Nov. 18, 1941. H. C. BEHRENS 2,262,913

CUTOFF DRIVE MECHANISM

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Fig. 1.

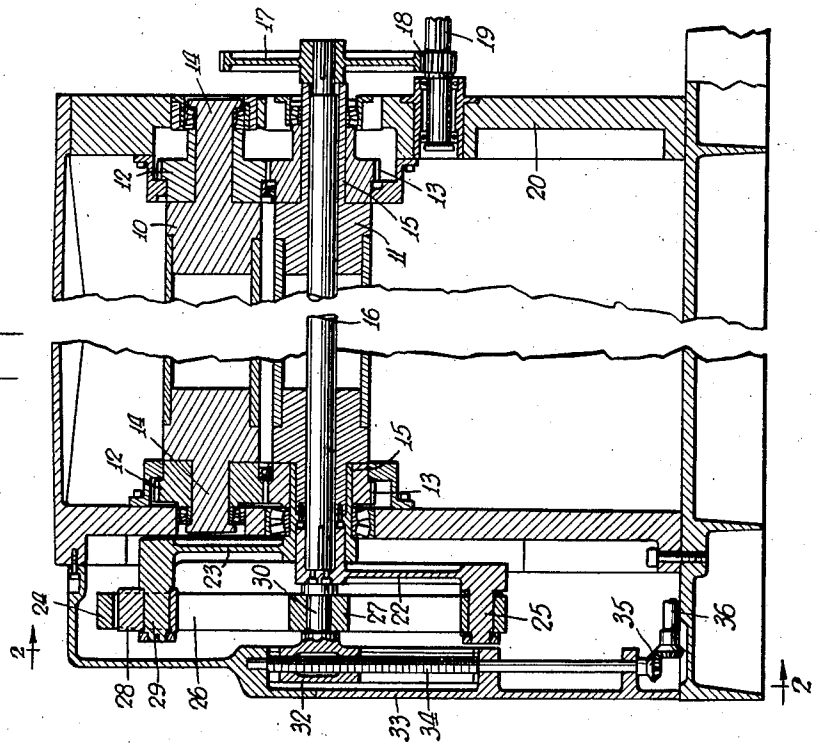
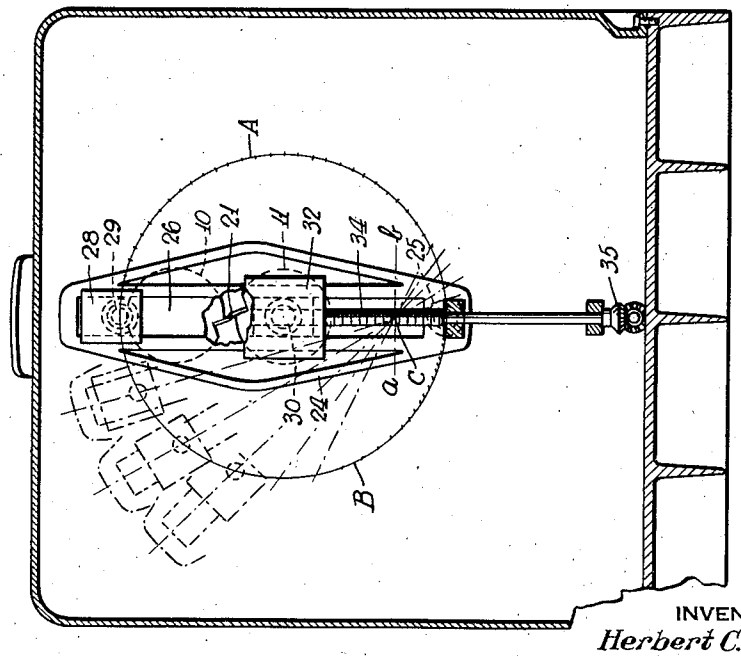


Fig. 2.



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Fig. 6.

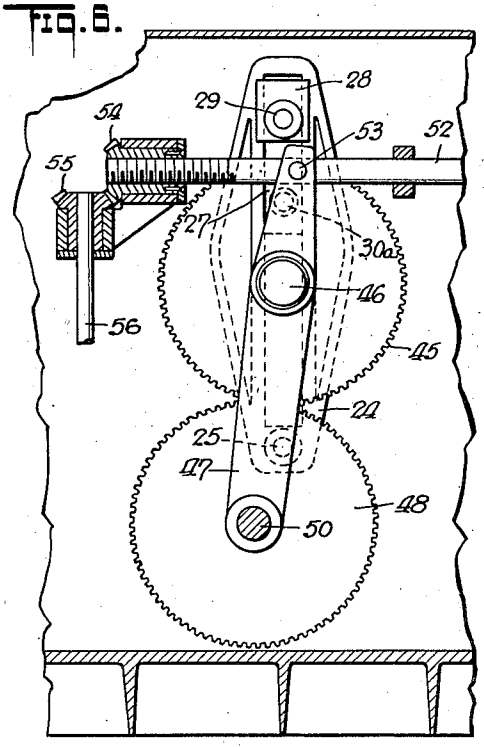


Fig. 5.

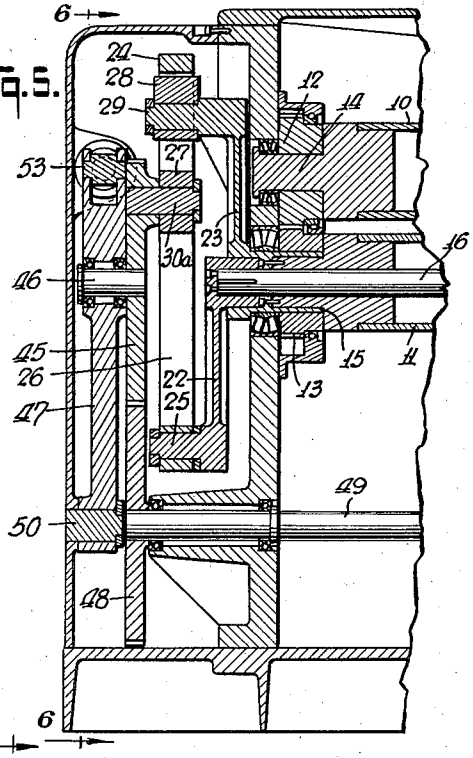


Fig. 4.

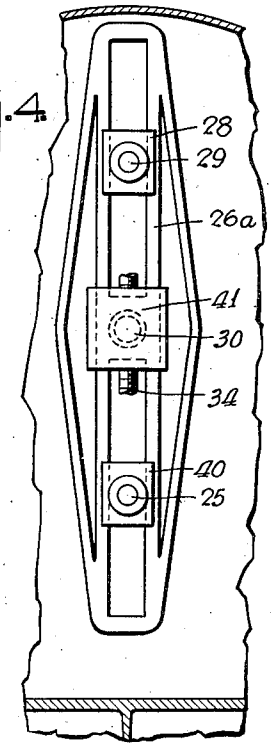
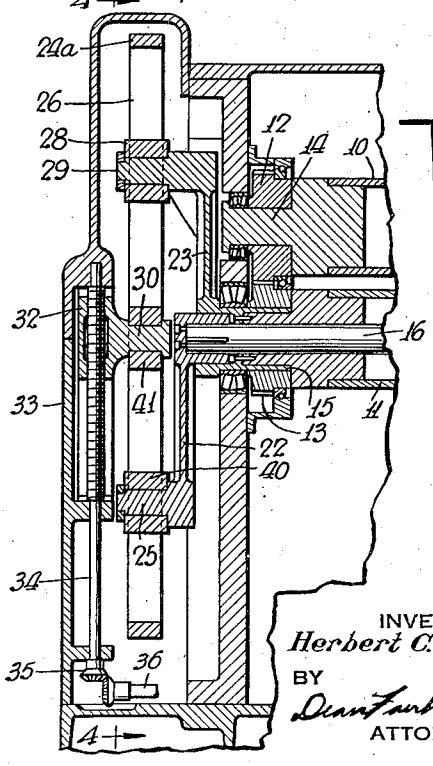


Fig. 3.



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CUTOFF DRIVE MECHANISM

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Fig. 7.

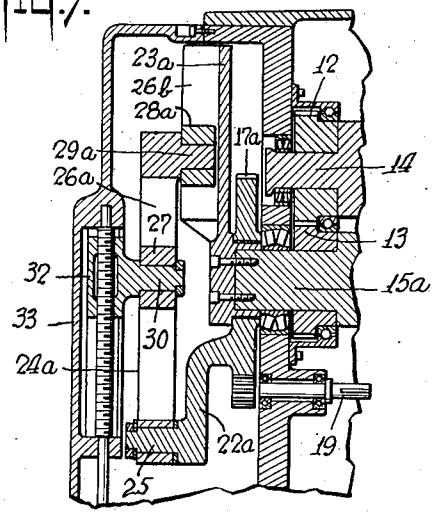


Fig. 8.

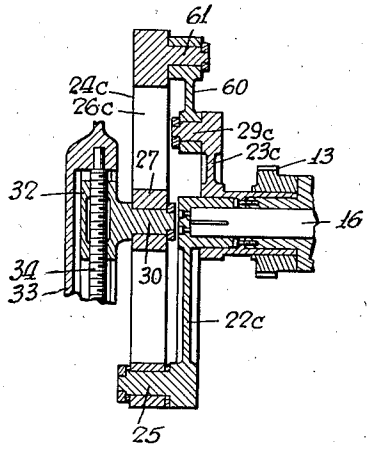


Fig. 9.

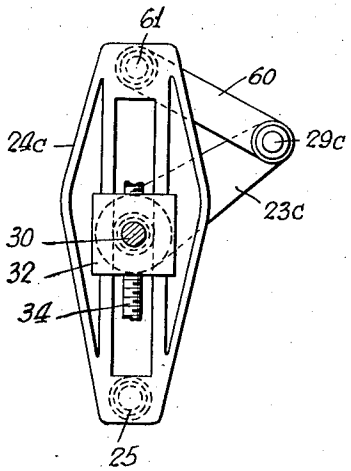
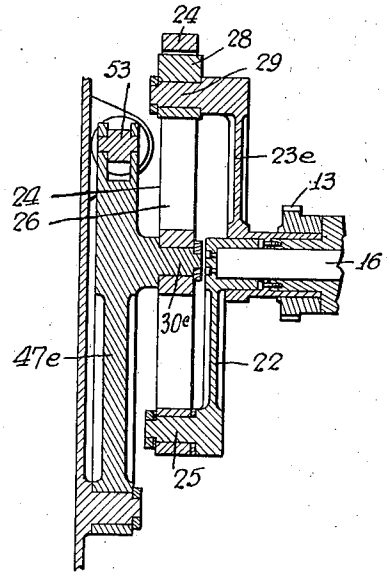


Fig. 10.



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UNITED STATES PATENT OFFICE

2,262,913

CUTOFF DRIVE MECHANISM

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Application August 2, 1940, Serial No. 349,811

21 Claims. (Cl. 164—66)

This invention relates to a mechanism of the rotary type for cutting into sections comparatively stiff continuously delivered material such as corrugated board, fibre board, sheets, rods, etc.

In order to cut off sections of a predetermined and uniform length from the material advancing at a uniform speed, it is necessary that the cutter have a time cycle corresponding to the length of the section and which must be changed for each desired length of section. It is also important that the speed of travel of the cutter at the instant of cutting be substantially the same as that of the material and regardless of the total time cycle of the cutter.

The present invention involves a new simplified, compact, and easily adjusted drive for the cutter for effecting the desired speed of cutter travel corresponding to the speed of travel of the material and in a wide range of total time cycles corresponding to different lengths of cut-off sections.

In carrying out my invention, I employ a lever element which is pivoted intermediate of its ends and has opposite end portions pivotally connected to the driving and driven elements so that with the pivotal centers of all three elements coaxial, the driven member will have the same angular velocity as the driving member in all portions of the rotational cycle. There are thus three pivotal centers, one for the driver, one for the driven element, and one for the lever arm; and also three pivotal connections, one between the lever arm and its support, one between one end of the lever arm and the driver, and one between the other end of the lever arm and the driven element.

As an important feature of my invention, I provide means for adjusting one of the pivotal centers in respect to one of the others as, for instance, that of the arm in respect to the center of the driven member so that the effective distances between the pivotal center of the arm and the pivotal connections of the arm to the driven member will vary during the rotation, and the angular velocity of the driven member will be alternately faster and slower than the angular velocity of the driving member in each time cycle. The difference between the fastest and slowest angular velocity is controlled by the extent of the displacement of the pivotal center of the arm in respect to the pivotal center of the driving and driven members. Two of the pivotal centers may be permanently coaxial and either this axis or that of the other member may be moved.

As a further feature, the direction of adjustment of the movable pivotal center is such with respect to the direction of travel of the material to be cut, that the maximum or minimum speed of the cutter will occur at approximately the instant the cutter is cutting on the sheet. Whether this be the maximum or the minimum will depend on whether the pivotal center of the lever arm be moved to one side of or to the other side of the center of the driving and driven members.

As the lever arm has three pivotal connections, one to the driving member, one to the driven member, and one to its pivotal support, and as the effective length of at least one end of the lever arm is continuously changing during each rotation, if the centers be relatively eccentric, it is essential that at least one of the pivotal connections be of the sliding type. In some forms of the invention, two of the pivotal connections must be slidable.

In the accompanying drawings, there are illustrated certain embodiments of my invention, but it will of course be understood that various changes in design and detail may be made within the scope of my invention.

In these drawings,

Fig. 1 is a central vertical section through one embodiment of my invention;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1;

Fig. 3 is a view similar to a portion of Fig. 1 but showing a further form;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a section similar to a portion of Fig. 1 and showing a further form;

Fig. 6 is a section on the line 6—6 of Fig. 5;

Fig. 7 is a section similar to a portion of Fig. 1 and in which certain alternative arrangements of the parts are shown;

Fig. 8 is a section of another modification of the form shown in Fig. 1 and in which a link connecting to crank pins is employed instead of a slide and groove connection;

Fig. 9 is an end view showing the arrangement of certain of the parts of Fig. 8; and

Fig. 10 is a section embodying a modification of the constructions shown in Figs. 4 and 6.

In the construction shown in Figs. 1 and 2, there are employed a pair of rotary cutter members 10 and 11 mounted for rotation about horizontal parallel axes and connected together at one or both ends by inter-meshing gears 12 and

13. One of the cutter members, for instance, the upper one may have the drum heads provided with solid shaft sections 14 while the other cutter member may have hollow shaft sections 15 through which a drive shaft 16 may extend. Power may be transmitted to the shaft 16 in any suitable manner as for instance, through a gear 17 meshing with a pinion 18 on a drive shaft 19 journaled in the frame member 20 and receiving power from a variable speed drive such as a Reeves drive. The two cutter members are provided with coacting cutter blades 21 indicated somewhat diagrammatically in Fig. 2, and which coact to cut into sections the sheet material passing between the cutter members as they rotate in opposite directions.

As an important feature of the invention, the shaft 16 is provided with a crank arm 22 and the cutter member 11 is provided with a crank arm 23, the two being adjacent to each other and movable in closely juxtaposed parallel planes. The crank arm 22 may have a hollow hub keyed on the shaft and the crank arm 23 may be made integral with or rigidly secured to the hollow shaft portion 15 of the cutter member 11. The shaft 16 and the cutter member 11 are relatively rotatable and the crank arms 22 and 23 may have relative angular movement about the same axis.

Motion is transmitted from the crank arm 22 to th crank arm 23 through a lever arm 24 pivoted intermediate of its ends. This lever arm has pivotal connections to each of the crank arms and to its pivotal support. At least one of these pivotal connections are of the slidable type to permit relative angular movement of the crank arms.

In the specific form shown in Figs. 1 and 2, the driving and driven elements are coaxial and the axis of the lever is movable and two sliding pivotal connections are provided. The lever 24 is journaled on the crank pin 25 of the crank arm 22 and has a slot 26 extending lengthwise thereof and in which is mounted a pair of slides 27 and 28. The slide 28 is journaled on the crank pin 29 of the crank arm 23 and the slide 27 is journaled on a stub shaft 30 and serving as the pivotal support about which the arm 24 swings. In the position shown in Fig. 1, the stub shaft is in axial alignment with the driving member 16 and driven cutter member 11. Means are provided for moving this stub shaft radially of the axis of said shaft. In the form illustrated, the slide 27 which is journaled on the stub shaft 30 has a cross head 32 mounted to slide in a stationary frame member or guide 33, extending along a diameter of the drum 11. It has a passage therethrough which is threaded on a screw shaft 34 so that the stub shaft may be moved vertically and in a radial direction in respect to the shaft 16.

The screw shaft 34 is normally stationary so as to hold the stub shaft 30 in a predetermined position, but any suitable means may be employed for rotating the shaft 34 to bring the stub shaft 30 to any degree of eccentricity in respect to said shaft 16. As shown, it has mitre gear connections 35 to a shaft 36 which may be interconnected with the operating mechanism of a Reeves drive for driving the shaft 19. Thus, when the Reeves drive is actuated to vary the total time cycle of the two cutters, the position of the stub shaft 30 which is the pivotal support of the lever 26 will be correspondingly adjusted to keep the cutter speed at the instant of cutting the same as the speed of sheet travel in spite of the change in total time cycle and corresponding change in the length of the sections being cut off.

In Fig. 2, there is shown in solid lines the position of the parts when the pivotal center of the lever arm is coaxial with the driving and driven cranks. In dotted lines the position of certain of the parts is indicated with the pivotal center of the lever arm in its lowest positions. The half circle A at the right hand side of Fig. 2 indicates the path of movement of the center of the driving crank pin 25 and this is divided into equal sections indicating the uniform angular velocity of said crank pin. The half circle B at the left of Fig. 2 indicates the path of movement of the axis of the driven crank pin 29 and this is divided into unequal sections indicating the relative anglar velocity of said crank pin 29 when the pivotal center 30 is adjusted to the position C. With the crank pin 25 at its lowest point and the crank pin 29 at its highest point and the pivotal center at C, the movement of the crank pin 25 through the first unit of distance will result in a very rapid movement of the crank pin 29 through a very much greater distance.

When the lever arm is in the horizontal position indicated by the lines *a*—*b*, the speed of travel of the crank pin 29 will have been reduced to that of the crank pin 25, and during the movement of the crank pin 25 during the balance of the half rotation the speed of travel of the crank pin 29 will progressively decrease until the crank pin 25 is at the top and 29 is at the bottom. Rotation during the next half revolution will cause rapidly acceleratory movement of the crank pin 29.

The blades 21 are shown in cutting position when the crank pin 29 is traveling its fastest, and this would be the adjustment for the shortest sections. For cutting the longest sections, the pivotal center 30 would be adjusted to its highest maximum position.

As previously indicated, the total time cycle is to be adjusted simultaneously with the adjustment of the pivotal center of the lever arm so that the speed of travel of the cutters will be the same as the speed of travel of the sheet in all adjusted positions.

As previously indicated, only one of the three pivotal connections to the lever arm need be fixed and this might be any one of the three pivotal centers. In Figs. 3 and 4 I have shown a construction very similar to Figs. 1 and 2 but with the crank pin 25 engaging a slide block 40 in the lever arm 24*a*, and have shown the stub shaft 30 providing the pivotal center for the lever arm mounted in a cross member 41 rigid with and forming a part of the lever arm. In this construction the lever arm does not move back and forth in respect to its pivotal center but both of the cranks move toward and from the pivotal center, whereas in the form shown in Figs. 1 and 2 the crank arm 22 is directly connected to the lever arm and the pins 29 and 30 both move lengthwise of the lever arm. Obviously, in Figs. 1 and 2, the pin 29 could be journaled directly in the lever arm and the pin 25 journaled in the slide block.

As further obvious alternatives of Figs. 3 and 4, the end portions of the lever arm might be in the form of rods rigid with the bearing 41 and the crank arms 22 and 23 might have collars slidable along the rod and journaled on the crank arms.

The construction shown in Fig. 7 is similar to

that shown in Fig. 1 except that the drive shaft 19 is mounted on the frame member 21, the driving gear 17a is formed integral with the crank arm 22a, the shaft 16 is omitted, the shaft section 15a is solid rather than hollow and the crank arm 23a is bolted to the end of this solid shaft section. To this extent the difference is a mere shifting in the relative positions of the parts. Fig. 7 shows an equivalent type of drive between the cutter member and the lever. As shown, the lever 24a has a crank pin 29a carrying a slide block 28a movable radially in a radial groove or slot 26b formed in the arm 23a. Thus, during rotation, when the pivotal center 30 of the arm 24a is eccentric to the lower cutter drum, the slide block 28a will move outwardly and inwardly along the groove 26b instead of the groove or slot moving endwise in respect to the slide block as in Fig. 1.

In Figs. 5 and 6, there is shown a construction similar to that shown in Figs. 1 and 2 except that there is provided a different means for supporting and adjusting the pivotal center about which the lever arm 24 rotates. In this construction the stub shaft 30a instead of being mounted on a slide constitutes a crank pin carried by a gear 45, having a shaft section 46 mounted for rotation in a pivoted arm 47. The gear 45 meshes with a gear 48 on a shaft 49 journaled in the frame of the machine and coaxial with the pivot pin 50 supporting the swinging lever 47.

The shaft 49 is geared to the shaft 16 so that they rotate with the same R. P. M. Thus, for each rotation of the shaft 16 and its crank arm 22 at uniform angular velocity, there will be a rotation of the gear 45 and crank pin 30a at uniform angular velocity. When the lever 47 is adjusted to such a position that its axis 46 is in alignment with the axis of the shaft 16, the slide 27 will remain at a fixed position in the lever arm 24 and the crank pin 29 and the cutter member will likewise be rotated at uniform angular velocity. The arm 24 does not rotate about the pin 30a as a pivotal center but is rotated about a pivotal center in alignment with the shaft 16 because the two pins 25 and 30a are on opposite sides of the pivotal center and rotate at the same angular velocity and with the same R. P. M.

The shifting of the arm 47 in one direction or the other from that shown in Fig. 5 will cause the imaginary line constituting the pivotal center of the lever 24 to travel in a circular path about the axis of the shaft 16, and the radius of this circle defined on the extent of adjustment. With the axis 46 of the gear 45 to one side or the other of the axis of the shaft 16, there will be a back and forth sliding movement of the slide 27 in the arm 24, a corresponding variation in the distance between the pivot pin 30a and the pivot pin 25, and a corresponding variation in the angular velocity of the driven member in its circular path.

Any suitable means may be adjusted for swinging the lever 47 and locking it in adjusted position. As shown, there is provided an axial movable adjusting rod 52 provided with trunnions 53 journaled in the upper end of the lever 47 and threaded in a mitre gear 54 meshing with a mitre gear 55 on adjusting shaft 56. By rotating the shaft 56 in one direction or the other, the rod 52 is pulled endwise and the lever 47 is swung about its pivotal center 50.

Various other means may be employed for adjusting the pivotal center about which the lever arm 24 rotates and toward or from the pivotal center of the driving or driven members. In the form shown in Figs. 5 and 6, both the pins 25 and 30a constitute driving members for effecting the rotation of the arm 24. If the shaft 49 and the gears 45 and 48 be normally locked against rotation, then the pin 25 would constitute the driving member and the pin 30a would be normally stationary and constitute the pivotal center for the arm 24. In that event, the pivotal center about which the arm 24 swings would not be adjusted toward or from the axis of the shaft 16 but could be adjusted circumferentially in respect thereto so that there would always be the same maximum and minimum angular speeds at approximately diametrically opposite points, but the position of either of these speeds or any intermediate speed could be made to register with the position of the cutter at the instant of cutting.

In Figs. 8 and 9 the driving connections between the lower cutter drum and the pivoted driving lever is effected through a link instead of a block sliding in a groove. In this construction, the arm 23c has a crank pin 29c but this is connected by a link 60 to a crank pin 61 formed integral with or rigidly secured to the lever arm 24c. This link connection permits the lever arm 24c to move back and forth endwise on the pivotal center 30 and the radial spacing between the crank pin 61 and the pivotal center to vary during each rotation.

In Fig. 10, the construction is a simplification and modification of the form shown in Figs. 5 and 6. In Fig. 10, the shaft 49 and gears 45 and 48 are omitted and the pivot pin 30e is formed integral with or is rigidly secured to the adjusting lever 47e. Thus, in effect, the operation is the same as in Figs. 1 and 2 except that the pivot pin 30e is adjusted back and forth substantially in a horizontal plane instead of in a vertical plane. With this shifting in the direction of the movement of adjustment the connections between the two crank arms and the cutter drum 11 would preferably be such that when the crank arms are in substantially the same vertical plane as shown in Figs. 1 and 10, the cutter drums would have their cutters 21 spaced circumferentially about 90° from the position shown in Fig. 2.

In any of the various forms illustrated, the pivotal sliding connections between a crank pin and the cooperating member may be such that the pins are on the power input or the power output element of the driving connection. One such reversal of position of the pin is apparent from a comparison of the arm 23 of Fig. 1 and the arm 23a of Fig. 7. Likewise, any of the pivotal connections which permit sliding movement of a crank pin may be one including a link as in Figs. 8 and 9.

Although in the various forms illustrated, the cutting mechanism includes blades on parallel rotatable drums, one of which is coaxial with the shaft 16, it will be apparent that so far as certain aspects of the present invention are concerned, the crank arm 23 and its shaft section 15 may be connected by gearing or any other suitable power transmitting means to a cutter at some other point in the machine and which has a cyclic movement which is not necessarily a rotary one but in which the travel of the knife at the instant of cutting is in the same direction and at the same speed as that of the material being cut. Therefore, the member 11 may be considered as a cutter-actuating or cutter-operating member whether the blade 21 be directly

mounted thereon or independently mounted and driven therefrom.

In Fig. 2, the members 10 and 11 are both shown as provided with cutter blades. Obviously, one or the other of these members may have a hardened surface against which the blade on the other member engages to effect the cutting on the score rather than the shear principle.

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

1. A cut-off mechanism, including a pair of spaced frame members, a rotatable cutter actuating member, a rotatable driving member coaxial therewith, said last mentioned members being supported by one of said frame members and spaced from and independent of the other frame member, a pair of crank arms, one connected to said cutter actuating member and the other connected to said driving member, said crank arms being rotatable in closely juxtaposed planes adjacent to said first mentioned frame member, each of said crank arms having a pivot pin parallel to the axis of said coaxial members and projecting away from the latter, a pivotal support carried by the other frame member and extending toward but spaced from said coaxial members and disposed between said crank pins in the plane of rotation of the latter, means for bodily moving said pivotal support laterally in respect to its axis, and a lever member disposed between said frame members and having its end portions engaging said crank pins and its intermediate portion engaging said pivotal support, at least one of the points of engagement being slidable in the direction of the length of said lever member whereby said cutter actuating member ir rotated at variable speed when said driving member is rotated at uniform speed and said pivotal support is out of alignment with the common axis of said last mentioned members.

2. A cut-off mechanism, including a pair of spaced frame members, a rotatable cutter actuating member, a rotatable driving member coaxial therewith, said last mentioned members being supported by one of said frame members and spaced from and independent of the other frame member, a pair of crank arms, one connected to said cutter actuating member and the other connected to said driving member, and rotatable in closely juxtaposed planes adjacent to said first mentioned frame member, a pivotal support carried by the other frame member and extending toward but spaced from said crank arms, means for bodily moving said pivotal support laterally in respect to its axis, and a lever member adjacent to said crank arms and having its end portions operatively engaging the end portions of said crank arms, and its intermediate portion engaging said pivotal support at least one of these three points of engagement being slidable.

3. A cut-off mechanism, including a frame member, a rotatable cutter actuating member, a rotatable driving member coaxial therewith, said last mentioned members being supported by said frame member, a pair of crank arms, one connected to said cutter actuating member and the other connected to said driving member, said crank arms being rotatable in closely juxtaposed planes closely adjacent to said frame member, a pivotal support mounted independently of said frame member and extending toward but spaced from said crank arms, means for bodily moving said pivotal support laterally in respect to its axis, and a lever member having its end portions operatively engaging the end portions of said crank arms and its intermediate portion engaging said pivotal support, at least one of these three points of engagement being slidable whereby said cutter actuating member is rotated at variable speed when said driving member is rotated at uniform speed and said pivotal support is out of alignment with the common axis of said last mentioned members.

4. A cut-off mechanism having a frame, a cutter operating member and a driving member coaxially mounted in said frame, crank arms connected to said coaxial members and disposed closely adjacent to said frame and extending in approximately opposite radial directions, a lever at the side of said crank arms away from said frame, driving connections between the opposite end portions of said lever and said crank arms, at least one of these connections being slidable, a cover member enclosing said parts, but independent of any supporting connection thereto, and a pivotal support for the intermediate portion of said lever, mounted on said cover member and adjustable therealong and toward and from the axis of said coaxial members.

5. A cut-off mechanism having a frame, a cutter operating member and a driving member coaxially mounted in said frame, crank arms connected to said coaxial members and disposed closely adjacent to said frame, and extending in approximately opposite radial directions, a lever at the side of said crank arms away from said frame, driving connections between the opposite end portions of said lever and said crank arms, at least one of these connections being slidable and a pivotal support for said lever, intermediate of the ends of the latter, mounted independently of said frame and laterally adjustable in respect to its pivotal center.

6. A cut-off mechanism having a frame, a cutter operating member and a driving member coaxially mounted in said frame, crank arms connected to said coaxial members and disposed closely adjacent to said frame, and extending in approximately opposite radial directions, a lever at the side of said crank arms away from said frame, a pivot support mounted independent of said frame and laterally adjustable in respect to the axis of said first mentioned members, pins carried by said crank arms and projecting into said lever from one side of the latter, at least one of these cranks having a pin slidable in the lever and a pivot pin carried by said pivot support and projecting into said lever from the other side.

7. A cut-off mechanism including a rotary cutter-actuating member, a driving gear member coaxial therewith, a lever arm rotatable about a pivotal center intermediate of its ends, driving connections between one end portion of said lever arm and said gear member, driving connections between said cutter-actuating member and the other end portion of said lever arm, one of said connections being slidable, and the other non-slidable, and a member for moving the pivotal center of said lever arm lengthwise of said lever arm.

8. A cut-off mechanism including a rotary cutter-actuating member, a drive shaft extending therethrough, said member having crank arms disposed in closely juxtaposed planes transverse to said shaft, a lever arm extending approximately diametrically across the axis of said shaft and having its opposite end portions pivotally

connected to said crank arms respectively, at least one of the pivotal connections permitting sliding movement along said lever arm, a pivotal support for said lever intermediate of its ends, and means for adjusting said pivotal support along the length of said lever arm.

9. A cut-off mechanism including a rotary cutter-actuating member, a rotary driving member coaxial therewith, each of said members having a crank arm and said arms being rotatable in closely juxtaposed planes and each having a crank pin, a lever, a normally stationary pivot pin slidably engaging said lever intermediate of its ends, and means for adjusting the position of said pivot pin toward or from one end of said lever whereby when the mechanism is running with said pivot pin out of alignment with the axes of said members, said lever moves back and forth endwise and diametrically of said pivot pin.

10. A cut-off mechanism including a rotary cutter-actuating member, a rotary driving member coaxial therewith, each of said members having a crank arm and said arms being rotatable in closely juxtaposed planes and each having a crank pin, a lever, a normally stationary pivot pin engaging said lever intermediate of its ends, and means for adjusting the position of said pivot pin, one of said crank pins and said pivot pin having sliding movement along the length of the lever arm.

11. A cut-off mechanism including a rotary cutter-actuating member, a rotary driving member coaxial therewith, each of said members having a crank arm and said crank arms being disposed in closely juxtaposed planes, a lever element, a pivotal support for the latter intermediate of its ends and having sliding movement along the length of said lever, and adjustable in respect to the axis of said members and pivotal connections between said crank arms and opposite end portions of said lever element, one only of said pivotal connections being slidable along the length of said lever element.

12. A cut-off mechanism including a rotary cutter-actuating member, a rotary driving member coaxial therewith, a lever arm, a pivotal support therefor, means on the side of said lever arm farthest from said members and operable while the mechanism is running, for laterally adjusting said pivotal support, and pivotal connections between said members and opposite end portions of said lever, one of said pivotal connections being slidable along said lever and said lever being slidable on said pivotal support during rotation of said members when said pivotal support is out of alignment with said members.

13. A cut-off mechanism including a rotary cutter-actuating member, a rotary driving member coaxial therewith, and extending therethrough, a rotary member having its axis parallel to the axis of said driving member, a lever arm, a pivotal support for said lever arm intermediate of the ends thereof and carried by said rotary member, pivotal connections between the opposite end portions of said lever arm and said driving member and said cutter-actuating member respectively, and means for rotating said rotary member with the same angular velocity and in the same direction as said driving member.

14. A cut-off mechanism including a rotary cutter-actuating member, a rotary driving member coaxial therewith and extending therethrough, a rotary member having its axis parallel to the axis of said driving member, a lever arm, a pivotal support for said lever arm intermediate of the ends thereof and carried by said rotary member, pivotal connections between the opposite end portions of said lever arm and said driving member and said cutter-actuating member respectively, means for rotating said rotary member with the same angular velocity and in the same direction as said driving member, and means for adjusting the axis of said rotary member toward and from the axis of said driving member.

15. A cut-off mechanism including a cutter-actuating member, a driving member coaxial therewith, a lever member extending approximately diametrically across the axis of said members and having pivotal sliding connections between opposite ends thereof and said driving member and cutter-actuating member respectively, and means for causing the pivotal center of said lever to travel in a circle concentric with said axis.

16. A cut-off mechanism including a cutter-actuating member, a driving member coaxial therewith, a lever member extending approximately diametrically across the axis of said members and having pivotal sliding connections between opposite ends thereof and said driving member and cutter-actuating member respectively, means for causing the pivotal center of said lever to travel in a circle concentric with said axis, and means for adjusting the radius of said circle to and from zero.

17. A cut-off mechanism including a rotary cutter-actuating member, a driven member coaxial therewith, a pivoted lever, a gear carried thereby and having its axis parallel to the axis of said driving member, means for rotating said gear at the same angular velocity and in the same direction as said driving member, a lever arm, diametrically opposed crank connections between said lever arm and said cutter actuating member and said driving member respectively, and crank connections between said lever arm and said gear.

18. A cut-off mechanism including a rotary cutter-actuating member, a driven member coaxial therewith, a pivoted lever, a gear carried thereby and having its axis parallel to the axis of said driving member, means for rotating said gear at the same angular velocity and in the same direction as said driving member, a lever arm, diametrically opposed crank connections between said lever arm and said cutter actuating member and said driving member respectively, crank connections between said lever arm and said gear, and means for adjusting the position of said pivoted lever about its pivot.

19. A cut-off mechanism including a rotatable cutter carrying member having a crank arm, a rotatable driving member having a crank arm, said crank arms being rotatable about a common axis in closely juxtaposed parallel planes, and extending in opposite directions therefrom said axis, and having parallel crank pins extending in the same general direction, a lever disposed in a plane closely juxtaposed to said first mentioned planes, a lever support on the side of said lever away from said crank arms, three pivotal connections, one between one end of the lever and one crank arm, another between the other end of said lever and the other crank arm, and the third between an intermediate portion of said lever and said support, said last mentioned connection being adjustable toward and from said axis, and permitting the lever to slide

back and forth endwise thereon during rotation of said crank arms.

20. A cut-off mechanism including a rotatable cutter carrying member having a crank arm, a rotatable driving member having a crank arm, said crank arms being rotatable about a common axis in closely juxtaposed parallel planes, and extending in opposite directions therefrom said axis, and having parallel crank pins extending in the same general direction, a lever disposed in a plane closely juxtaposed to said first mentioned planes, a lever support on the side of said lever away from said crank arms, three pivotal connections, one between one end of the lever and one crank arm and slidable along the lever, another between the other end of said lever and the other crank arm and in a fixed position in respect to the lever, and the third between an intermediate portion of said lever and said support, said last mentioned connection being adjustable toward and from said axis, and permitting the lever to slide back and forth endwise thereon during rotation of said crank arms.

21. A cut-off mechanism including a rotatable cutter actuating member having a crank arm, a rotatable driving member coaxial therewith and having a crank arm, a lever, a lever support, three pivotal connections, one between one end of the lever and one crank arm, another between the other end of said lever and the other crank arm, and the third between an intermediate portion of said lever and said support, said last mentioned connection being laterally adjustable, said lever being slidable back and forth endwise and in respect to said last mentioned connection when the latter is out of alignment with the axis of said crank arms and said crank arms rotate.

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