

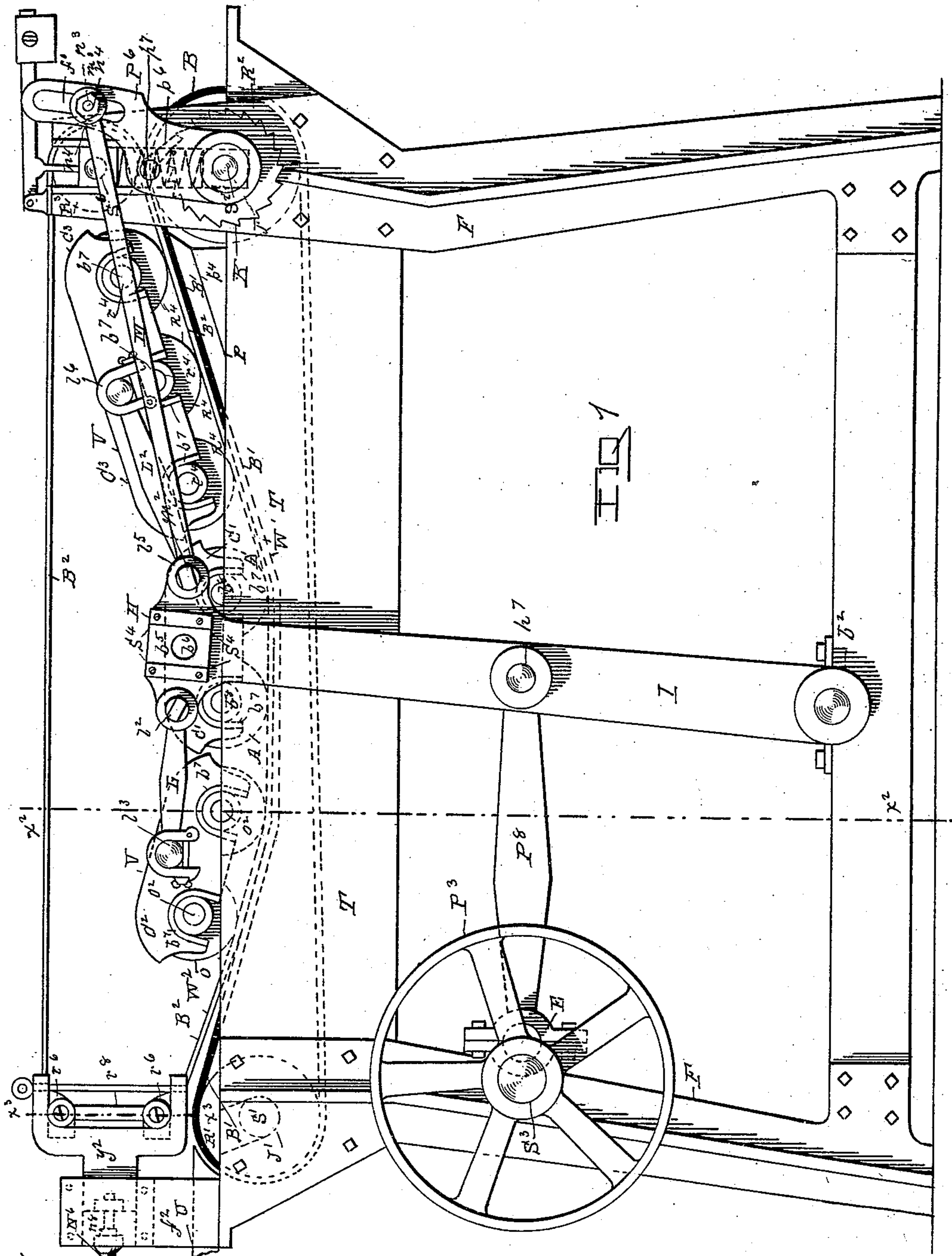
(No Model.)

5 Sheets—Sheet 1.

J. McKAY.
STARCHING MACHINE.

No. 471,619.

Patented Mar. 29, 1892.



WITNESSES
Charles S. Brintwell
William A. Sweet

INVENTOR
Joseph McKay
by W. E. Hagan atty

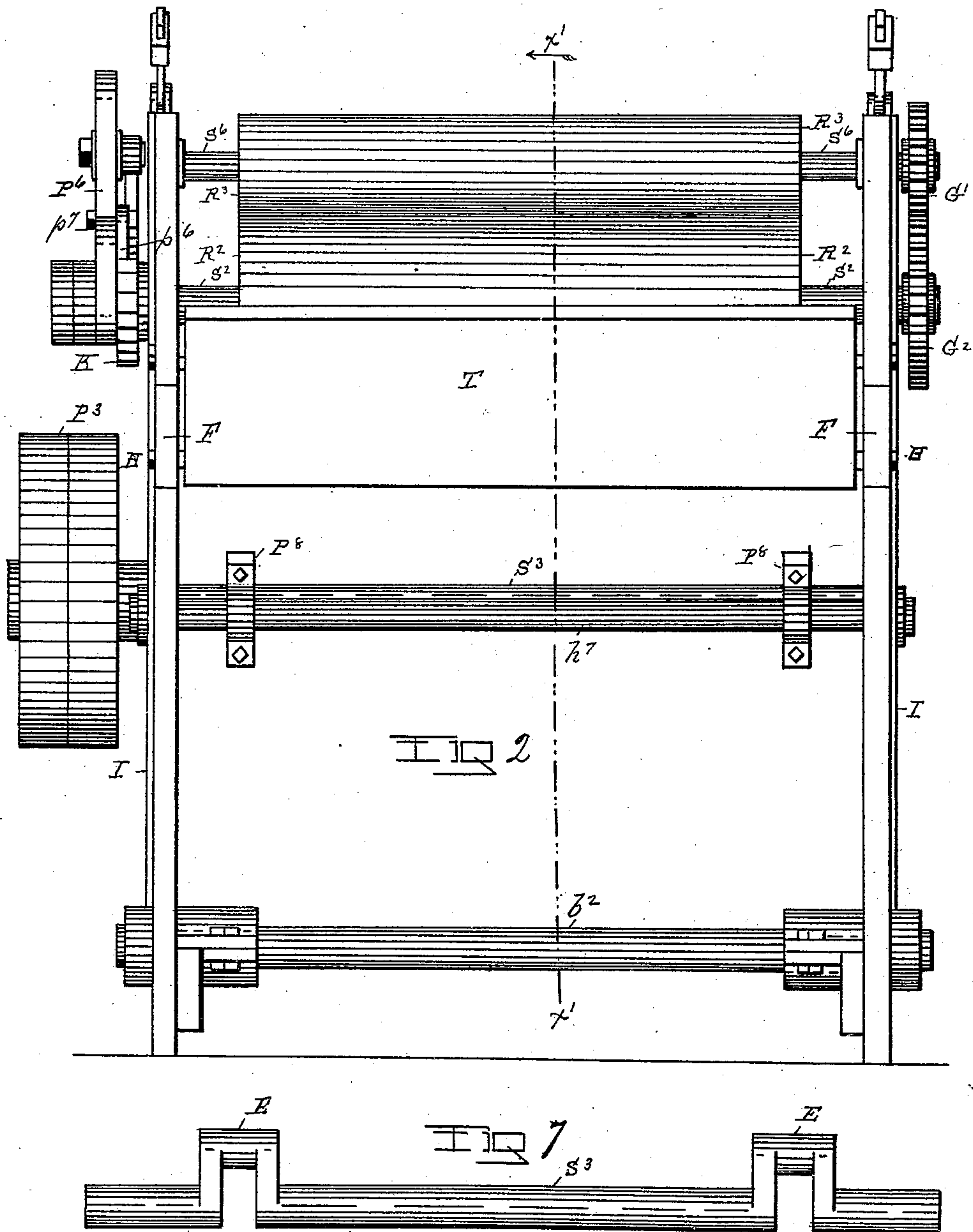
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STARCHING MACHINE.

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WITNESSES
Richard S. Brinton
William A. Sweet

INVENTOR
Joseph McKay
by W. C. Hagan atty

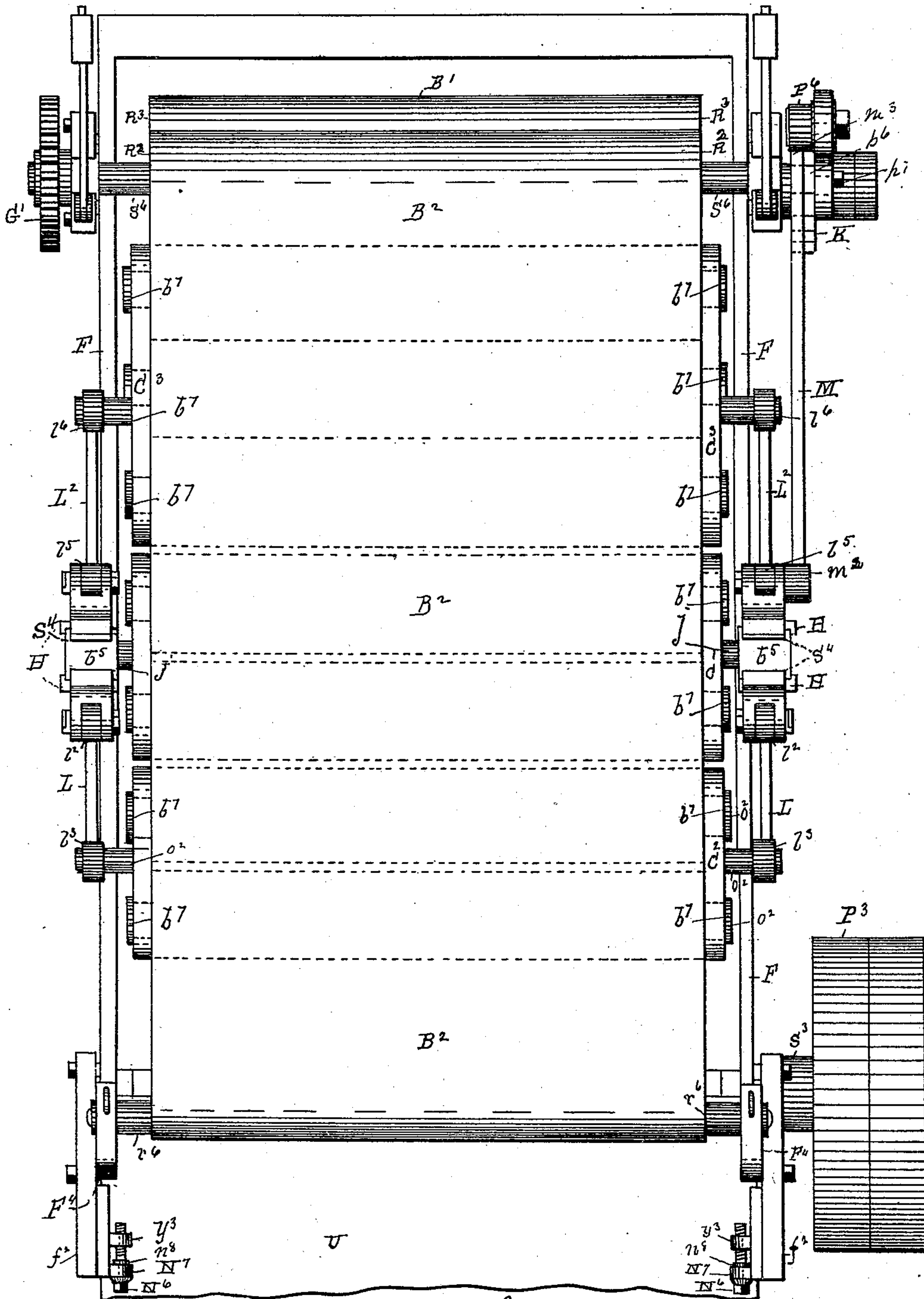
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WITNESSES
Charles S. Brintnell
William A. Sweet

FIG 3

INVENTOR
Joseph McKay
by W. C. Hagan atty

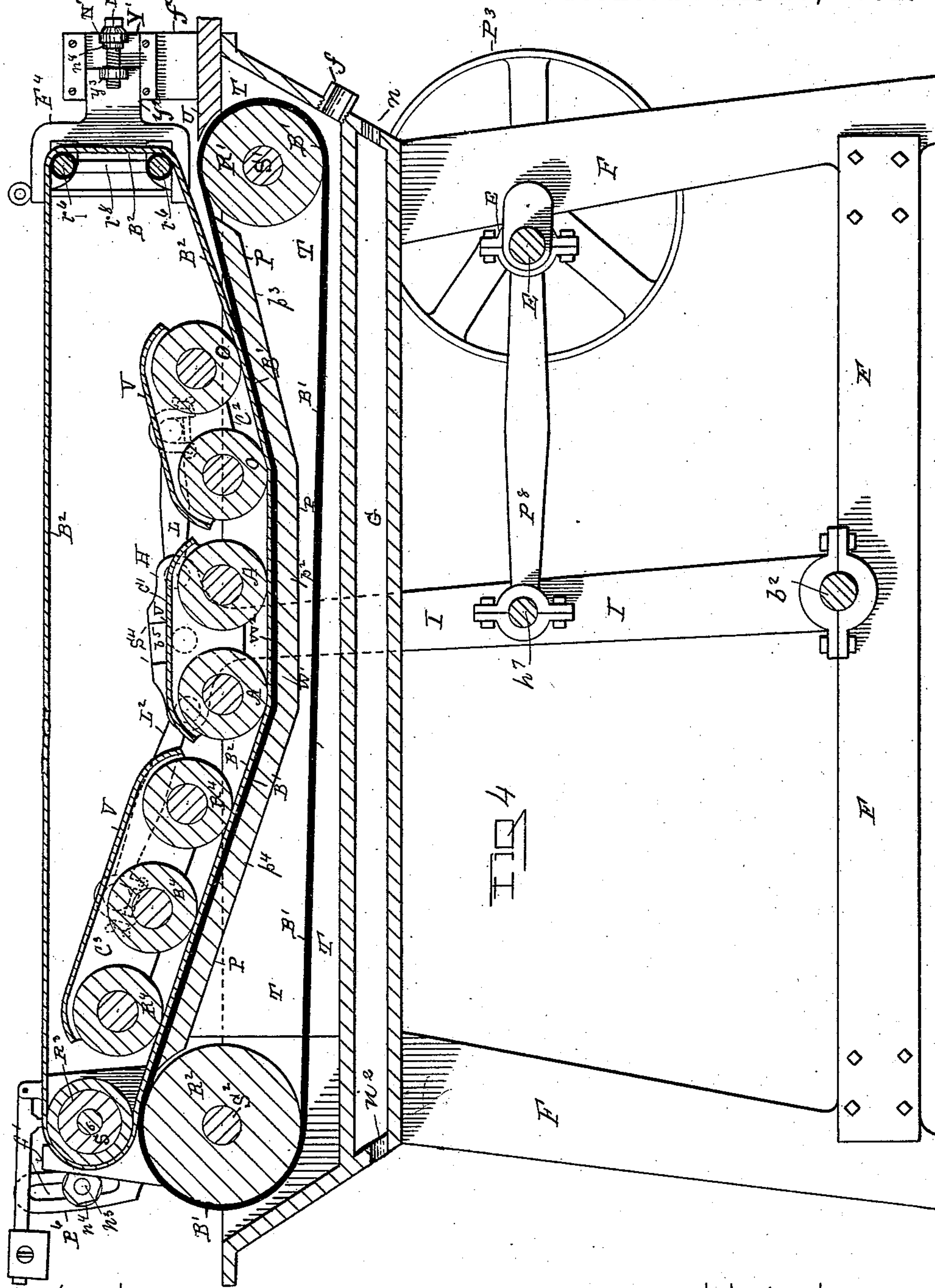
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WITNESSES

Charles S. Brintwell
William A. Sweet

INVENTOR
Joseph McKay
by W. E. Hagan atty

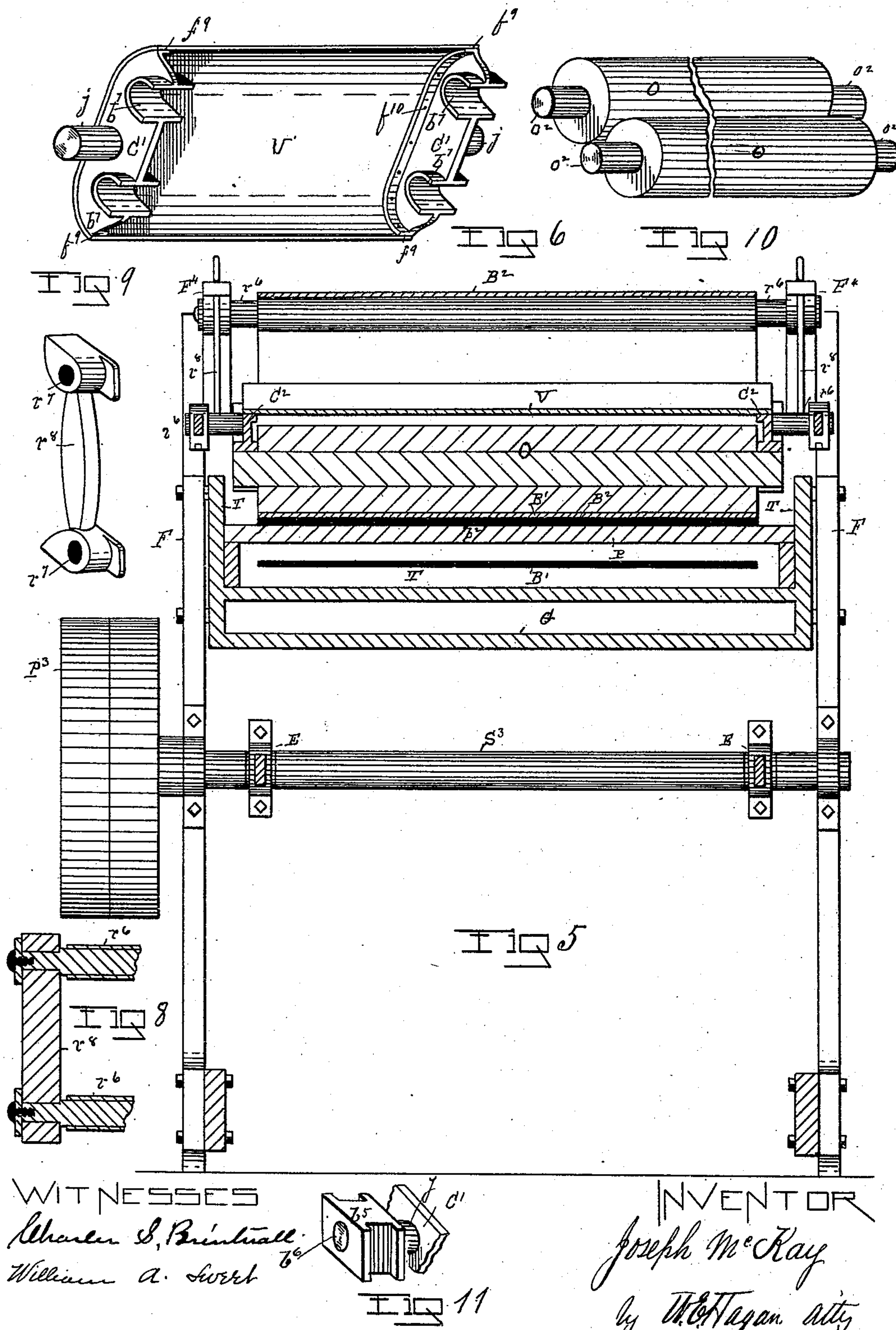
(No Model.)

5 Sheets—Sheet 5.

J. McKAY.
STARCHING MACHINE.

No. 471,619.

Patented Mar. 29, 1892.



UNITED STATES PATENT OFFICE.

JOSEPH MCKAY, OF TROY, NEW YORK.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 471,619, dated March 29, 1892.

Application filed January 27, 1891. Serial No. 379,349. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MCKAY, of the city of Troy, county of Rensselaer, and State of New York, have invented a new and useful Improvement in Starching-Machines, of which the following is a specification.

My invention relates to improvements in that class of apparatus which is used for starching apparel articles, such as collars, cuffs, shirts, &c.; and the object and purpose are to better adapt this class of devices to perform the uses for which they are designed by causing them to act upon the articles being treated similarly in effect as when operated upon by hand, and embodying with such improvement the further improvement of an increased capacity due to mechanical arrangement and construction.

Accompanying this specification to form a part of it there are five plates of drawings containing eleven figures, illustrating my invention with the same designation of parts by letter reference used in all of them.

In the illustrations, Figure 1 is a side elevation of a starching-machine containing my invention. Fig. 2 is a rear end elevation. Fig. 3 is a top view of the machine. Fig. 4 is a longitudinal section taken on the line $x'x'$ of Fig. 2. Fig. 5 is a cross-section taken on the line x^2x^2 of Fig. 1, and Fig. 6 is a perspective of the center set of starching-roller carriers and cover, shown as detached, and with what is its under surface when in position illustrated as facing the view. Fig. 7 is a view of a crank-shaft, shown as detached. Fig. 8 is a section taken on the line x^3x^3 of Fig. 1. Fig. 9 is a perspective of one of the posts in which the bearings of the upper belt front rollers journal. Fig. 10 is a perspective of two of the starching-rollers, shown as broken apart. Fig. 11 is a perspective of one of the slide-blocks, illustrated as detached from its slideway, and shown in connection with the journal of one of the center carriers having a bearing in said slide-block.

The several parts of the apparatus thus illustrated are designated by letter reference, and the function of the parts is described as follows:

The letter F designates the frame of the

machine, and T a starch-trough arranged in the top of said frame.

The letter G designates a chamber arranged in the bottom of the trough for containing steam or hot air to heat the starch and to keep the same in a liquid condition, and the letter f designates a discharge-opening made near the trough-bottom for discharging its contents when desired, and the letter n an opening for the reception of a steam or hot-air pipe for the chamber G at the bottom of the trough, and n^2 an opening for the insertion of a drip-cock for the escape of the water of condensation.

The letter P designates a platform arranged within the trough T, the function of which platform is to support and take the strain off the belts. Said platform is made with a central part horizontally placed and designated at p^2 and end-platform parts p^3 and p^4 , each of which from where it connects with the central part p^2 rises on an incline or angle ob- tuse-ly toward the ends of the trough. The platform P is made with an upwardly-inclined part at each end and a central horizontal part, so that when the starching-rollers are in reciprocation moved upwardly over the in- clines they bear more heavily upon the arti- cles between the belts on which said rollers press than when running on the flat surface alone, where the main pressure is that of grav- ity, and by the construction of the two in- clines the articles being treated are drawn down into and carried up from out of the starch in the trough.

The letter R' designates a roller having a shaft S' , which journals into the opposite sides of the frame F at J' , and which roller is located at the front or receiving end of the machine. The letter R^2 designates another roller having a shaft S^2 , that journals into the opposite sides of the frame F at J at the rear end of the machine. The letter B' designates an endless belt adapted to run over said rollers R' R^2 , so that one stretch of said belt will be over to rest upon and the other beneath said platform P.

The letter R^3 designates a roller arranged at the delivery end of the machine, and this roller R^3 has upon its shaft S^6 a gear-wheel

G', which meshes into a gear-wheel G² on the shaft S² of the roller R² to communicate intermittent rotation to said roller R³, said roller R² being operated as will be hereinafter described.

The letters r⁶ r⁶ designate two rollers arranged at the receiving end of the machine, they being arranged one above the other and having their journal-bearings r⁷ in posts r⁸, of which there is one at each side of the machine.

The letter F⁴ designates a frame at the receiving end of the machine, with which the posts r⁸ connect, and the letter f² designates uprights projected from the feeding-table U at each side thereof, each of which uprights is made with a slideway Y', made to receive a slide plate or tongue y², projected from the frame F⁴, and this slide-plate y² at each side of the machine connects with a set-screw N⁶ by means of a nut y³ on the slide-plate, and each of these set-screws N⁶ is passed through an eye N⁷ made in each of the uprights f², with a nut n⁸ on said set-screws N⁶ on the inside of the eye N⁷, with the inner end of the set-screw threaded into the nut y³ on each of the slide-plates, so that the said rollers r⁶ may by said set-screws be made adjustable as to distance from the uprights f², as shown at Figs. 3 and 4.

The letter B² designates an endless belt made to run on the roller R³ and the rollers r⁶ above the belt B', so that on its lower stretch it will be in contact with the latter throughout its engagement with the platform P. The construction and function of the belt B² will be more fully set forth hereinafter.

The letter I designates two vertically-arranged oscillating bars, each of which at its lower end is journaled onto a horizontal bar or shaft b², so that said oscillating bars may be made to oscillate at their upper ends by means of their journaled connection at their lower ends, there being one of said rocking bars at each side of the machine, as shown at Figs. 2 and 3, and these two rocking bars are connected by means of a centrally-located horizontal bar h⁷, on the ends of which each of said oscillating bars is journaled.

The letter S³ designates a shaft having its bearings in the opposite sides of the machine-frame and at one of its ends, where subtending the frame F this shaft S³ is provided with a driving-pulley P³ for communicating motion to said shaft. This shaft S³ is constructed with two cranks E E, and each of the latter has a pitman P⁸, which at one end is journaled onto the bar h⁷ of the oscillating bars I, so that when the shaft S³ is operated by its driving-pulley P³ the said oscillating bars I are caused to oscillate at their upper ends.

The letter H designates cross-heads, of which there is one arranged at the top of each of the oscillating bars I at each side of the machine, as shown at Figs. 1, 2, and 3. Each of these cross-heads is constructed with a

slide S⁴, and a slide-block b⁵ arranged therein, and this slide-block is provided with a bearing b⁶.

The letters C' designate two starching-roller carriers, of which there is one of them arranged at each side of the machine, and each of these carriers is provided with a journal j, arranged to project from and at right angles to its outer side, said journal being adapted to turn in the bearing b⁶ of one of the slide-blocks b⁵, and each of these carriers C' is constructed with semi-tube-formed bearings b⁷ b⁷ on what is its under surface when in position in the machine.

The letters A A designate two starching-rollers, each of which has a journal b⁸ at its ends which subtends the roller, so that when the carriers C' at each side of the machine are passed down over the roller-journals the latter will have a bearing in them at b⁷. This arrangement of the rollers A A, as thus connected, when the oscillating bars I are oscillated at their upper ends, causes the carriers C' to reciprocatingly move over the upper stretch of the belt B' and the lower stretch of the belt B², with the said carriers adjusting in the head H, by means of the slide-blocks, to which each one of said carriers C' is pivoted, and the slides made for the blocks in each of the cross-heads H.

The letters O O designate another pair of starching-rollers that are located in the trough T in front of the rollers designated A A. These rollers O O are provided with carriers C², each of which is like the carrier C' in form and construction, with the exception that, instead of being made to pivot at each side of the machine to a slide-block operating in a slide made in the cross-head H, each of these carriers C², located at opposite sides of the machine, is made to connect pivotally with one of the cross-heads H to receive reciprocating motion therefrom by means of a link L at each side of the machine, one end of each of which links connects pivotally at l² with one of the cross-heads H and the other end of each of which links pivotally connects at l³ with the carrier C². Each of the last-named carriers is provided with semi-tube or U-formed bearings b⁷, which are placed over the journals o² of the rollers O when the said carriers are in position, and are thus constructed and connected when the carriers C' are caused to reciprocate with their rollers running over the upper stretch W' of the belt B' and upon the lower stretch W² of the belt B², overrunning the former. The carriers C² are also operated to move with them.

The letters C³ designate two other carriers that are made like the carrier shown at Fig. 6, and there are three semi-tube or U-formed bearings b⁷ in each of these carriers C³ to receive the journals r⁴ of three starching-rollers R⁴ R⁴ R⁴. The latter rollers and the carriers C³, which operate them, are arranged in the trough T at the rear of the rollers A A and with one of the carriers located at each

side of the machine. Each of these carriers C^3 at each side of the machine is connected by means of a link L^2 with one of the cross-heads H to receive motion from the latter, each of these links L^2 being at one end pivoted at l^5 to one of the cross-heads H and at l^6 to the carrier C^3 . As thus constructed, when the bars I and their cross-heads H are operated to be reciprocated, as before described, the carrier C^3 is also reciprocated, with its rollers R^4 running over the upper stretch W' of the belt B' and the lower stretch W^2 of the belt B^2 over the former.

The letter K designates a ratchet-wheel, which is arranged on and secured to the shaft S^2 of the roller R^2 , where said shaft at one of its ends subtends the frame F . The letter P^6 designates a pawl-holder that is arranged on said shaft S^2 so as to turn thereon, and p^6 a pawl that is mounted on said pawl-holder by means of a pivoted connection p^7 .

The letter M designates a rod, which at its front end m^2 is pivotally connected with the cross-head H and at its rear end m^3 is pivotally connected with the pawl-holder P^6 , so that as the cross-head H is reciprocated the rod M is operated by its connection therewith to actuate the pawl-holder and pawl to engage with the ratchet-wheel K to intermittently rotate the roller R^2 and move the belts B' and B^2 with alternating periods of motion and intermediate periods of rest.

To regulate the throw of the pawl-holder and the measure of the belt movement, the pawl-holder P^6 is provided with a slot f' in its upper end, through which the pin n^3 , on which the rod M pivots, passes, with this pin held in place in the slot f' by means of a nut n^4 .

While the machine can be used without the upper belt B^2 for some kinds of work, yet when combined with said belt B^2 it is better adapted for all kinds of work.

The letters V designate covers that are used to house in the rollers to keep out dust and such substances as might fall into the starch, and these covers are constructed to rest on flanges f^9 , made on the inside face of the carrier sides, and are connected to said flanges by screws f^{10} , as shown at Fig. 6, and are thus constructed so that said covers may be easily removed for cleaning the apparatus.

To operate the mechanism thus illustrated and described, hot starch having a proper condition of fluidity is supplied to the trough T and a driving-belt put on the pulley P^3 , which causes the bars I to oscillate on their journaled connection and so as to reciprocatingly move the heads H , their rollers, and the connected carriers, with their rollers moving over the lower stretch of the belt B^2 and above the upper stretch of the belt B' , (the latter being beneath the former thereat and resting on the platform P), with the roller R^2 , as operated by the ratchet, to move and advance intermittently the belt B' , and the geared connection made by the roller R^2 , operating the roller R^3 ,

and the belt B^2 also to move intermittently. Articles to be starched are placed on the table U and entered between the belts B' and B^2 and are carried down beneath the starching-rollers O , A , and R^4 to be rubbed and pressed by the latter, so as fill the fabric with starch as the said rollers are reciprocated within the trough. The articles are removed from off the belt where the latter commences to make its return stretch after passing from off the roller R^2 . As thus treated, the articles are rubbed and pressed so as to make them take up the starch without the intervention of skilled labor and the hard manual work required to do it by hand.

The belt B^2 is preferably made of openly-woven material, that the starch will readily soak through to reach the articles being starched, and the tension upon this belt may be regulated by the set-screws N^6 , arranged in the uprights f^2 and their engagement with the slides which project from the frame part F^4 , in which the bearings of the rollers r^6 are retained.

As a series of starching-rollers constructed substantially as herein described would perform the same function whether reciprocated by the means which I employ for that purpose or some other means that would operate them in substantially the same manner, hence I do not limit my invention to the combination of the said starching-rollers to the particular means which I illustrate as applied to reciprocate them.

It is essential to do good work that starching-machines should be thoroughly cleaned when they cease working and before the starch adhering to the parts becomes dry to flake off and spot the work when the machine is again used. By making the end carriers with U -formed bearings and connecting them by links with the cross-heads the links are easily disconnected and the end carriers and rollers removed, so that by removing the cover of the center carriers access is easily had to the starch trough and platform, as well as the center rollers, to thoroughly cleanse them, and this result in the main is produced by the connection made by the U -formed bearings of the end carriers.

The manner in which the starching-rollers are arranged in carriers as I illustrate and describe them adapts the parts to be easily removed for cleaning them and their replacement after the latter is accomplished.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a starching-machine, the combination, with a trough adapted to contain liquid starch, of starching-rollers mounted in carriers having inverted- U -formed bearings for the journals of said starching-rollers, with the latter adapted to be moved back and forth within said trough and to be disconnected from the carriers, substantially in the manner as and for the purposes set forth.

2. In a starching-machine, the combination, with a trough or receptacle adapted to contain liquid starch and constructed with a platform-support that has a flat central portion and upwardly-slanting end portions, of a roller at each end of said platform, an endless belt passing over said rollers with its lower stretch below and its upper stretch above said platform and actuated to be moved intermittently, and starching-rollers constructed to be moved back and forth above and upon the upper stretch of said belt over said platform, substantially in the manner as and for the purposes set forth.

3. In a starching-machine, the combination, with a starch-receptacle having a belt-support, substantially as described, of two belts arranged one above the other, the lower one of which is operated to move with its upper stretch resting upon said belt-support and the upper belt having its lower stretch resting upon the upper stretch of the lower belt when in contact with said belt-support throughout its length and operated to move in the same direction as the lower belt, and starching-rollers operated to be moved back and forth upon and over the lower stretch of the upper belt, substantially in the manner as and for the purposes set forth.

4. In a starching-machine, the combination, with a trough or receptacle adapted to contain liquid starch and having an interiorly-placed platform-support, of two belts arranged upon rollers and operated to be moved intermittently in the same direction over said platform-support with the upper stretch of the lower belt in contact with the lower stretch of the upper belt, and starching-rollers constructed and arranged to be moved back and forth and reciprocatingly rotated in contact with and upon the lower stretch of the upper belt, substantially in the manner as and for the purposes set forth.

5. The combination, with the trough T, having the platform P, of the rollers A A, mounted in carriers C', with the latter journaled into the slide-blocks b^5 at each side of the machine, the starching-rollers O O, mounted in the carriers C², the starching-rollers R⁴ R⁴ R⁴, mounted in the carriers C³, and the cross-heads H H, each made with a slideway for the slide-blocks b^5 and connected to the carriers C² and C³ by links and arranged to be operated, substantially in the manner as and for the purposes set forth.

6. The combination, with a trough adapted to contain liquid starch and having an interior platform, of two endless belts operated by rollers to move together in the same direction over said platform with the upper stretch of the lower belt in contact with the lower stretch of the upper belt where resting on

said platform, three sets of starching-rollers with the rollers of each set mounted to journal in a carrier at each side of the machine and to rest upon the lower stretch of the upper belt, a journal projected laterally from the outer side of each of the center carriers, a vertical bar at each side of the machine having a cross-head at its upper end made with a slide, said bars being constructed to be oscillated at their upper ends, a slide-block in each of the slides of said cross-heads provided with a bearing for the journal of the center carrier, and links connecting the end carriers with the cross-heads, substantially as and for the purposes set forth.

7. In a starching-machine having a trough made with an interior platform, the combination of the roller R' and the rollers r^6 r^6 at the front end of the machine, the roller R² at the rear end of the machine and provided with a ratchet K at one end, the pawl-holder P⁶, provided with a pawl p^6 , operated to intermittently rotate said roller R², a gear G², arranged to mesh into the gear on the shaft of the roller R³, the endless belt B', arranged on the rollers R' and R², and the endless belt B², arranged on the rollers R³ and r^6 , substantially in the manner as and for the purposes set forth.

8. In a starching-machine, the combination, with a starch-trough having a heating-chamber beneath its bottom and constructed with an interior platform, substantially as described, of two endless belts, one arranged above the other and operated by rollers to intermittently move in the same direction, with the upper stretch of the lower belt above and its lower stretch below said platform and the lower stretch of the upper belt above and in contact with the upper stretch of the lower belt, and starching-rollers mounted in carriers and operated to be moved back and forth and to reciprocatingly rotate in contact with the lower stretch of the upper belt where within the trough, substantially in the manner as and for the purposes set forth.

9. In a starching-machine, the combination, with a trough adapted to contain liquid starch, of starching-rollers mounted in carriers at each side of said machine, said carriers having inverted-U-formed bearings to receive the journals of said rollers, and covers arranged to be over said rollers and rest on said carriers, substantially in the manner as and for the purposes set forth.

Signed at Troy, New York, this 7th day of January, 1891, and in the presence of the two witnesses whose names are hereto written.

JOSEPH MCKAY.

Witnesses:

CHARLES S. BRINTNALL,
W. E. HAGAN.