No. 815,861. PATENTED MAR. 20, 1906.

W. C. PERRY.

MACHINE FOR MEASURING, COUNTING, AND CUTTING OFF FABRIC.

APPLICATION FILED AUG. 3, 1904.

4 SHEETS—SHEET 1.

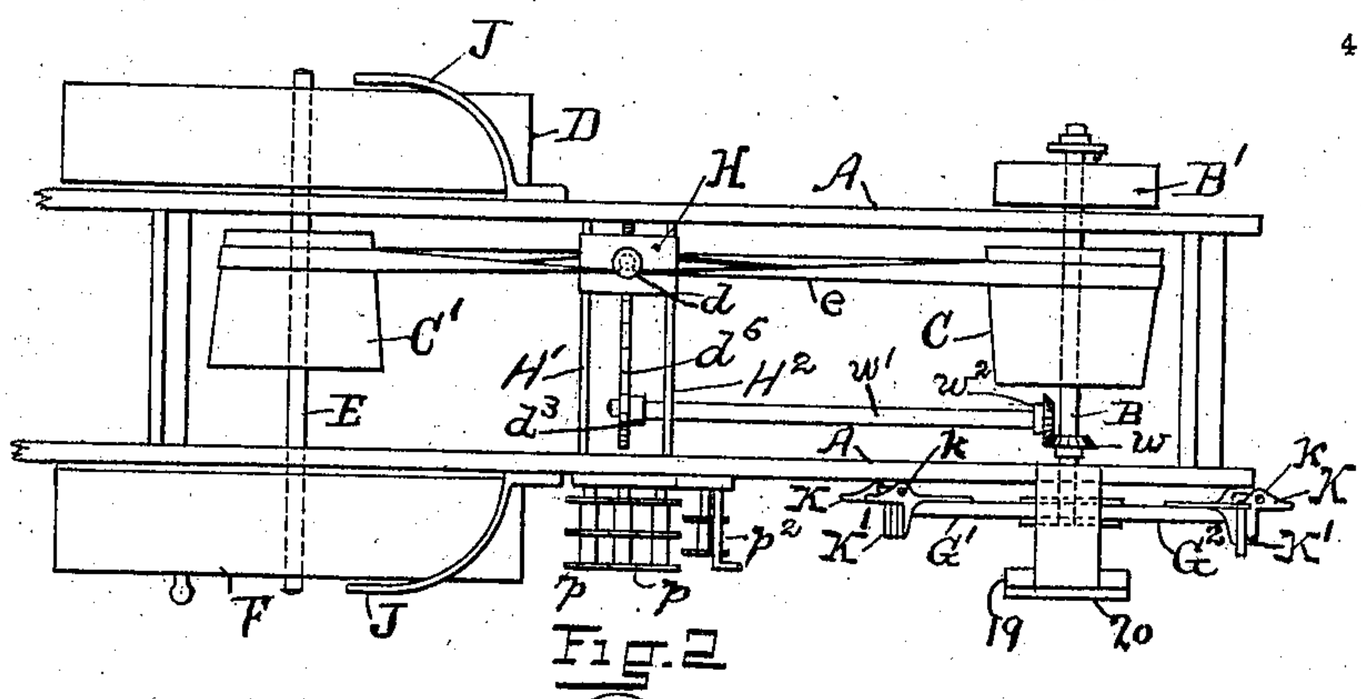

Fig. 2

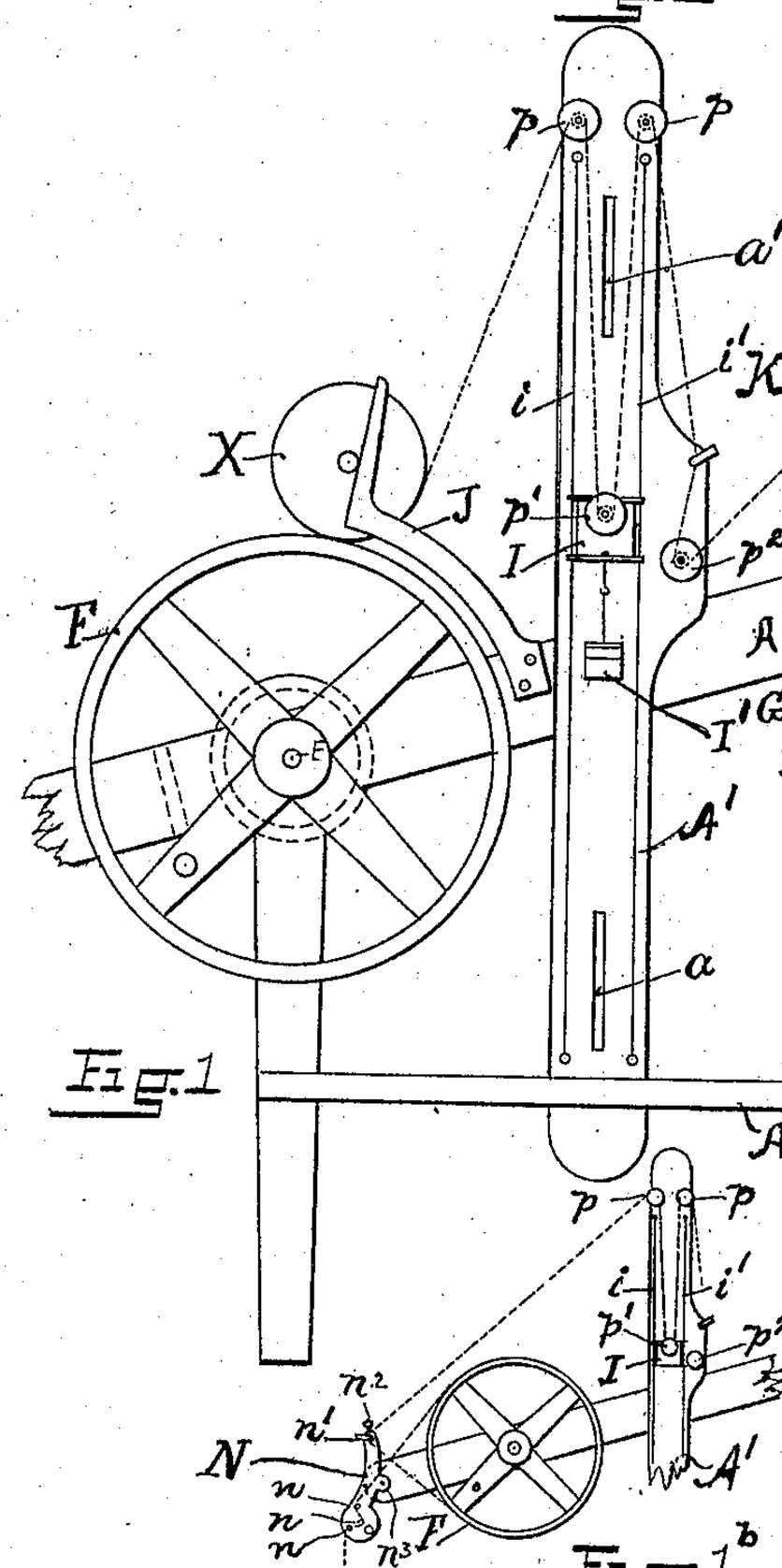

Fig. 1

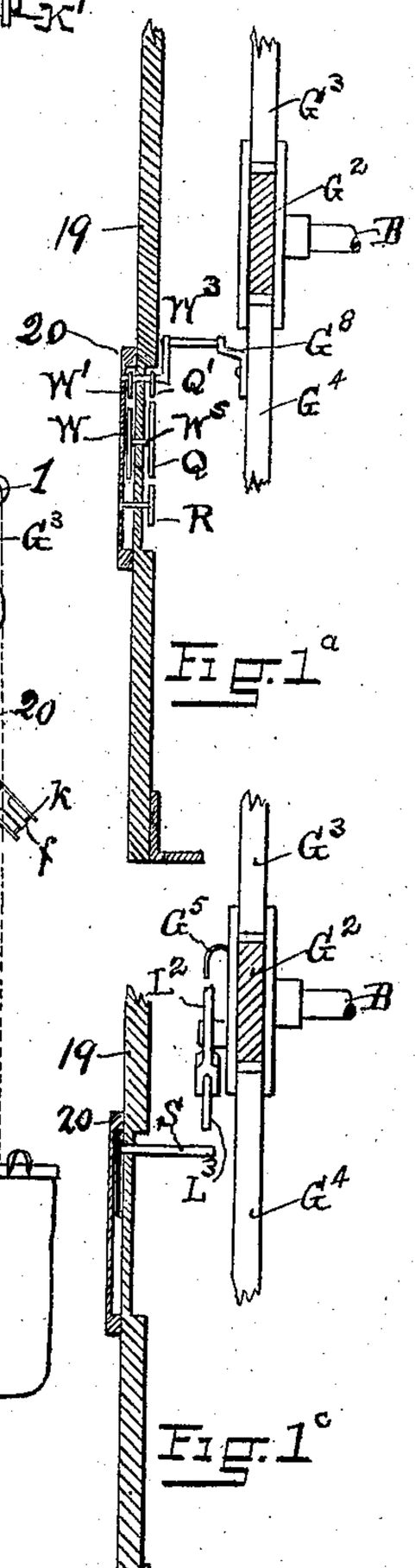

Fig. 1ª

Fig. 1ᶜ

Fig. 1ᵇ

WITNESSES

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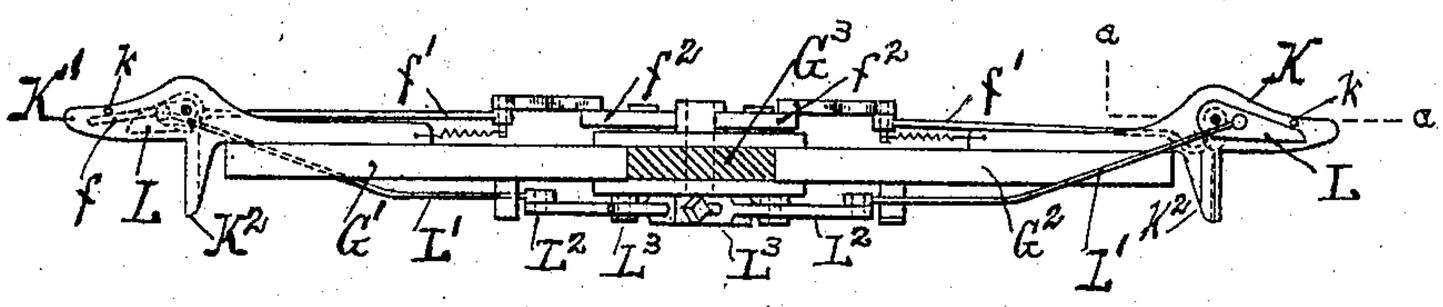

Fig. 4

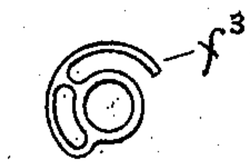

Fig. 5

Fig. 3

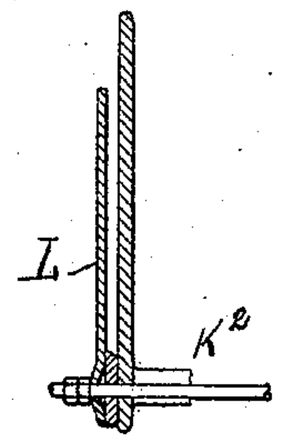

Fig. 4a

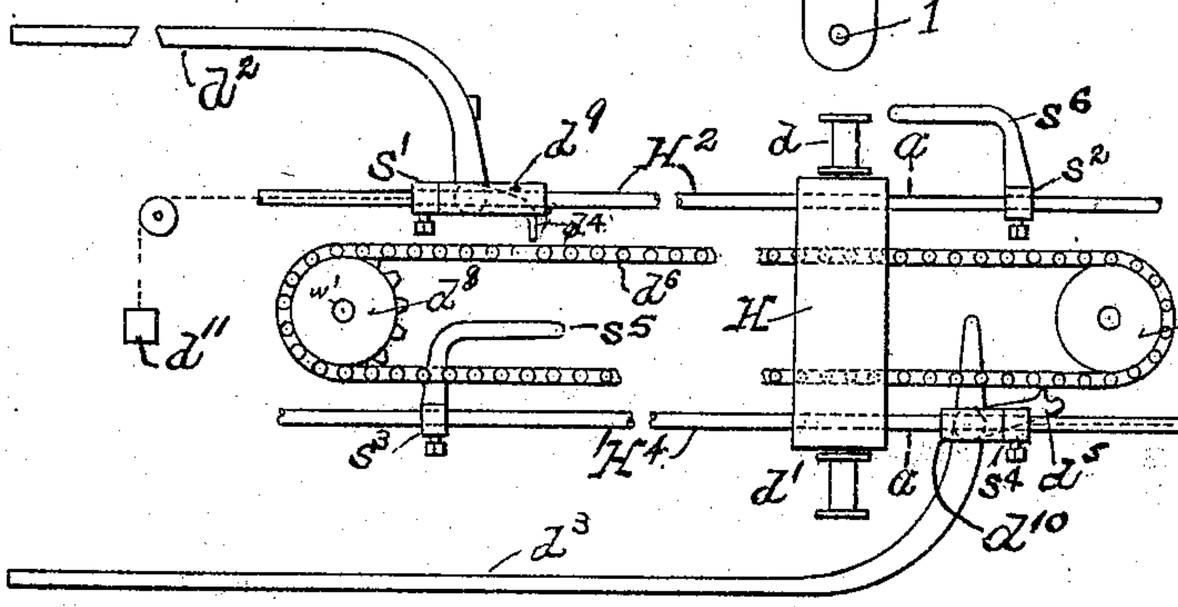

Fig. 6

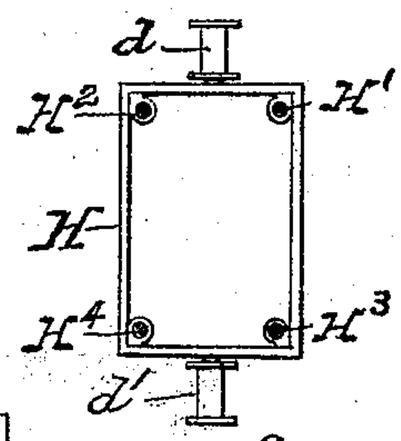

Fig. 6a

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4 SHEETS—SHEET 3.

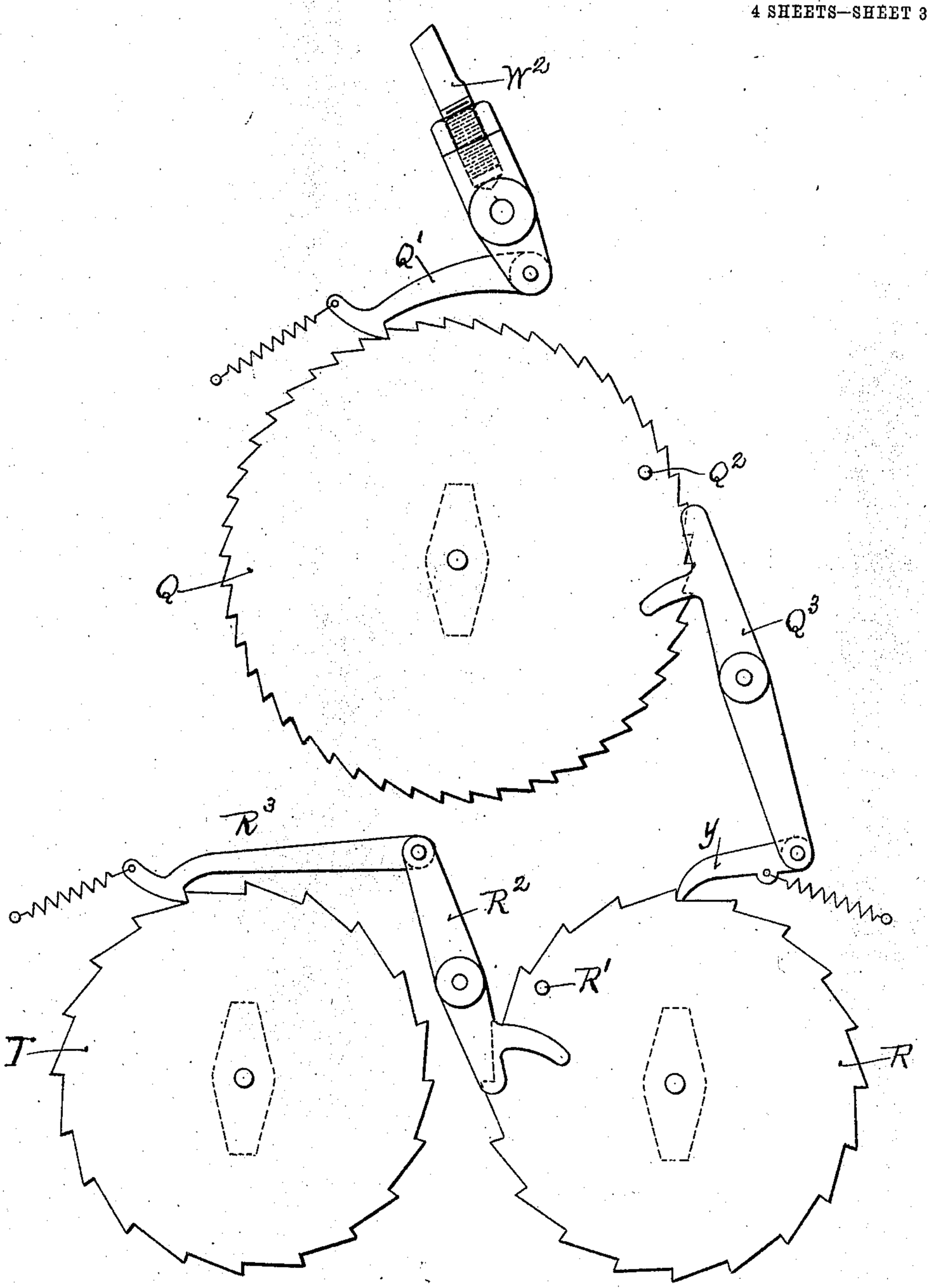

Fig. 7

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4 SHEETS—SHEET 4.

Fig. 8

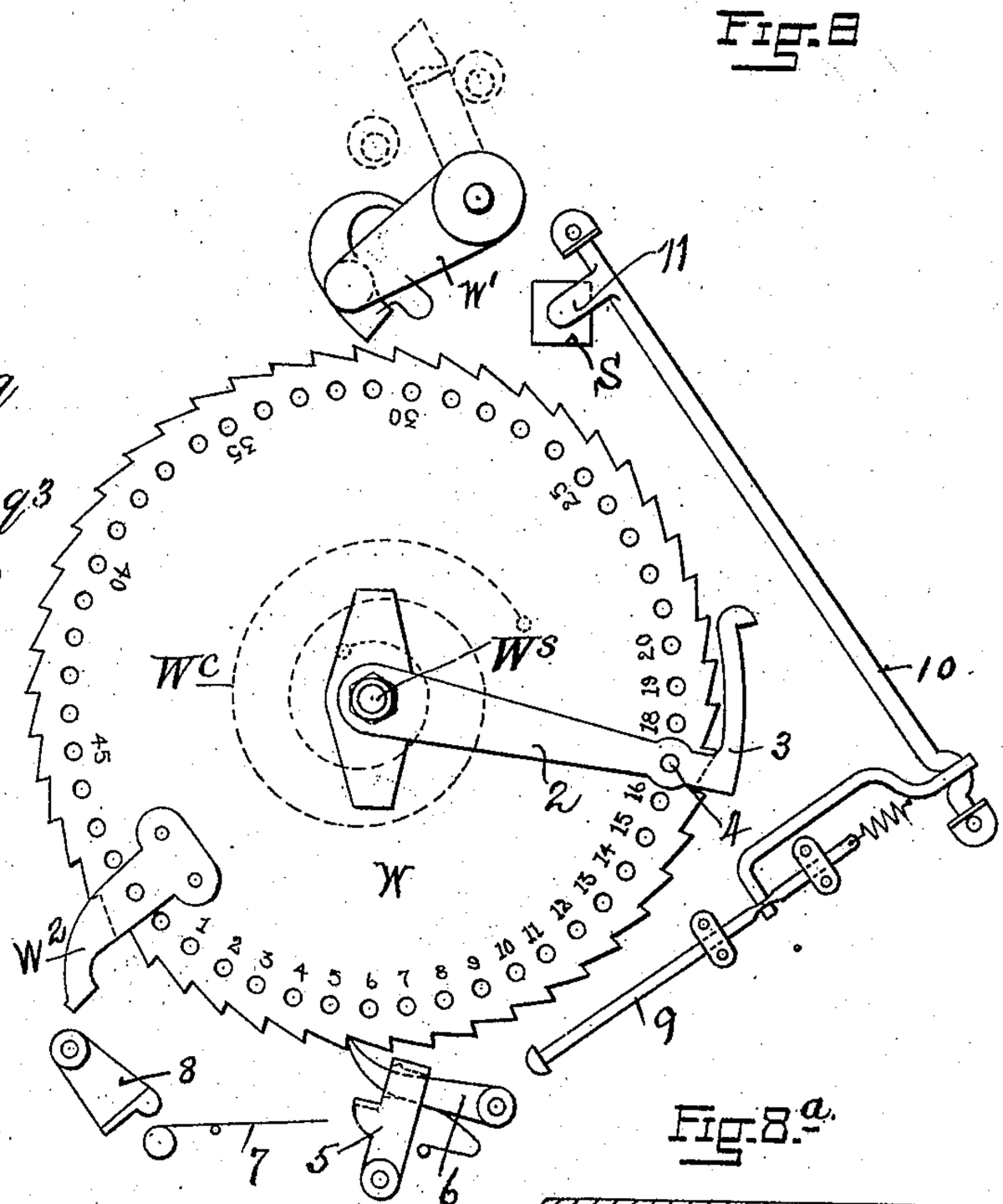


Fig. 8a

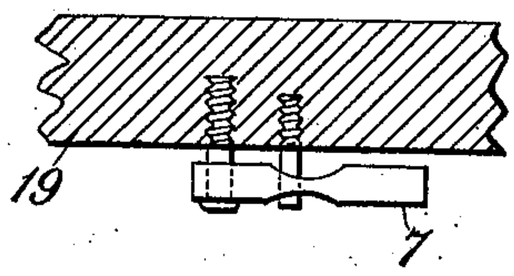


Fig. 9

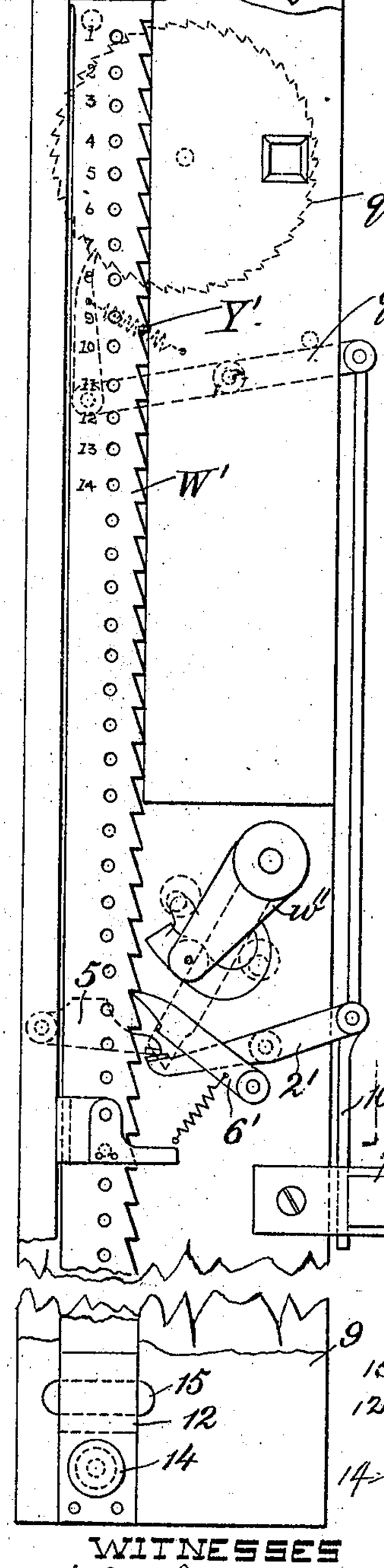
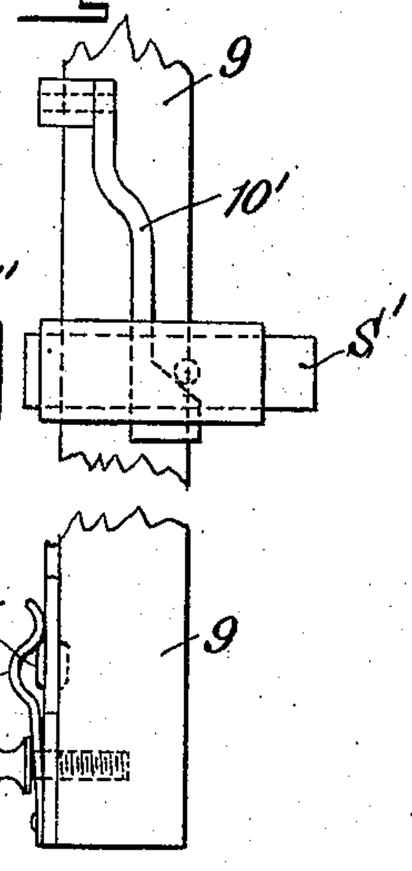


Fig. 9a



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MEASURING, COUNTING, AND CUTTING OFF FABRIC.

No. 815,861. Specification of Letters Patent. Patented March 20, 1906.

Application filed August 3, 1904. Serial No. 219,371.

To all whom it may concern:

Be it known that I, WILLIAM C. PERRY, a citizen of the United States, residing in Charlestown, in the county of Washington and State of Rhode Island, have invented a new and useful Machine for Measuring, Counting, and Cutting Off Fabric, of which the following is a specification.

The purpose of my invention is to provide a machine by which fabric, elastic or inelastic, textile or otherwise fabricated, may be accurately and automatically measured, cut off into predetermined lengths, and the units of measurement of the fabric automatically and accurately registered.

To these ends my invention consists in the novel constructions, combinations, and arrangements of parts hereinafter more fully described, and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of a machine embodying my invention. Fig. 1^a is a longitudinal section of a part thereof, taken on line *a a* of Fig. 1. Fig. 1^b is an elevation of a part of the machine, showing a modification of the intake device. Fig. 1^c is a longitudinal section on line *c c* of Fig. 1. Fig. 2 is a plan view of the machine. Fig. 3 is an elevation of the spider or measuring arm carrying the measuring, counting, and cutting-off and marking and registering actuating mechanisms. Fig. 4 is a plan view of the same with a partial section on line 4 4 of Fig. 3. Fig. 4^a is a section on line *a a* of Fig. 4. Fig. 5 is a plan view of the cam which actuates the fabric-holding fingers. Fig. 6 is an elevation of the feed-regulating mechanism. Fig. 6^a is a transverse section on line *a a* of Fig. 6. Fig. 7 is an elevation of the registering mechanism. Fig. 8 is an elevation of the counting mechanism. Fig. 8^a is a plan of the spring 7 with its support in broken cross-section. Fig. 9 is an elevation showing a modification of my invention as applied to a sliding instead of a rotary counting mechanism. Fig. 9^a is an edge view of portions of the same.

Similar reference letters and numerals indicate like parts where they occur in the drawings.

In a frame A is mounted a driving-shaft B, carrying a driving-pulley B′, (preferably a clutch-pulley,) adapted to receive the usual driving-belt, a cone-pulley C, and a bevel-gear *w*. On the outer end of said shaft is mounted a spider G, composed of a plurality of arms $G' G^2 G^3 G^4$, revoluble with said shaft. In said frame A is also journaled a second shaft E, carrying at one end a pulley D and at its opposite end another pulley F, adapted to serve as a feed pulley or drum. A second cone-pulley C′, mounted on said shaft E, is connected with the cone-pulley C by a belt *e*, run in a half-turn, so as to engage flatwise with shifting rolls *d d′*, carried on the shifting carriage H, arranged to slide along the ways H′ H^2, secured to the frame A, as actuated by the respective shifting rods d^2 d^3, in turn actuated by pawls d^4 d^5, arranged to engage with an endless chain d^6, engaging a pulley d^7 and sprocket-wheel d^8, mounted upon a shaft *w′* and carrying a bevel-gear w^2, meshing with the gear *w* on the driving-shaft B. Said shifting-rods d^2 d^3 are respectively pivotally mounted upon slides d^9 d^{10}, arranged to slide, respectively, along the upper way H^2 and way H^4, arranged immediately below and secured to the frame A. A similar way H^3, arranged immediately below the way H′, serves in conjunction with the other three ways for the shifting carriage H to slide upon. Said shifting rods d^2 d^3 project through slots *a′ a* in the standard A′, secured upon the frame A, and are respectively actuated for movement in their vertical plane by the vertically-sliding weighted carriage I, to thereby cause the engagement of the respective pawls d^4 d^5 with the endless chain d^6. Adjustable stops $s' s^2 s^3 s^4$, slidable on the ways H^2 H^4, serve to limit the movement of the shifting rods and their pawls in either direction. Said carriage I slides on guides *i i′*, preferably of wire to obviate friction, mounted on said standard A′ parallel with each other and the face of said standard. Any suitable means may be employed to take up slack of the guides and keep them sufficiently taut to allow the carriage to slide freely along them. Flanged pulleys *p p* are rotatably mounted on said standard A′, and a similar flanged pulley *p′* is similarly mounted on the carriage I. On a bracket at one side of the standard A′ is rotatably mounted another flanged pulley p^2.

On each side of the frame A is secured a rigid bracket-arm J, extending outside of the pulley D and feed-pulley F and adapted to serve as supporting-rests for a beam X, carrying the fabric to be operated upon and held against said brackets by gravity, while lying

upon and rotating with the pulley D and drum F. The fabric (indicated by the dotted line in Fig. 1) in that case passes directly from said beam over the pulley *p* into the machine.

A crank-shaped arm N, Fig. 1[b], is secured upon one side of the frame A by a bolt, as n^3, adapted to normally hold said arm rigid and to be temporarily slackened to allow said arm to be pivotally moved on said bolt, as may be required for purposes of adjustment, to bring its upper end nearer to or farther from the feed-wheel F. Friction-pins *n n n*, projecting laterally from the lower part of said arm at one side of said bolt, serve to maintain the tension on the fabric as it is being fed into the machine. A guide-arm n', mounted at the upper end of the arm N and adjustable laterally with reference to the latter, serves to guide the fabric onto the feed-wheel F. A set-screw n^2 binds the guide-arm n' in position. The fabric indicated by the dotted line in Fig. 1[b] in this case travels from the basket, engaging with the pins *n n n*, around the pulley F, back into engagement with the guiding-arm n', thence over the pulley *p* into the machine.

The outer end of each diametrically opposite arm G′ G² of the spider is provided with an end piece K, composed of the arms K′ K², arranged at right angles to each other, the arm K′ being preferably slotted and provided with a transverse stop bar or pin *k*. Said end piece K is preferably provided with oblong slots K³, arranged to be engaged by a bolt K⁴, by means of which the end piece is adjustable longitudinally of its arm, Fig. 3. A holding-finger *f*, pivoted in said slotted arm, is actuated to swing against said stop-bar or against the side of the arm K², as actuated by a spring-controlled rod f', and the connected spring-controlled cam-latch f^2, operating against the face of the rigid cam f^3, secured upon the frame of the machine at the rear of the center of the spider G. As the said cam-latch f^2 rides up upon the face of the cam f^3 it actuates the rod f' to swing the holding-finger *f* down against the face of the arm K² to firmly clamp and hold the fabric passing over said arm and draw it through the machine as the spider G revolves. When said cam-latch passes over and out of engagement with the face of the cam f^3, said spring-controlled rod f' acts to swing the holding-finger back against the stop *k*, releasing the fabric and allowing it to drop into a basket or other receptacle placed to receive it. As the revolution of the spider is continued the next holding-finger and its connected actuating rod and cam-latch act in a similar manner, thus insuring a continuous feed of the fabric through the machine while it is clamped and released alternately at each half-revolution of the spider G.

Upon the side of each arm K² is pivoted a cutting-blade or knife L, connected by the actuating-rod L′ with a spring-controlled lever-arm L², pivoted upon the face of the center of the spider G. Said lever-arm L² is provided with a laterally-projecting arm L³, which by contact with a sliding bolt S, arranged to be thrown by the action of the counting mechanism, as hereinafter described, into the path of said arm L³ serves to actuate said lever-arm L² and its connected rod and cutting-blade. Said cutting-blade is fitted upon the side of the arm K² in such manner as to constitute with the forward edge of said arm a shear having one side stationary and the other movable. Such cutting-blade is made longer or shorter, according as it is to be used to cut the fabric entirely through or only to nick one edge for marking purposes.

It is understood that while I have described one holding-finger and one cutting-blade and their respective operating connections as applied to one arm of the spider G such description is to be applied to precisely similar parts applied to the diametrically opposite arm of said spider.

The intermediately-located arms G³ G⁴ are each provided with a transversely-directed bearing or guide-pin 1, adapted to serve as a support or guide for the fabric in its passage from one holding-finger to the other. The arms G′ G² G³ G⁴ are preferably quadrantally arranged, so that their outer ends will be equidistant from each other. As described, the holding-finger-carrying end pieces are adjustable longitudinally of their supporting-arms, so that the distance from one holding-finger to the other embracing either guide-pin 1 will be maintained at one yard. This adjustment will be useful in case it is desired to measure the fabric before all the operations and manipulations of manufacture have been completed and the stretch and shrinkage thereby removed.

In the form of counting mechanism illustrated in Figs. 1, 1[a], and 8 a toothed wheel W, mounted upon a shaft W[s], operating in a portion of the frame directly in front of the spider G, is rotated by means of a spring-controlled pawl W′, provided with a crank-arm W³, actuated on each half-revolution of the spider G by studs G⁷ G⁸, projecting at right angles to the faces of the spider-arms G³ G⁴. The teeth of said wheel are graduated so that the distance between each two teeth will represent one yard linear measure, and upon the face of said wheel opposite such teeth are serially-arranged corresponding orifices or recesses serially numbered, as may be desired. In the drawings I have shown such orifices numbered from 1 to 50; but obviously any other system of numeration may be used. Pivoted upon the shaft of said wheel is an arm 2, provided at its outer end with an integral offset pawl 3 and with a pin 4, arranged

to register with the serially-numbered orifices at will to thereby determine the length of fabric to be measured. In Fig. 8 I have shown said pin in engagement or register with the No. 17 orifice, and in that case the fabric would be measured in lengths of seventeen yards each, as will be later explained. Said pin 4 being in engagement with one of said orifices, the arm 2 will necessarily rotate with said wheel in either direction. When said wheel has by the pawl W′ and its connected mechanism above described been rotated to indicate the predetermined number of yards, the arm 2 will strike forcibly against a pivoted latch 5, arranged to engage the spring-controlled holding-dog 6 to withdraw the latter and hold it out of its engagement with the teeth of the wheel W and allow the latter to be returned to its original position by the action of its controlling-spring W^c. (Indicated by the dotted lines in Fig. 8.) In the described reverse rotation of the wheel W an arm W^2, projecting, as shown, beyond the perimeter of the wheel, is brought into forcible contact with the holding-latch 5 to thereby release the holding-dog 6 and allow it to fly into engagement with a tooth of said wheel. These operations are repeated in each instance as the predetermined number of yards of fabric have been measured. To prevent rebound or backlash of the wheel, I arrange a spring, as 7, preferably flat and weakened slightly in its central cross-section, so that it will engage and hold the arm W^2 after it has released the holding-dog, as described, and still allow the arm to be carried back as the wheel is again started ahead on a new count. On occasion when it may be desired to run the fabric through the machine without measuring its length the holding-dog 6 may by the latch 5 be held out of engagement with the wheel W and the arm W^2, held by the holding-latch 8, arranged to be moved at will into the path of said arm. The spider of the machine may then be operated to draw the fabric through the machine without rotating the wheel W. It will be noted that the pawl W′ is normally out of engagement with the teeth of the wheel W while the holding-dog 6 is normally in such engagement. The result is that the wheel is moved ahead one tooth at a time by the pawl W′ and held by the holding-dog, such alternate actions of the pawl and holding-dog continuing until the latter is thrown out, as described, by the offset arm 3, when the wheel is free, as influenced by its controlling-spring W^c, (shown by dotted lines,) to rotate backward to its original position. At the termination of the predetermined counting movement of the wheel W the offset arm 3 at the same time it knocks the holding-dog 6 out of engagement with the tooth of the wheel actuates a spring-controlled rod 9, operatively connected with a double crank-shaft 10, provided with an arm 11, adapted on the partial rotation of said crank-shaft to push the slidable bolt S into the paths of the arm L^3 of the cutting-blade-operating lever-arm L to actuate the latter, as hereinbefore described. Horizontally-projecting lugs G^5 G^6, respectively, fixed upon the face of the arms G′ G^2, as the spider G is revolved strike against the end of said bolt S and push it back to its normal position ready for the next movement of the crank-shaft 10. These operations are repeated on the completion of the measurement of each predetermined length of fabric.

The registering mechanism as illustrated in Fig. 7 consists of the toothed wheels Q R T, rotatably mounted and conected operatively by the levers and pawls hereinafter described. The wheel Q is mounted upon the same shaft with the wheel W and rotatable therewith in one direction only, is actuated by a spring-controlled pawl Q′, mounted upon the same shaft as the pawl W′, and actuated jointly therewith by the crank-arm W^2, carried on said common shaft, and operated, as described above, on each half-revolution of the spider G by the studs G^7 G^8, respectively, carried on the arms G^3 G^4. The wheel Q is provided with teeth graduated to correspond with the teeth of the wheel W, so that the movement in one direction of said wheels is synchronous, the wheel W having a reversing movement, as described hereinbefore, not common to the wheel Q. The wheel Q is provided with a projecting stud or boss Q^2, adapted on each completed revolution of said wheel to actuate the pivoted lever Q^3 and its connected spring-controlled pawl Y to partially rotate the wheel R and bring the proximate tooth of the same into engagement with said pawl Y, and so on until said wheel R has made a complete revolution. The wheel R is similarly provided with a stud or boss R′, adapted to operate the pivoted lever R^2 and its connected spring-controlled pawl R^3 to bring the pawls R^3 into engagement with the proximate tooth of the wheel T on each complete revolution of the wheel R. The teeth of the wheels R and T are numbered. The first tooth of the wheel R bears the same number as the final tooth of the wheel Q, and the initial tooth of the wheel T bears the same number as the final tooth of the wheel R. Provision is made for reading said numbers through suitable openings *o* in the face of the inclosing case.

The counting and registering mechanism illustrated in Figs. 9 and 9^a embodies the same principles as that illustrated in Figs. 7 and 8, the parts being arranged to accommodate a slidable counting-bar instead of a rotary counting-wheel, and a spring 12, adjustably secured to the frame of the machine—as, for instance, by a thumb-screw 14—is adapted by its engagement with a bar 15, secured transversely of the sildable counting-

bar, to prevent rebound of said bar in the same way that the spring 7 and arm W^2 prevent rebound of the wheel W.

In practical operation of my invention the fabric may be taken directly from the beam X, resting upon the top of the pulleys D and F with the ends of its shaft against the brackets J. In this case the fabric runs from said beam over the pulley *p*, around the pulley *p'*, over the pulley *p*, around the guide-pulley p^2, to the arm of the spider G, the rotation of which causes the holding-finger *f* to clamp upon the fabric and draw it through the machine as such rotation is continued until said holding-finger is withdrawn to release the fabric. The holding-fingers act alternately in grasping and releasing the fabric. In order to preserve and maintain a uniform tension or stretch on the fabric during its feed, the carriage I is weighted, and, engaging, as it does, through the pulleys *p'* with the bight or loop of the fabric depending between the pulleys *p p*, it will rise or fall vertically on its ways as the fabric tightens or slackens. The fabric may also be at the same time fed through the machine from a receptacle placed outside the machine, in which case it would run over the pivoted lever N and its friction-pins and guide to the pulley *p*, from which its course through the machine would be the same as that above described of the fabric taken from the beam X.

The counting and registering mechanisms are mounted upon the standard 19 and are readable through openings *o o o* in the face of the banjo or cover 20.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of means for measuring fabric, means for cutting the measured fabric into predetermined lengths, means for automatically registering the units of measurement of said fabric, means for automatically registering the linear length of fabric operated upon, means for feeding the fabric through the machine, means for regulating the tension on the fabric during its feed, means for maintaining uniformity of speed in the feeding mechanism with each other and with driving means for operating the whole.

2. The combination with a rotatable measuring-arm having a longitudinally-adjustable end, of pivoted clamping means, mounted upon said end, and arranged to be clamped automatically upon the fabric at a predetermined point in the revolution of said arm, and to be automatically released at another predetermined point in the revolution of said arm, means for actuating said clamping means, and means for rotating said arm.

3. The combination with a rotatable arm provided with a stationary end piece adapted to serve as one side of a shear, a pivoted blade arranged and adapted to constitute the movable half of such shear, said blade lying normally out of contact with said stationary part, means for moving said blade into cutting contact with said stationary side, and means for rotating said arm.

4. The combination of arms arranged diametrically opposite each other for synchronous rotation, pivoted clamping means carried on the end of each arm, means for actuating such clamping means on each half-revolution of said arm, a cutting-blade pivoted upon the end of each arm, means for actuating said cutting-blades at predetermined points in the revolution of said arm, and means for rotating said arm.

5. The combination of a revoluble wheel W, provided with peripheral serially-numbered teeth, a spring-controlled actuating-pawl W' normally held out of engagement with said teeth, means for causing said pawl to engage with said teeth successively, a spring-controlled holding-dog 6 normally held in engagement with the teeth of said wheel, means carried by said wheel for causing the disengagement of said dog at a predetermined point in the revolution of said wheel, other means carried by said wheel for causing said dog to reëngage said teeth on the reverse movement of said wheel, and means for causing reverse movement of said wheel.

6. The combination of the revoluble toothed wheel W, the arm 2 carried by said wheel and having the offset pawl 3, the spring-controlled rod 9, the crank-shaft 10 provided with an arm 11, operatively connected with said rod, and a slidable bolt S, and with means for revolving said wheel.

7. The combination of a revoluble wheel W, means for rotating said wheel in one direction, other means for reversing the movement of said wheel, an arm W^2 carried by said wheel and projecting beyond the perimeter thereof, a pivoted spring-controlled holding-dog 6, a pivoted holding-latch 5, and a spring 7 having a weakened central cross-section and adapted by the engagement of its free end with said arm W^2 to prevent rebound of the wheel W, and to yield, on the direct revolution of said wheel to release said arm W^2.

8. The combination of the cone-pulleys C, C', the belt *e*, and means for driving the same, the carriage H, slidable upon ways H', H^2, H^4, H^3, carrying the guide-rolls, *d'*, *d*, the pawls d^4, d^5, slidable on said ways, the shipping-rods, d^2, d^3, pivoted on said pawls, adjustable stops s^2, s^3, s^4, *s'*, the endless chain d^6, the pulley d^7, the sprocket-wheel, d^8, operatively connected with the shaft of the cone-pulley C, the weighted carriage I, arranged for vertical movement in either direction to actuate the rods d^2, d^3, and means for supporting the whole.

9. The combination with the frame of a machine for measuring fabric of an adjustable arm, N, provided with friction-pins, *n*,

n, *n*, at near its lower end, adapted to maintain tension on the fabric in its feed movement, and with a laterally-adjustable guiding-arm, *n'*, at its upper end, a set-screw, n^2, adapted to bind said guiding-arm in its adjusted position, and a bolt, as n^3, adapted to normally hold said arm, N, rigid, and to be temporarily slackened to permit said arm, N, to be moved pivotally thereon for purposes of adjustment.

10. In a machine for measuring fabric the combination of a standard, A', flange-pulleys, *p*, *p*, mounted on said standard, guides, *i*, *i'*, mounted on said standard parallel with the same and with each other, and a weighted carriage, I, slidable on said guides, and carrying a flange-pulley *p'*, adapted to engage with a loop of fabric between the pulleys, *p*, *p*, and by its sliding movement to maintain a uniform strain on the fabric during its passage through the machine.

In testimony whereof I have hereunto signed my name in presence of two subscribing witnesses.

WILLIAM C. PERRY.

Witnesses:

HENRY MARSH, Jr.,

W. FULLERTON BLAINE.