

(No Model.)

E. W. ROSS.
FEED CUTTER.

No. 460,269.

Patented Sept. 29, 1891.

Fig. 1.

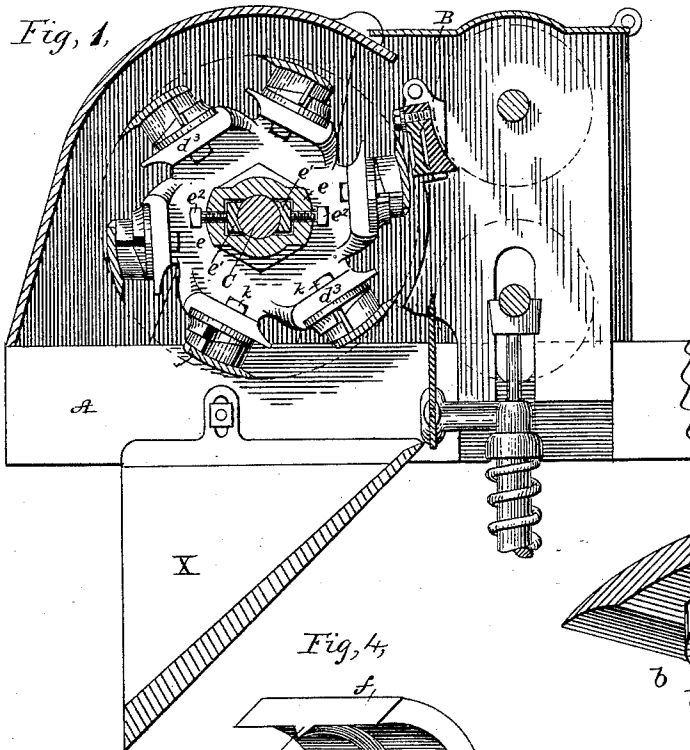


Fig. 4.

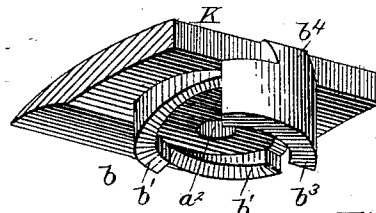
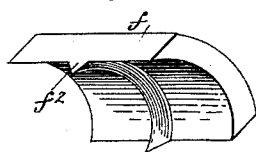


Fig. 3

Fig. 2.

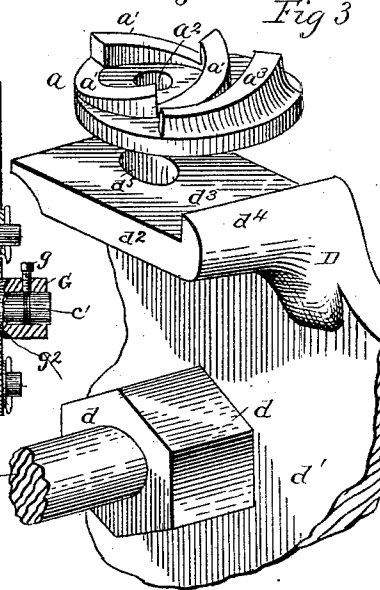
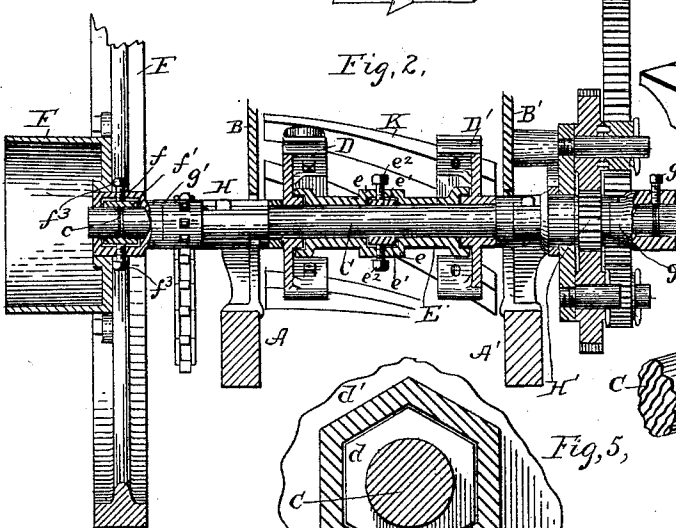


Fig. 5.

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UNITED STATES PATENT OFFICE.

ELMORE W. ROSS, OF SPRINGFIELD, OHIO.

FEED-CUTTER.

SPECIFICATION forming part of Letters Patent No. 460,269, dated September 29, 1891.

Application filed November 4, 1889. Serial No. 329,128. (No model.)

To all whom it may concern:

Be it known that I, ELMORE W. ROSS, a citizen of the United States, and a resident of Springfield, county of Clark, and State of Ohio, have invented a new and useful Improvement in Feed-Cutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to the construction of the cutting-cylinder and to the manner of connecting the same with its driving-shaft, to the means for effecting the adjustment of the knives on the cylinder and for properly supporting them against the backward thrust of the cutting action, and to the manner of connecting the driving or band and fly wheels and driving sprocket-wheels with the main driving-shaft, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section through the cutting-cylinder, stationary knife-bar, &c. Fig. 2 represents a vertical transverse section through the same. Fig. 3 is a perspective view showing in detail the knife-adjusting blocks and portions of a knife and knife-head. Fig. 4 is a perspective view of one of the ribbed bearing-plates for connecting the driving and fly wheel with the driving-shaft, and Fig. 5 is an inner face view of the polygonal hubs of the knife-head with the hub of the connecting-sleeve and the driving-shaft in section.

A A' indicate portions of the machine framework, which may be of any suitable construction; B and B', the side plates thereof, and C the main driving-shaft of the machine mounted in suitable bearings on the side plates or frame.

D and D' indicate the cutter-cylinder heads, composed each of a central hub *d*, arms or a web *d'*, extending from said hub, and a flanged peripheral rim *d²*, which rims are preferably set facing inward toward each other. The hubs are made, preferably, polygonal in form, as shown in Figs. 3 and 5, on their inner ends to engage the enlarged correspondingly-shaped ends of an interposed connecting-sleeve E on the shaft C, and are free to turn

on said shaft, except as they are connected to each other and to the shaft by said sleeve. The sleeve is provided centrally of its length with hollow enlargements *e* on its sides (see Figs. 1 and 2) to receive clamping-plates *e'*, similar to but preferably without the inner rib of the plate shown in Fig. 4, and are made to clamp the shaft C between them for holding the sleeve E and heads D and D' united to and causing them to rotate with the shaft by means of set-screws *e²*, passing through the walls of the enlargements *e*, and by the proper adjustment of which the plates *e'* may be made to grasp and hold the shaft as firmly as required, thereby uniting the sleeve and knife-cylinder heads to the shaft.

The band-wheel F is secured to the fly-wheel F', and the latter is provided with a hub having hollow enlargements on its sides at *f* (similar to those *e* of the sleeve E) to receive clamping-plates *f'*, one of which is shown detached in Fig. 4, provided on their inner curved faces, which conform in curvature to the periphery of the shaft, with V-shaped ribs *f²*, which enter peripheral grooves *c* in the shaft near its end and prevent movement of the band and fly wheel endwise of the shaft. These plates *f'*, like the plates *e'*, are held in firm frictional contact with and made to grasp the shaft between them by means of set-screws *f²*. The shaft C has grooves *c* and *c'*, one near each end, adapted to the ribs *f²*, and by loosening the set-screws *f²* the band and fly wheel can be readily removed from one end of the shaft and applied to the other end, according to which is more convenient to the power to be applied and the work to be done.

Upon the opposite end of the shaft to that carrying the band and fly wheel is secured a sleeve or collar G by means of a set-screw entering the groove *c'* or *c*, as the case may be. The hub of the band and fly wheel and the collar G have on their inner ends each a clutch-face (indicated at *g'* *g²*, Fig. 2) to engage one a corresponding clutch-face on the hub of a sprocket-wheel H for actuating the latter, from which motion is communicated to an endless carrier, and the other to engage a similar clutch-face on a pinion H', actuat-

ing said pinion, from which motion is communicated to the feed-rolls, (indicated in dotted lines in Fig. 1,) said sprocket-wheel and pinion being loose on the shaft except as they are 5 clutched thereto, as described.

The peripheral flanges or rims of the cutter-cylinder are provided with segmental depressions or flat places d^3 , giving to the heads a polygonal form, the flat places forming 10 seats for the knife-blocks or cam-plates and having heel projections d^4 , against which said blocks abut and which prevent their being thrust backward relative to the movement of the knife-heads under the action or blows to 15 which the knives are subjected. The knife cam-blocks are formed each in two parts a and b , (shown separated in Fig. 3,) each in the form of a disk having ratchet-shaped teeth or inclined planes a' or b' , curved in arcs of 20 circles concentric to a central perforation a^2 , through which and perforations in the knife K and knife-head flange or rim d^2 a bolt k passes for securing the knife and knife-blocks to said head. The teeth or inclines b' of the part b 25 match those of the part a and ride up or down thereon for adjusting the knife outward from or inward toward the knife-head. The blocks or plates a and b are both eccentric in form or cam-shaped relative to the bolt-holes a^2 , so that 30 as the block a is turned in its seat d^3 it bears against the heel projection d^4 and serves to move the bolt k and knife K forward or backward relatively to the heel d^4 , and thereby to move the knife tangentially on the knife-head. The perforations d^5 in the rim d^2 of 35 the knife-head are elongated peripherally or made in the form of slots to permit this movement of the bolts, cam-blocks, and knives. The block or plate a has an outwardly-projecting curved rib a^3 on its cam-shaped rear portion, and the part b has a similar inwardly-projecting rib b^3 , which lies in front of the rib a^3 , between the latter and the 40 adjacent tooth or incline a' of the block or plate a , for preventing back-thrust of the plate b . The plate or block has also an outwardly-projecting rib or spur b^4 , against which the back of the knife K abuts for preventing backward thrust or movement of the latter, 45 in a manner that will be readily understood. The knife is secured to its seat d^3 by a single through-bolt, the slot in said seat permitting a forward and backward movement of the bolt, and when the bolt is loosened for the purpose and the cam-block is turned slightly to 50 the right, as in tightening a nut, it serves by means of its inclined teeth to thrust the block b and the knife K outward, and vice versa, and at the same time by the action of the cam-plate a in being rotated in its seat the bolt is moved forward or backward in its slot d^5 , moving the knife with it tangentially to the knife-head, and thereby increasing the efficiency of the knife-blocks in effecting the desired adjustment of the knives. 60

L indicates the yielding feed-roll guard or

fender, M the stationary knife-bar, and X the adjustable discharge-spout, said parts, with others not specifically described, being constructed and arranged preferably as described in another application referred to of 70 even date herewith or in any usual or preferred manner.

By uniting the knife-cylinder heads and the driving and fly wheels to the knife-shaft with a frictional grasp, as described, it will be seen 75 that if any hard foreign substance, such as the knives could not readily cut and which would be liable to break the machine, is accidentally brought to the action of the knives 80 the comparatively slight frictional grasp of the knife-cylinder on its driving-shaft and of the latter upon its driving and fly wheel (either or both) serve to free the knife-cylinder from its driving mechanism and allow it 85 to stop until the obstacle is removed much more easily and quickly than where the momentum of the heavy driving mechanism is inseparably connected with it.

Having now described my invention, I 90 claim as new—

1. The combination, with the knife-cylinder shaft, of the knife-cylinder heads mounted loosely on said shaft, the interposed sleeve connecting said knife-heads, and means for 95 uniting the sleeve and knife-heads to the shaft with a releasable frictional grasp, substantially as described.

2. The knife-cylinder shaft having an annular peripheral groove and the wheel mounted thereon, in combination with the interposed friction-plate having a rib engaging the groove in the shaft, substantially as described. 100

3. The knife-cylinder shaft having an annular peripheral groove near each end, in combination with a wheel made reversible to either end of the shaft and provided with friction-plates having ribs for engaging either of said grooves, substantially as described. 105

4. The knife-cylinder shaft having an annular peripheral groove near each end, in combination with a wheel provided with friction-plates having ribs for engaging either of said grooves and a sleeve or collar having a 110 clutch-faced end, said wheel and sleeve being located at opposite ends of said shaft and made interchangeable thereon, substantially as described. 115

5. The main driving-shaft having the peripheral grooves c and c' , in combination with the wheel having the clutch-faced hub and the ribbed friction-plates for uniting it to said shaft, and the sleeve or collar also having a 120 clutch-faced end and made interchangeable with said wheel, substantially as described. 125

6. The main driving-shaft, in combination with a driving-wheel having a clutch-faced hub removably connected to said shaft, a sleeve or collar also having a clutch-faced 130 end also removably connected to said shaft and made interchangeable with said driving-

wheel, and a clutch-faced gear-wheel adapted to engage either said driving-wheel or sleeve, substantially as described.

7. In a cutter, the main driving-shaft carrying a clutch-faced gear and a clutch-faced sprocket-wheel, in combination with a driving-wheel having a clutch-hub for engaging either said gear or sprocket wheel, and a sleeve or collar also provided with a clutch-hub, said driving-wheel and sleeve being interchangeable to opposite sides of the cutter, substantially as and for the purpose set forth.

8. The knife-blocks, each having curved incline-faced teeth upon their adjacent sides and one of which is eccentric in form, in combination with the knife and knife-heads, and a pivotal through-bolt for uniting said knife and blocks to the knife-cylinder head and permitting axial movement of one relatively to the other, substantially as described.

9. The knife-cylinder head having peripheral seats with shoulders at their rear, inner, and outer knife-blocks, each having curved inclined clutch-faced teeth upon their adjacent sides, one of said blocks being made eccentric in form and abutting against the shoulder on the knife-head, in combination with the knife and a pivotal through-bolt for uniting said knife and blocks to the knife-

cylinder head and permitting the axial movement of the one relatively to the other, substantially as described.

10. The combination, with the knife and knife-heads, of the knife-blocks *a* and *b*, having ratchet-teeth or inclines matching one the other, with interlapping heel-ribs thereon, and a projecting rib or spur for the knife to abut against, and a through-bolt for securing the knife and knife-blocks to said knife-heads, substantially as described.

11. The knife-cylinder head provided with peripheral seats having heel projections, in combination with knife-blocks, one of which is eccentric in form and abuts against said knife-head projections, said knife-blocks having inclined faced teeth and interlapping ribs on their adjoining faces, and a knife and a single through-bolt uniting said knife and knife-blocks to the knife-head and permitting the pivotal adjustment of the knife-blocks, substantially as described.

In testimony whereof I have hereunto set my hand this 28th day of October, A. D. 1889.

ELMORE W. ROSS.

Witnesses:

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