No. 630,853. Patented Aug. 15, 1899.

C. C. BREUSCHER.

TRIPPING MECHANISM FOR GRAIN BINDERS.

(Application filed Apr. 27, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

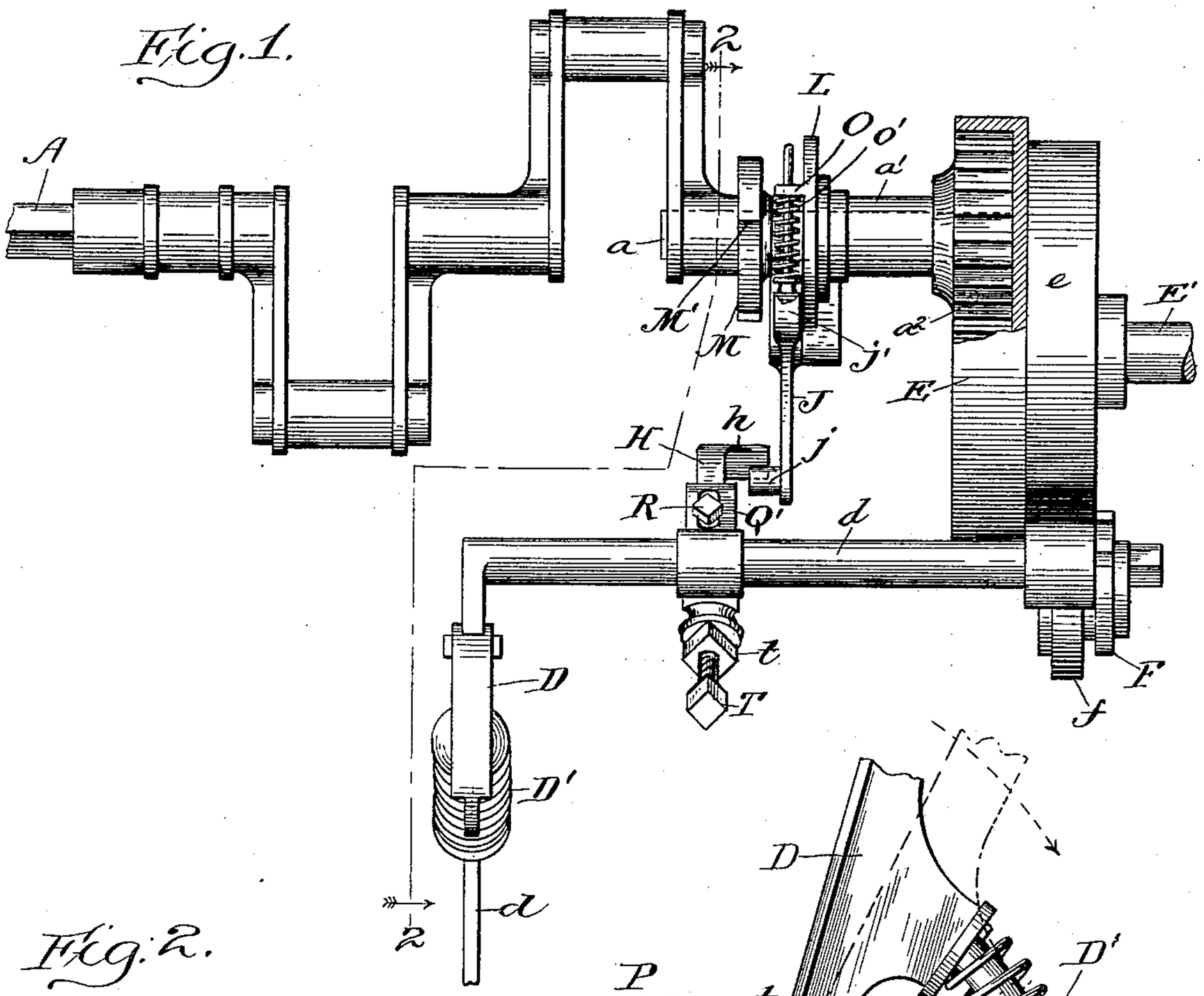

Fig. 2.

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No. 630,853. Patented Aug. 15, 1899.

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(Application filed Apr. 27, 1898.)

(No Model.) 3 Sheets—Sheet 2.

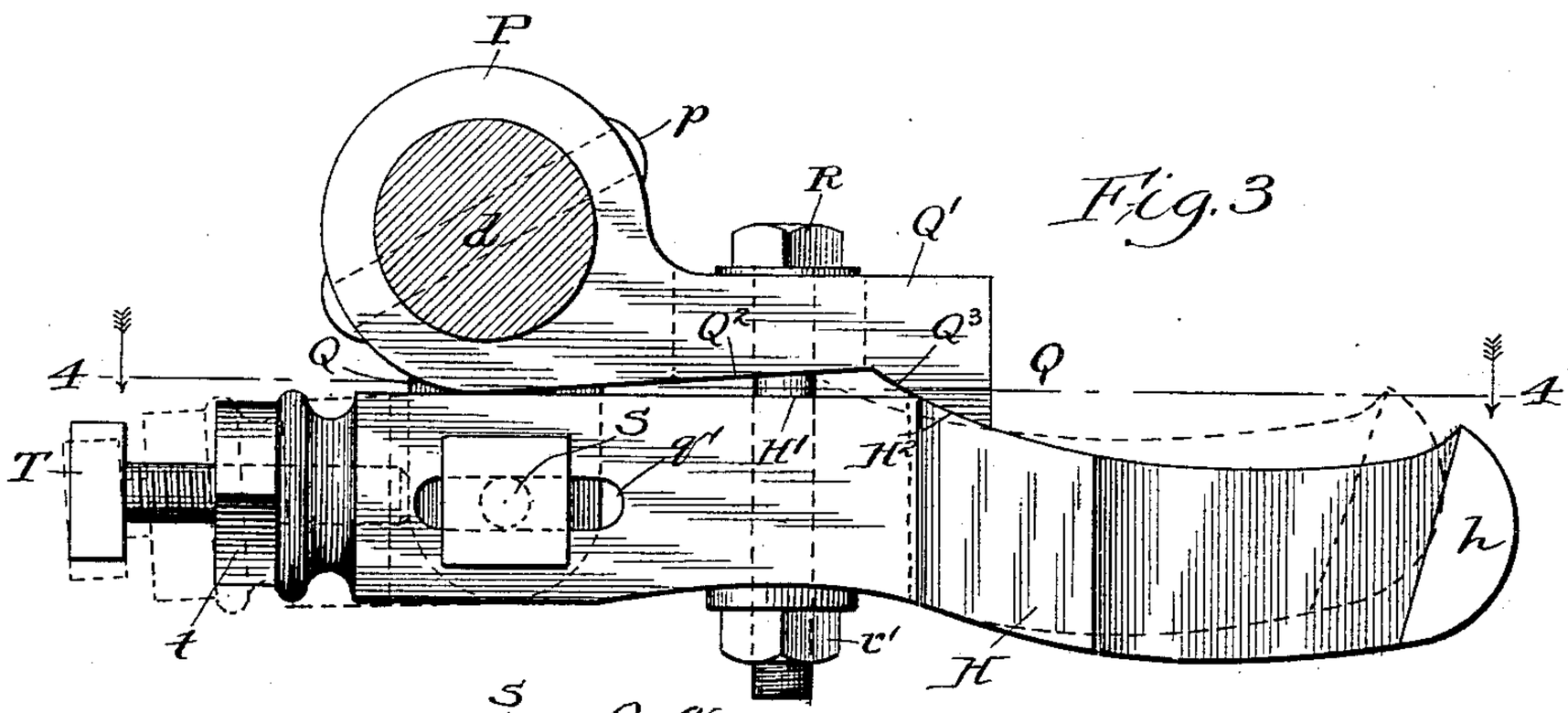

Fig. 3

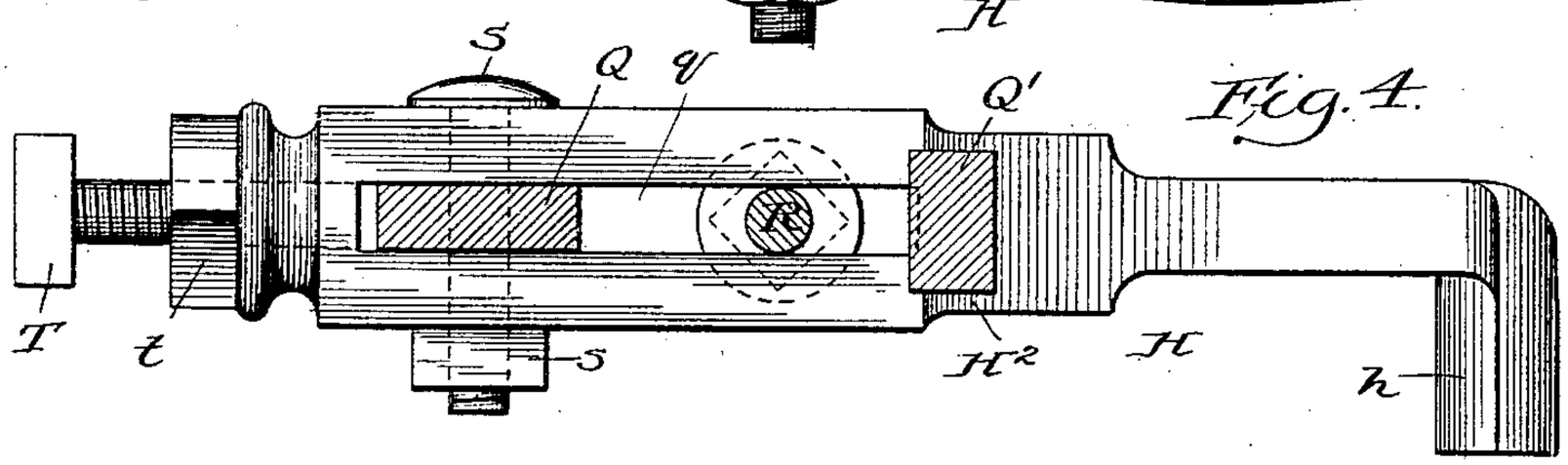

Fig. 4.

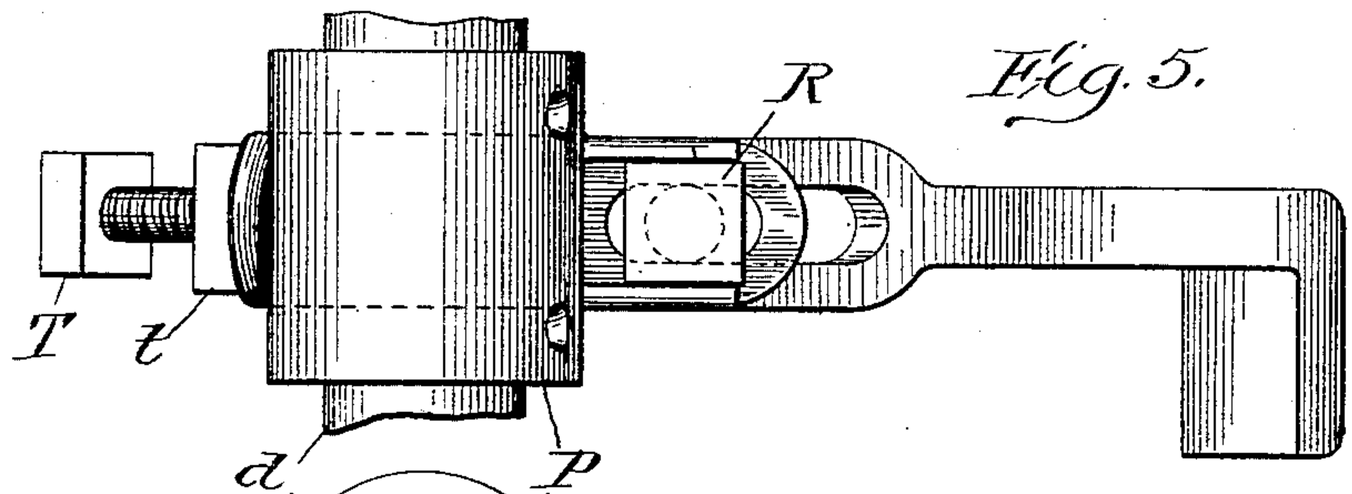

Fig. 5.

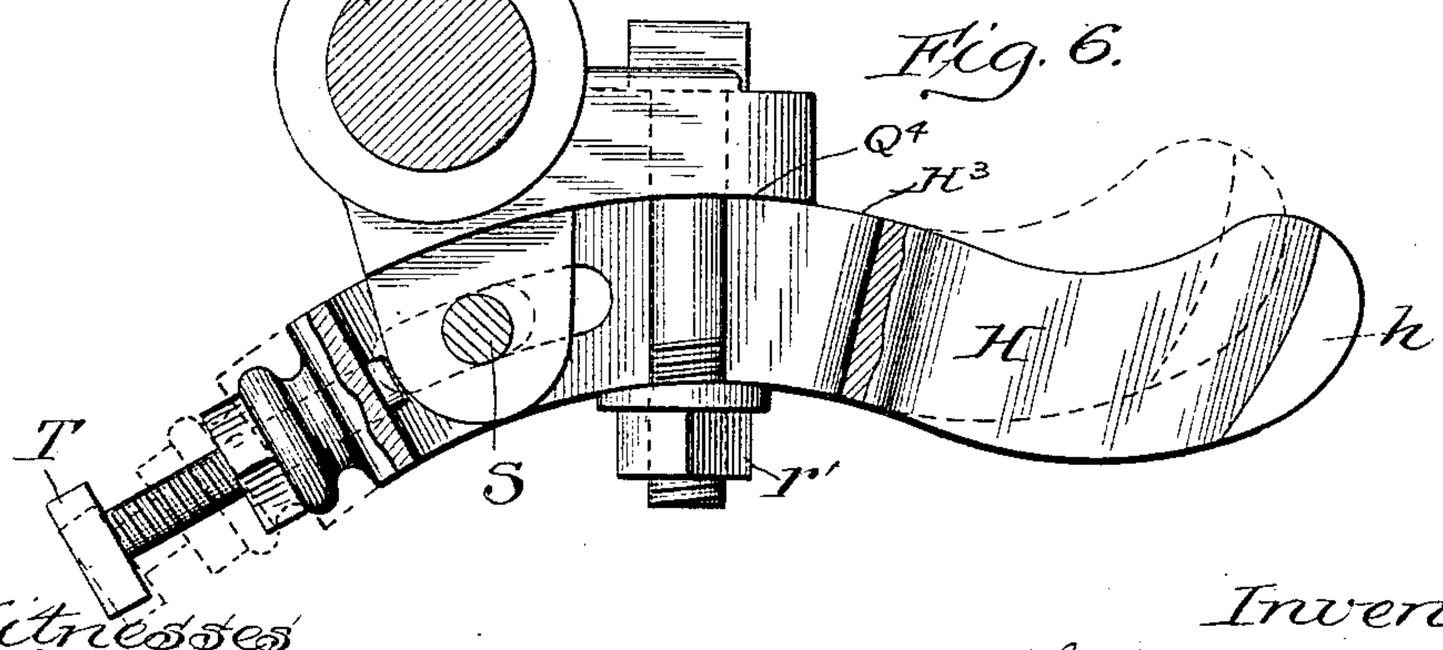

Fig. 6.

Witnesses
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No. 630,853. Patented Aug. 15, 1899.

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TRIPPING MECHANISM FOR GRAIN BINDERS.

(Application filed Apr. 27, 1898.)

(No Model.) 3 Sheets—Sheet 3.

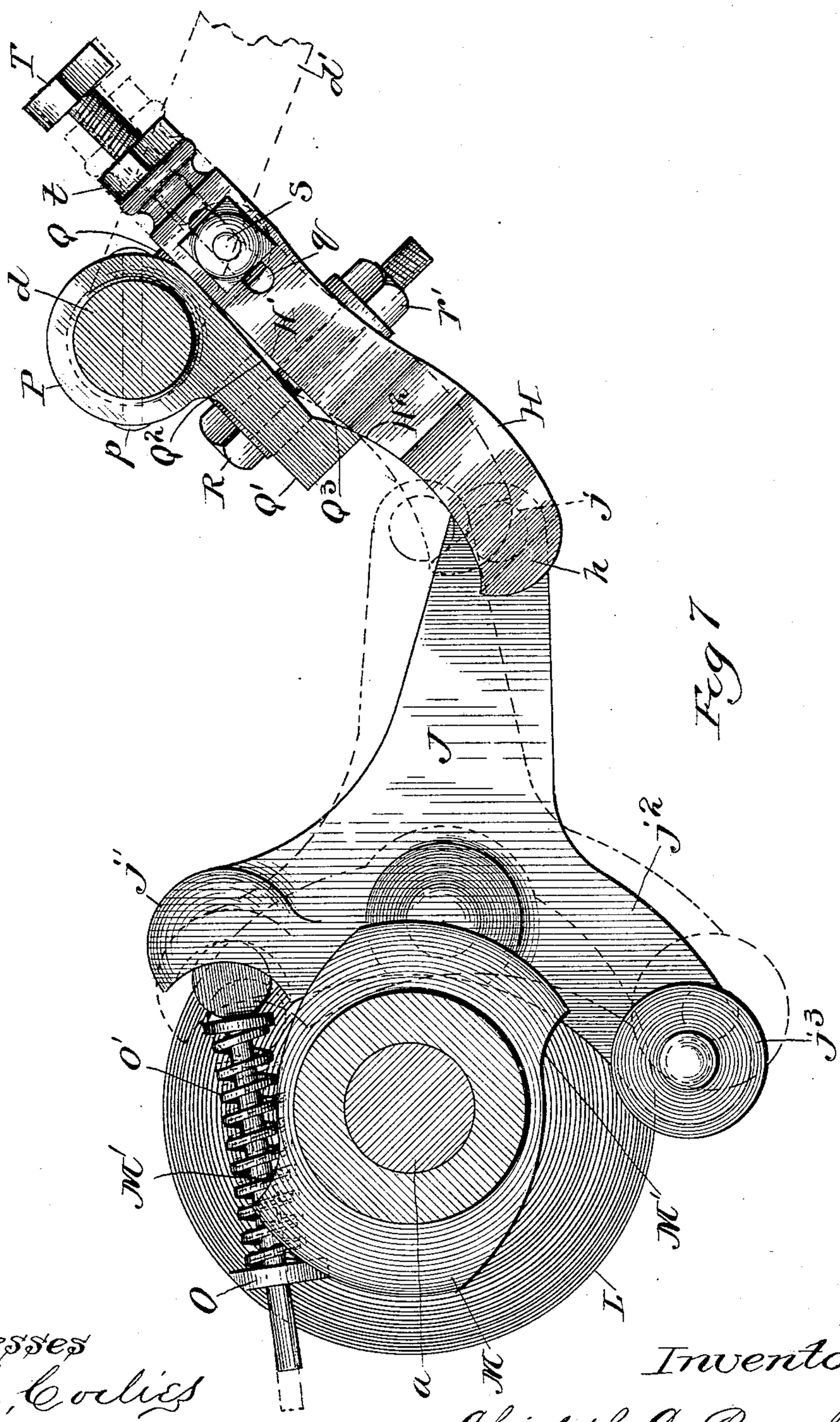

Fig 1.

Witnesses
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UNITED STATES PATENT OFFICE.

CHRISTOPH C. BREUSCHER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE PLANO MANUFACTURING COMPANY, OF SAME PLACE.

TRIPPING MECHANISM FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 630,853, dated August 15, 1899.

Application filed April 27, 1898. Serial No. 678,961. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPH C. BREUSCHER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tripping Mechanism for Grain-Binders, of which the following is a specification.

My invention relates to certain improvements in tripping mechanisms for grain-binders, and especially to that class of tripping mechanisms in which a clutch is employed to connect the continuously-rotating packer-shaft with the intermittently-rotating binding mechanism. This clutch is controlled by the presser-arm, against which the forming gavel is compressed until the pressure of the gavel serves to operate the clutch mechanism and cause the binding mechanism to come into operation and bind the gavel.

My invention relates more specifically to the trip-stop, which is mounted upon the trip rock-shaft carrying the presser-arm and which coöperates with the trip-arm upon the aforesaid clutch and is concerned mainly with making said trip-stop adjustable in two directions—*i. e.*, longitudinally and vertically.

My invention is an improvement upon that shown in my application for a patent, Serial No. 660,942, filed December 6, 1897. In the description and drawings I have shown and described only so much of the mechanism as is necessary to make a disclosure of the operation of my improvements, the general construction and operation of these tripping mechanisms being well known to those skilled in the art.

In the accompanying sheets of drawings, in which the same letters of reference are used to designate identical parts in all the views, Figure 1 is a plan view of a portion of the binding mechanism with some of the parts omitted and with others broken away. Fig. 2 is a side elevation of the same mechanism in section on the line 2 2 of Fig. 1, with some of the parts omitted to more clearly disclose the construction. Figs. 3 and 4 are a side elevation and plan view, respectively, of the trip-stop proper, showing the adjustments. Figs. 5 and 6 are similar views of a preferred form of the trip-stop; and Fig. 7 is a view similar to Fig. 2, but on a larger scale and with a different adjustment shown in the dotted-line position.

A is the continuously-rotating packer-shaft, which terminates at its right in the bearing-rod *a*, which is rigidly fastened to and rotates with said packer-shaft. This shaft carries the clutch-block M, which is of the shape shown in Fig. 2, and the primary features of which are the oppositely-disposed shoulders M′, with which the clutch member (generally designated by the letter J) engages to connect the clutch-plate L with the clutch-block M. This clutch-plate L on which the clutch member J is pivotally mounted is fastened to the left-hand end of the sleeve *a′*, mounted upon the bearing-rod *a*. The right-hand end of this sleeve *a′* carries the gear-pinion a^2, which meshes with the internally-toothed gear-wheel E, rigidly mounted upon the binder drive-shaft E′. This wheel or disk E carries upon its right-hand face the guide or controlling flange *e*, with which coöperates the friction-roller *f*, carried by the crank-arm F, rigidly mounted upon the trip rock-shaft *d*, which is suitably journaled in bearings and extends parallel to the shaft A. In addition to the crank-arm F, mounted upon its right-hand end, this trip rock-shaft D has rigidly fastened to its left-hand end the crank-arm *d′*, to which is pivotally attached the arm D, which is mounted, as seen, so as to be capable of swinging very slightly against the stress of the strong coiled spring D′ without affecting the crank-arm *d′*, and thereby rocking the trip rock-shaft *d*. Upon this same shaft *d* and between the crank-arms *d′* and F is mounted the trip-stop H, which is substantially in the plane of the clutch member J, with which it coöperates. At its outer end this trip-stop H has a lug *h*, projecting into the plane of the lug *j*, which is customarily in the form of an antifriction-roller, carried by the straight arm of the clutch member J. This clutch member comprises also the arm j^2, carrying the antifriction-roller j^3, which cooperates with the shoulders M′ on the clutch-block M. The third arm *j′* of the clutch member J has interposed between it and the lug O upon the clutch-plate L an expansion-spring *o′*, suitably secured between said parts and

tending to hold the antifriction-roller j^3 in engagement with one of the shoulders M′ on the clutch-block M, so that the sleeve a' shall be engaged to the packer-shaft A, so as to rotate therewith. When the antifriction-roller j is engaged by the lug h, as set out below, the clutch member J is rocked, so as to disengage the antifriction-roller j^3 from the shoulders of the clutch-block M, and thereby the sleeve a' is unclutched from the packer-shaft A and held from rotation.

As previously constructed prior to my invention, especially as shown in my application Serial No. 660,942, above referred to, the trip-stop H has been made adjustable about the shaft d, so as to be capable of angular movement relative thereto and, so far as the operative position of the stop is concerned, capable of what may be termed "vertical" adjustment. In the operation of the device, as set out below, there is a considerable amount of hammering and friction between the lugs h and j, so that in course of time, owing to the natural wear of the parts and other causes, the relative positions of the lugs h and j, which depend upon the relations of a number of mechanisms, are likely to vary, and as a consequence the trip-stop fails to act in the desired manner. In order to overcome this difficulty, the adjustment of the trip-stop shown in my aforesaid application was made; but, as before stated, owing to the form of mounting employed it was only capable of angular movement about the shaft d, or what may be called a "vertical" adjustment. In order to enable me to get a perfect adjustment of the trip-stop, it is necessary to provide means for what may be called a "longitudinal" adjustment—that is, an adjustment whereby the distance of the lug h from the shaft d may be changed as may be necessary to secure the required operative relation between the lugs h and j. While I might make these two adjustments separate and independent—*i. e.*, construct the trip-stop so as to be capable of a vertical adjustment independent of any longitudinal adjustment or of a longitudinal adjustment independent of any vertical adjustment—I prefer to so construct the adjustments that as the trip-stop is adjusted longitudinally it shall at the same time be adjusted vertically, so as to keep the lugs h and j in their proper relative operative positions. To secure this mode of operation, I employ the constructions to be described.

Referring especially to Figs. 3 and 4, I secure to the shaft d a hub P integral therewith or fixed thereto by any suitable means, as by a rivet p. The hub P is provided with two lugs Q and Q′, arranged at substantially right angles to each other. The trip-stop H is formed with a longitudinal slot q, adapted to receive the lug Q and also a bolt R, which passes through a suitable aperture in the lug Q′. The lug Q is apertured to receive a bolt S, which passes through a second longitudinal slot q' in the stop H, the bolt S carrying a nut s, by which the trip-stop may be secured in any desired position. The adjusting-screw T is set in the rearward end of the trip-arm H, extending through the arm and into the slot q, so that it may bear against the lug Q. A jam-nut t, mounted upon the bolt T, serves to effectually lock this bolt against rotation. A nut r', carried upon the end of the bolt R, binds the trip-stop H against the lug Q′, and thereby prevents its vertical displacement. The vertical adjustment of the trip-stop H in connection with its longitudinal adjustment is secured by means of forming on the under surface of the lug Q′ the two surfaces Q^2 and Q^3, which are inclined to each other so as to form a reëntrant angle at the point of their intersection, and which coöperates with the surfaces H′ and H^2 formed on the upper side of the trip-stop H, and which in their intersection form an obtuse angle which is substantially complemental to the reëntrant angle formed on the under surface of the lug Q′. From the full and dotted line positions shown in Fig. 3 it will be seen that as the trip-stop H is adjusted longitudinally it will be given a certain vertical adjustment, and vice versa, the adjusting-surfaces being so arranged as to simultaneously furnish the exact vertical adjustment which is essential to the change in the position of the lug h made by the longitudinal adjustment.

In Figs. 5 and 6 I show a preferred form of bearing-surfaces between the lug Q′ and the trip-stop H, the change being that in place of having the two angularly-disposed bearing-surfaces on each member I increase these bearing-surfaces to an infinite number, so as to produce the complemental curves Q^4 and H^3, which, as will be readily seen, operate on exactly the same principle as do the bearing-surfaces of the construction shown in Figs. 3 and 4, and these curves, the same as the angularly-disposed surfaces, can readily be designed so as to simultaneously secure the relative vertical adjustment necessary in connection with any longitudinal adjustment to maintain the lug h in its proper operative position relative to the lug or antifriction-roller j.

In the operation of my improved tripping mechanism the normal position of the parts is with the antifriction-roller f resting against the hook e^6 of the piece e^4, which is pivoted to the under surface of the flange E, as at e^5, and which is normally held outward by the compression-spring e^7, carried upon and secured by the bolt e^8, fastened to the flange e. These parts last referred to are conveniently shown in Fig. 2 in dotted lines. In this position of the controlling crank-arm F the lug h of the trip-stop H is directly in the path of the lug j of the clutch member, and the engagement of these lugs h and j serves to hold the antifriction-roller j^3 out of engagement with the shoulders M′ of the clutch-block M, and thus the sleeve a' is held from rotation with the packer-shaft A, and the wheel or disk E and its binding-shaft E′ are held motionless. The pres-

sure of the forming gavel is transmitted to the presser-arm D, and when the gavel is sufficiently large the pressure thereof overcomes the resistance of the spring e^7, and the hook e^6 yielding inward the controlling crank-arm F is also permitted to swing inward, and its movement rocks the shaft d until the trip-stop H is moved sufficiently to disengage its lug h from the lug j of the clutch member. As soon as this disengagement is effected the spring o' throws the clutch member so as to connect the clutch-block M and the clutch-plate L, and the wheel or disk is rotated by the ensuing rotation of the sleeve a'. In the construction shown it requires three rotations of the gear-pinion a^2 to rotate the disk E once, and during the first two rotations of the pinion a^2 or the first two-thirds of the rotation of the disk E the pressure of the gavel holds the antifriction-roller f upon the flange e, thus holding the lug h of the trip-stop H out of the path of the lug j of the clutch member J, this position being shown in the dotted-line position of the trip-stop in Fig. 2. During the third rotation of the pinion a^2, the flange e not being present at the portion of the periphery of the wheel adjacent to the antifriction-wheel f at this period, the gavel, which has been bound, is discharged, the absence of the flange e at this point permitting the controlling crank-arm F to swing inwardly to allow the presser-arm D to swing down to permit the discharge of the gavel. At the close of the complete revolution of the disk E the antifriction-roller f of the controlling crank-arm is engaged by the hook e^6 of the flange E, and the trip rock-shaft d and its associated parts are once more swung into their normal position, in which the lug h, being in the path of the lug j, serves to disconnect the clutch and stop the operation of the binding mechanism until another gavel is formed.

It will be understood that my invention is capable of some modifications, and that I do not desire to be limited to the exact structure shown and described; but

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a grain-binder, the combination with the binding mechanism, of a drive-shaft, a clutch for engaging the binder mechanism with the drive-shaft normally in engagement, a longitudinally-adjustable trip-stop so disposed as to normally disengage the clutch, and mechanism for yieldingly receiving the pressure of the forming gavel, such gavel-receiving mechanism and the trip-stop being so connected that the yielding of the former disconnects the latter from the clutch.

2. In a grain-binder, the combination with the binder mechanism, of a drive-shaft, a clutch for engaging the drive-shaft with the binder mechanism, a yielding trip-arm for receiving the pressure of the forming gavel, a rock-shaft for carrying the trip-arm, and a longitudinally-adjustable trip-stop fixed to the rock-shaft and being so disposed as to disengage the clutch while the gavel is accumulating, and to be thrown out of connection therewith as the trip-arm yields to the pressure of the gavel.

3. In a grain-binder, the combination with the binder mechanism, a drive-shaft, a clutch for connecting the binder mechanism with the drive-shaft, and a trip for automatically disengaging the clutch and comprising a rock-shaft, an arm carried by the rock-shaft for receiving the pressure of the forming gavel and a spring to resist such pressure, of an arm for controlling the clutch and having a lateral stud at its end, and a longitudinally-adjustable trip-arm secured to the rock-shaft and having a lateral stud at its end, said trip-arm being so held by the shaft while the gavel is forming that its lateral stud intercepts the lateral stud of the clutch-controlling arm to disengage the clutch.

4. In a grain-binder, the combination with the binder mechanism, of a drive-shaft, a clutch for engaging the binder mechanism with the drive-shaft normally in engagement, a longitudinally and simultaneously vertically adjustable trip-stop so disposed as to normally disengage the clutch, and mechanism for yieldingly receiving the pressure of the forming gavel, such gavel-receiving mechanism and the trip-stop being so connected that the yielding of the former disconnects the latter from the clutch.

5. In a grain-binder, the combination with the binder mechanism, of a drive-shaft, a clutch for engaging the drive-shaft with the binder mechanism, a yielding trip-arm for receiving the pressure of the forming gavel, a rock-shaft for carrying the trip-arm, and a longitudinally and vertically adjustable trip-stop secured to the rock-shaft and being so disposed as to disengage the clutch while the gavel is accumulating, and to be thrown out of connection therewith as the trip-arm yields to the pressure of the gavel, the connections for adjusting said trip-stop securing its simultaneous vertical adjustment when it is adjusted longitudinally.

6. In a grain-binder, the combination with the binder mechanism, a drive-shaft, a clutch for connecting the binder mechanism with the drive-shaft, and a trip for automatically disengaging the clutch and comprising a rock-shaft, an arm carried by the rock-shaft for receiving the pressure of the forming gavel and a spring to resist such pressure, of an arm for controlling the clutch and having a lateral stud at its end, and a longitudinally and vertically adjustable trip-arm secured to the rock-shaft and having a lateral stud at its end, said trip-arm being so held by the shaft while the gavel is forming that its lateral stud intercepts the lateral stud of the clutch-controlling arm to disengage the clutch, the connections for adjusting said trip-stop securing its simultaneous vertical adjustment when it is adjusted longitudinally.

7. In a grain-binder, the combination with

the binder mechanism, of a drive-shaft, a clutch for engaging the binder-shaft with the drive-shaft normally in engagement, an adjustable trip-stop so disposed as to normally disengage the clutch, means for adjusting said trip-stop vertically when it is adjusted longitudinally and vice versa, and mechanism for yieldingly receiving the pressure of the forming gavel, such gavel-receiving mechanism and the trip-stop being so connected that the yielding of the former disconnects the latter from the clutch.

8. In a grain-binder, the combination with the binder mechanism, of a drive-shaft, a clutch for engaging the drive-shaft with the binder mechanism, a yielding trip-arm for receiving the pressure of the forming gavel, a rock-shaft for carrying the trip-arm, an adjustable trip-stop secured to the rock-shaft and so disposed as to disengage the clutch while the gavel is accumulating, and to be thrown out of connection therewith as the trip-arm yields to the pressure of the gavel, and the coöperating bearing-surfaces between said rock-shaft and trip-stop arranged to adjust said trip-stop vertically when it is adjusted longitudinally and vice versa.

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