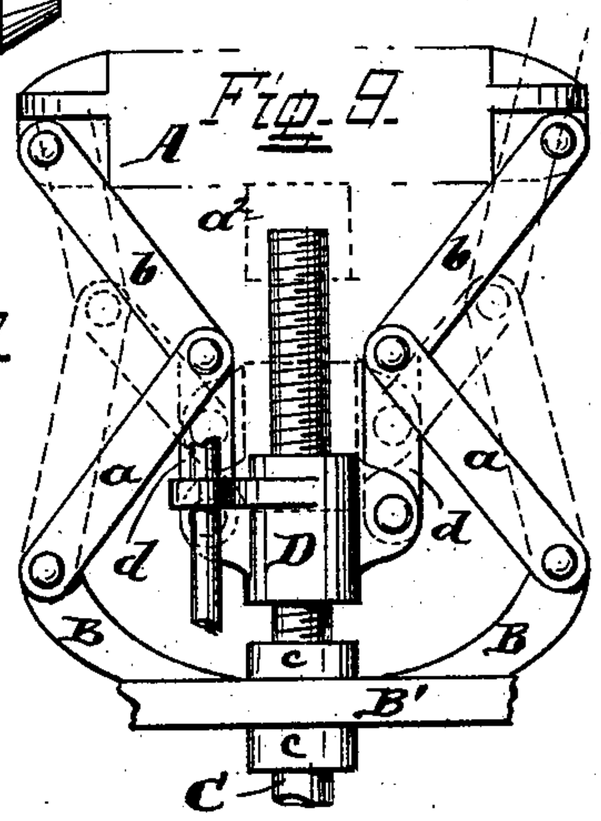


Fig. 9.



Attest
Harry L. Koking.
George Bacon

Inventor
Charles Seybold
per O.M. Hill atty.

UNITED STATES PATENT OFFICE.

CHARLES SEYBOLD, OF CINCINNATI, OHIO.

SIGNATURE-PRESS.

SPECIFICATION forming part of Letters Patent No. 471,303, dated March 22, 1892.

Application filed February 7, 1891. Serial No. 380,617. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SEYBOLD, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Signature-Presses, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The object of my invention is to produce a press for dry-pressing signatures or bundles of paper, either with or without the use of fuller-boards, which press will do the work more quickly and satisfactorily than the ordinary hydraulic presses now commonly used. This object I attain by means of the link or toggle connection between the sleeve on the driving-screw and the movable head, as will more fully hereinafter appear.

In the accompanying drawings, Figure 1 is a perspective view taken from one side of my improved press, the movable head being shown back almost to its extreme limit. Fig. 2 is a vertical cross-section taken on the line 2 2 of Fig. 1, looking toward the left hand in said Fig. 1. Fig. 3 is a vertical cross-section taken on the line 3 3 of Fig. 1, looking toward the left hand in said Fig. 1. Fig. 4 is a rear end view of the press shown in Fig. 1, showing the preferred mechanism for operating the pressure-screw in opposite directions, also preferred form of mechanism for starting and stopping the rotation of said screw, the latter operation being accomplished automatically. Fig. 5 is a horizontal section through the driving-gears, split bands within said gears, and the beveled clutch, showing the relative position of each on the driving-shaft when not in operation. Fig. 6 is a perspective view, detached, of the beveled clutch, showing the beveled pin or bar attached to one side thereof for automatically stopping the machine when a certain degree of pressure is attained, as will hereinafter appear. Fig. 7 is an inner or face view of the gear and split band therein shown at right hand in Fig. 5, with the preferred form of device attached thereto for regulating the degree of pressure requisite to automatically stop the pressure and the operation of the press. Fig. 8 is a side or edge view of the split band and mechanism for expanding same within the driving-gear shown in Figs. 5 and 7, said view being taken with said band removed or detached from the driving-shaft and its gear. Fig. 9 is a top view of the driving-screw, nut, and link connection between said nut and the stationary and movable head of the press, the dotted lines indicating the position of said link connection and nut when the movable head has been forced out to almost its extreme limit. Fig. 10 is a detached view of pin m^2 and its pressure-spring.

My invention consists, primarily, in the mechanism and means afforded for driving the movable head A, which consists of the compound toggle connection between said head and the stationary arms B, which connection is made up of arms *a* and *b*, pivoted, respectively, to said stationary arms B and head A at their outer ends and pivotally connected at their meeting ends, as shown in Figs. 1 and 9. Between the meeting ends of arms *a b* and on the same pivotal connection are pivoted the ends of the short arms *d d*, the other ends of said latter arms being pivotally connected to suitable extensions formed on the nut D, as more clearly shown in Fig. 9, said nut traveling on the driving-screw C as the latter is rotated.

My invention also consists, in connection with the aforementioned device for driving the head, of the means for alternately rotating the driving-screw in opposite directions from one and the same band-wheel without changing the motion of the main driving-shaft E. This mechanism consists of the gear or miter wheels F, F′, and F^2, beveled clutch G, bifurcated arm *g*, push-rod H, and split bands or pulleys J and their connecting mechanism for expanding said bands. The gear F is keyed to the rear end of screw C, (see Fig. 1,) which latter rests and rotates in a suitable bearing in the upright frame-support B′, the opposite end of said screw rotating in a socket a^2, centrally cast or otherwise connected to the movable head A. This screw C is retained in position longitudinally by means of the collars *c* at either side of the stationary frame-support B′, as shown. The gears F′ and F^2 are loosely connected to the shaft E and retained in position thereon

by means of the journal-bearings *e*, mounted on the frame-supports E′, as shown in Figs. 1 and 4. These gears F′ and F² mesh with gear F, as shown. The beveled clutch G and split bands or pulleys J J are connected to shaft E by means of a feather-and-groove connection, as shown in Fig. 5, by reason of which said clutch and bands constantly revolve in one direction with said shaft after power is applied thereto through the medium of band-pulley E³.

E² is a loose pulley arranged to operate in the usual manner.

The bifurcated arm *g* at its lower end portion rests in and partially encircles the groove *g′* in clutch G, the upper end of said arm being connected to the rod g^2, which latter rests and slides in the brackets g^3. This rod g^2 has a beveled or cut-away portion near each end, which forces the pins g^4 down within the case g^5, said pins being supported by a spring. (Not shown.) This arm *g* is also provided at top with a lug *h*, which latter rests in the elongated opening *h′* in the outer end of push-rod H, as shown in Fig. 4. The function of pins g^4 in connection with the beveled portions on rod g^2 is to retain said rod in position, in order that the clutch may be held in a central position between the gears F′ F², except when said rod is forced longitudinally in either direction.

The split bands J consist of two semicircular portions connected to a central hub K by means of the solid cast portion *l*, (see Fig. 7,) said semicircular portions resting within the inner countersunk face of gears F′ and F², as shown in Fig. 5. Between the meeting ends of the two semicircular portions comprising said frictions bands is pivoted a lever M, having a rectangular-shaped shank *m* between said meeting end portions, against which shank said portions constantly impinge, as shown in Figs. 7 and 8. To the outer end of this lever M is connected a bracket *m′*, a pin m^2 extending through the extension of said bracket and the end of lever M, as shown in Figs. 4, 7, and 8. This pin m^2 has a flange m^3 on it, as shown in Fig. 10, which flange rests in a countersunk portion in the top face of lever M. The upper end of pin m^2 enters the hollow nut m^4, which latter is screwed into a screw-threaded opening in the extension of bracket *m′*. A coiled spring or other elastic material is interposed between the flange m^3 and lower portion of nut m^4, which spring regulates the amount of pressure of pin m^2 on the face of clutch G, as will appear from the operation presently to be described.

The aforedescribed construction refers only to the clamp mechanism shown at right hand in Fig. 5 in connection with the gear which forces the movable head inward to compress the signatures of other bundles of paper. The gear F² has a similar split band J and hub K and lever M, but differs from the other mechanism aforedescribed in that the outer end of lever M has a set-screw m^5, which is positive in its action and is not controlled by any elastic pressure, as will presently appear.

Around the inner face of the hub K of the split band J (shown at right hand in Fig. 5) is an annular recess *n*, a stationary pin *n′* projecting from the inner face of gear F′ into said annular recess. This hub K has a recess n^2 extending from its outer face into the annular recess *n*, in which recess n^2 the beveled tongue n^3 (made fast to one end portion of clutch G) projects, when said clutch is thrown into contact with the pin m^2 in the manner presently to be described in connection with its operation.

The movable head A is supported and slides on the rods O, which latter pass through projections of the frame-supports B′ and B², as shown. To the outer ends of rods O is connected the stationary head A′, the heads A and A′ having cross intersecting grooves *p* in their outer faces, as shown in Fig. 3, which grooves lead to the enlarged cross intersecting openings P. (Shown in Fig. 1.) The purpose of these grooves *p* and openings P is to permit the operator to pass his hand into the openings P and pass the cord around the bundle after it is compressed, the cord passing through the recesses *p* and around the bundle.

If desired, suitable end boards (not shown) may be used to protect the ends of the bundle of signatures.

I do not lay any claim to the construction of these heads A A′; neither do I lay any claim to the process of tying the bundles herein set forth, as said process and construction of heads are old and well known in connection with baling-presses for various purposes.

The push and pull rod H slides in a bearing in the top of frame B′ and also in a bearing at the top of extension D′, the latter being connected with nut D. Said nut D also has a downward extension D², the lower bifurcated portion of which partially encircles one of the brace-rods O, as shown in Fig. 2. This latter projection serves to steady the nut as it travels back and forth on the screw-rod C.

To the rod H is secured a set-collar R, which is for the purpose of automatically stopping the operation of the movable head in its back-stroke after having compressed the bundle, as will appear from its operation hereinafter given.

In the head A are preferably a number of screw-threaded openings *s*, into which the supporting-rods S are screwed, the opposite ends of said rods passing into corresponding openings (not screw-threaded) in the face of the stationary head A′, which latter is hollow. This latter head is of sufficient thickness to accommodate the length of movement of the movable head A. The rods S are preferably three in number to form a V-shaped trough, into which the signatures or other bundles are placed before being compressed and tied.

Having described the several features of my invention and their location and construction, I will now describe the operation of the same. After having placed the desired number of signatures in position on the rods S, either with or without fuller-boards, the operator grasps the handle H′ on rod H and pushes said rod to the left in Fig. 1 toward the gear-operating mechanism, which operation causes the arm *g* (see Fig. 4) to slide with rod g^2, and with said arm the clutch G is moved toward the right hand in said Fig. 4, the beveled face of said clutch being forced beneath the pin m^2, which operation causes the outer free end of lever M to elevate slightly, which latter movement of said lever causes the free ends of band J to become expanded through the medium of the rectangular head *m* on said lever. The expansion of said split band J causes the latter to engage and impinge against the inner flanged face of gear F′ and imparts a rotary motion thereto, and the motion imparted to said gear is transmitted to the screw-rod C through the medium of gear F. So soon as the screw-rod begins to rotate in the proper direction the nut D begins to travel thereon toward the right hand, as shown in Fig. 1, and so soon as the nut begins to travel thereon the short arms *d d* force the connecting ends of arms *a b* outward toward a longitudinal plane, as shown by dotted lines in Fig. 9, and in this manner the head A is made to move on the rods O. It will be readily seen that this construction affords a compound toggle connection, which is very powerful, for operating the head. The degree of pressure on the bundle to be pressed is in the present illustrative instance governed by the tension of the spring or other elastic substance which encircles the pin m^2 and bears upon its annular flange m^3. As aforedescribed, this pin m^2 impinges against the beveled face of clutch G and also causes the two portions of band J to expand within the gear F′, and so soon as the pressure of the head overcomes the friction of the split band within the gear, which friction is regulated by the tension of the coiled spring bearing on collar m^3 on pin m^2, said band will slip within said gear until the pin n', which projects within the annular groove *n*, comes in contact with the beveled tongue n^3 on clutch G, at which time said clutch is forced away from the pin m^2 and the split band J assumes its normal position and the rotation of gear F′ is stopped. After the bundle has remained under pressure the requisite length of time and having securely tied said bundle the operator again grasps the handle H′ and pulls the rod toward the right hand in Fig. 1, which operation causes a reverse movement of arm *g* and clutch G, said vertical clutch engaging the screw m^5, which causes the lever M to expand the bands J in the manner aforedescribed, and thus impart a rotary motion to gear F^2, and any motion imparted to gear F^2 is transmitted to the screw-rod C through the medium of gear F, but in a direction opposite to that aforedescribed. This latter rotary motion of the screw-rod causes the nut D to recede until the upward projection D′ strikes the set-collar R on rod H, at which time said rod is forced backward until the clutch G is drawn away from the set-screw m^5, at which time the expanded friction-band J assumes its normal postion and the motion of gear F^2 is stopped.

If desired, an additional set-collar similar to collar R may be employed on the opposite side of the projecting arm D′ for automatically stopping the movement of the head while compressing the bundle; but if this latter means be employed the pressure will be stopped at a given distance without regard to the amount of pressure attained, and for this reason the means aforedescribed for stopping the movement of the head when a certain degree of pressure is attained is preferred.

The degree of pressure required to cause the split bands J to slip in gear F′ is governed by the tension of the spring on collar m^3, and this may be increased or diminished by means of the nut m^4, which bears against said spring.

The advantages of my improved press are many and will be apparent to those having occasion to use such a press. In the first place I am enabled to accumulate as much pressure as can be had by the use of any of the ordinary hydraulic presses now in use and the space occupied is considerably less. A second and very valuable feature is that by reason of the compound toggle connection between the movable head and the traveling nut I am enabled to move the head rapidly at the start when great pressure is not required; but as the pressure is increased the movement of the head is decreased, and the nearer the arms *a b* approach a longitudinal plane the less perceptible will be the movement of the head. In the reverse movement the head very slowly recedes from the bundle at start, but gradually increases until the movement becomes very rapid at the *finis*.

The means afforded for automatically stopping the movement of the head according to a certain determined degree of pressure is another valuable feature of my invention, as well as the feature of rotating the pressure-screw in opposite directions from one and the same driving-pulley without changing the rotation of the latter.

Still another great advantage which I attain by the use of the means herein set forth for driving the movable head is that as the pressure increases the friction decreases and the nearer the toggle-arms *a b* approach a longitudinal plane the less power will be required to drive the traveling nut on the screw-rod and the greater will be the pressure attained.

What I claim as new, and desire to secure by Letters Patent, is—

1. A power-press having a stationary head and a movable head, in combination with

suitable operative mechanism for operating said movable head and for automatically stopping the movement of the latter in one direction at a determinate degree of pressure thereon, for the purposes set forth.

2. In a power-press having a stationary and a movable head, the screw-rod having a nut adapted to travel thereon, and a toggle connection between said nut and movable head, and suitable means for alternately imparting motion to said screw-rod in opposite directions, in combination with connecting automatic mechanism for stopping the rotation of said screw-rod at a determinate degree of pressure on the movable head, for the purposes specified.

3. In a power-press, the screw-rod C, nut D, traveling thereon, toggle-arms *a*, *b*, and *d*, movable head A, and the downward bifurcated extension D^2, said toggle-arms being pivotally connected to stationary parts of the press, nut, and movable head, as set forth, the bifurcated portion D^2 being connected to said nut and partially encircling one of the stay-rods, and suitable means for operating said screw-rod, for the purposes specified.

4. In a power-press having a movable head adapted to be operated by a toggle connection between said head and a nut traveling on a screw-rod, as set forth, the gears F, F′, and F^2, and suitable clutch mechanism for alternately imparting motion to said gears F′ and F^2, for the purposes specified.

5. In a power-press having a movable head adapted to be operated by screw-rod, nut, and toggle connection, as set forth, the means herein set forth for operating the clutch G, the same consisting of rod H, having an oblique elongated opening h' at its lower end portion, and arm *g*, connected to sliding rod g^2, said arm having a projection *h* entering said opening h', the lower bifurcated portion of said arm partially encircling said clutch, said rod H having a set-collar R, for the purposes set forth.

6. In a power-press having a movable head adapted to be operated by a toggle connection, as set forth, the gears F, F′, and F^2, clutch G, split band J, located within gear F^2, said band having a lever M pivoted between the meeting ends of said band, with a set-screw m^5 in the outer free end of said lever, and suitable means for operating and sliding said clutch, for the purposes set forth.

7. In a power-press having a movable head adapted to be operated by a screw, nut, and toggle connection, the gears F, F′, and F^2, and clutch mechanism connected to driving-shaft E, in combination with automatic mechanism for disengaging said clutch from the gear at a determined degree of pressure on said movable head, for the purposes specified.

8. In a power-press having a movable head adapted to be operated in substantially the manner set forth, the means herein set forth for automatically stopping said head at a given degree of pressure, consisting of the split band J, having a lever M pivoted between its meeting ends, said band being located within a countersunk portion of gear F′ and having an annular recess around the inner face of hub K, said gear having a pin n' projecting into said annular recess, the outer end of lever M having a pin m^2 connected thereto, substantially as set forth, said pin having a collar m^3, with a spring or other elastic bearing resting on said collars, in combination with clutch G, having a beveled tongue n^3, as specified.

9. In a power-press having a movable head operated substantially as set forth, the means herein set forth for automatically stopping the head in its backward movement, consisting of a set collar R, connected to the push and pull rod H, the latter having the elongated opening and connecting mechanism with the clutch, substantially as set forth.

10. In a power-press having a movable head, the driving-gears, and reversible-clutch mechanism for imparting a reversible rotary motion to the screw-rod, in combination with said screw-rod, traveling nut, and triple toggle connection between said nut and the said movable head, for the purposes specified.

CHARLES SEYBOLD.

Witnesses:
GEORGE BASCOM,
O. M. HILL.