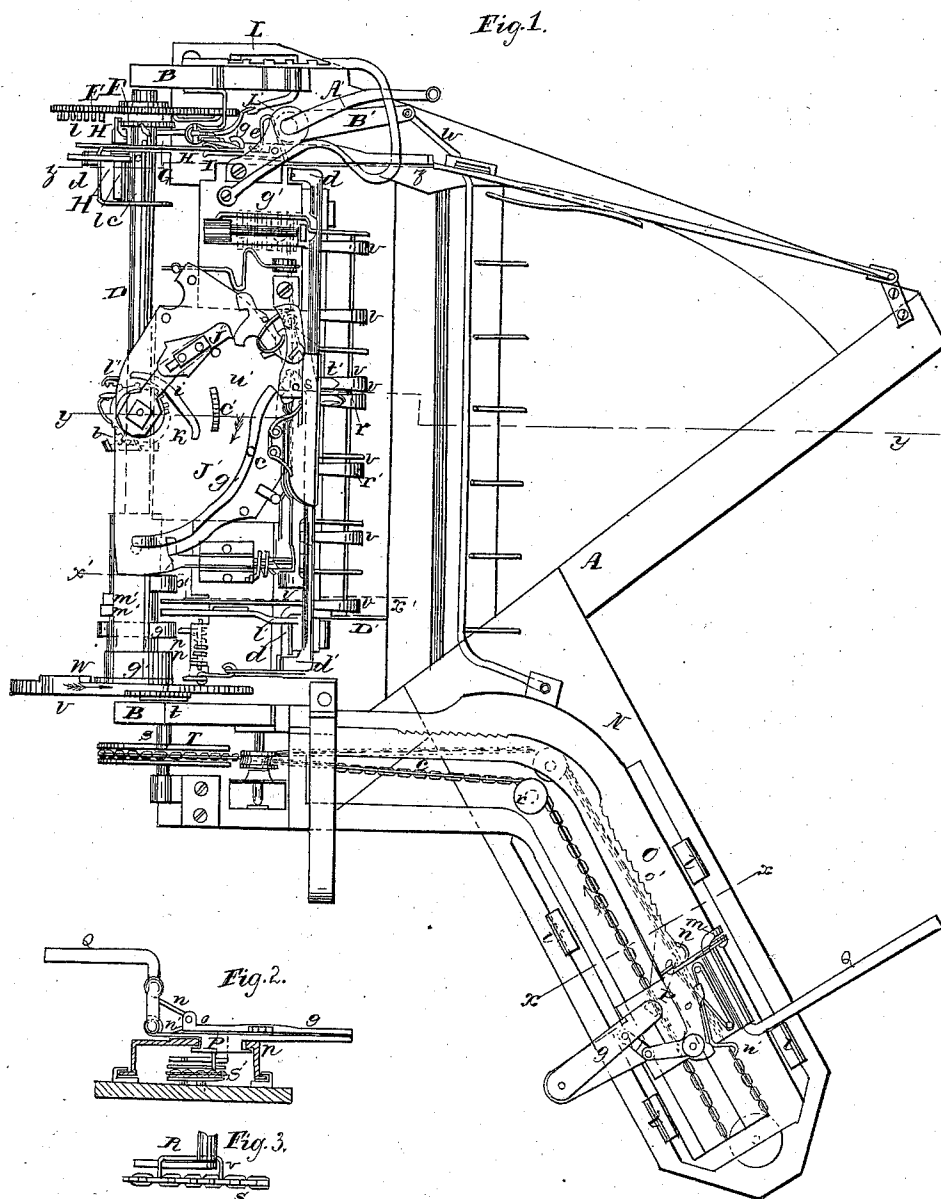


J. BARTA.
Grain-Binder.

3 Sheets—Sheet 1.

No. 54,672.

Patented May 15, 1866.



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No. 54,672.

Patented May 15, 1866.

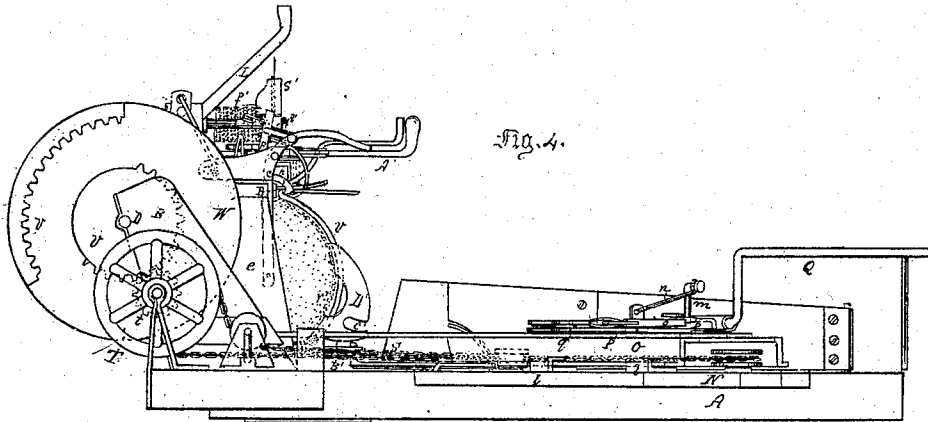


Fig. 4.

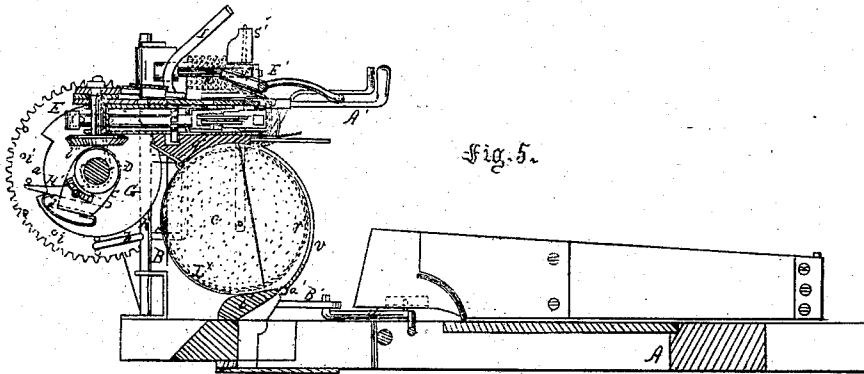


Fig. 5.

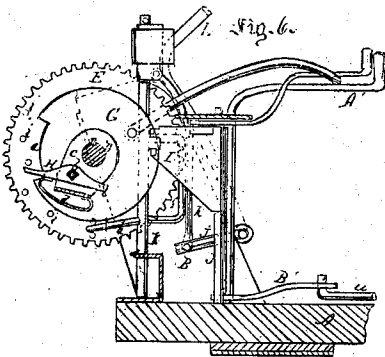


Fig. 6.

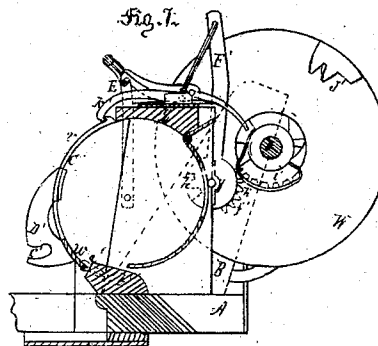


Fig. 7.

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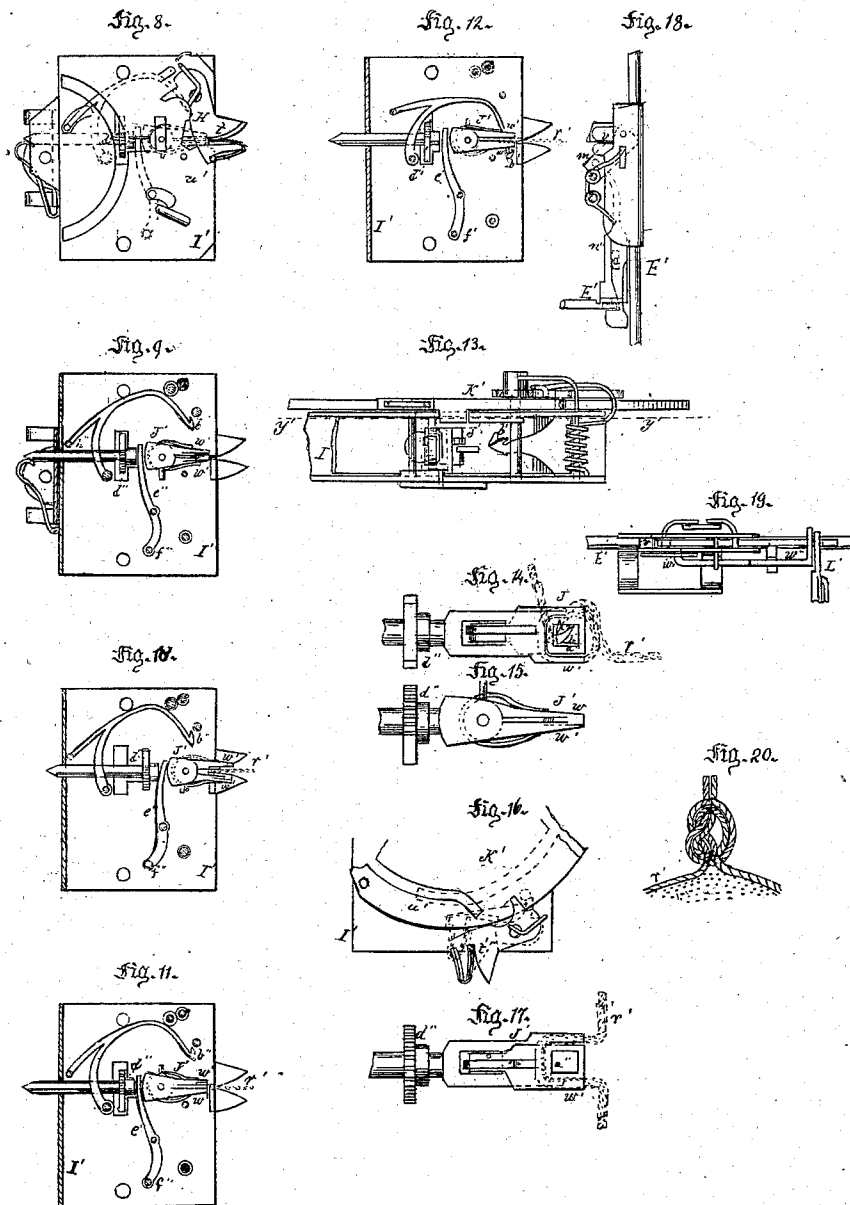
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3 Sheets—Sheet 3.

No. 54,672.

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UNITED STATES PATENT OFFICE.

JOSEPH BARTA, OF LA CROSSE, WISCONSIN.

IMPROVEMENT IN RAKING AND BINDING ATTACHMENTS TO HARVESTERS.

Specification forming part of Letters Patent No. 54,672, dated May 15, 1866.

To all whom it may concern:

Be it known that I, JOSEPH BARTA, of La Crosse, in the county of La Crosse and State of Wisconsin, have invented a new and Improved Raking and Binding Attachment for Reapers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet No. 1, is a plan or top view of my invention; Fig. 2, a vertical section of a portion of the same, taken in the line *xx*, Fig. 1; Fig. 3, a detached view of a part pertaining to the same. Fig. 4, Sheet No. 2, is a side view of the same; Fig. 5, a vertical section of the same, taken in the line *yy*, Fig. 1; Fig. 6, a vertical section of a portion of the same, taken in the line *zz*, Fig. 1; Fig. 7, a vertical section of a portion of the same, taken in the line *x'x'*, Fig. 1. Figs. 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, and 20, Sheet No. 3, are views pertaining to the knot-tying and cord-cutting mechanism.

Similar letters of reference indicate corresponding parts.

This invention relates to a new and improved raking and binding attachment for reapers, designed to be operated automatically throughout from the driving-wheel of the reaper to which it may be applied.

The object of the invention is to obtain a device for the purpose specified which will be capable of being put in motion at longer or shorter intervals, as occasion may require, and be also capable of being adapted for binding long or short grain.

I will first proceed to describe the driving mechanism, by which the device is operated. A represents the framing of a reaper, and B B standards attached thereto, in which the bearings C of a horizontal shaft, D, are fitted. On one end of this shaft a wheel, E, is placed loosely, so that it may turn independently of the shaft, and this wheel E has a ratchet, F, attached concentrically to its inner side. G is a wheel attached permanently to the shaft D, and having a recess or notch, *a*, made in its edge, as shown clearly in Figs. 5 and 6, and H is a pawl which is attached to one end of

a shaft, *b*, which has its bearings in arms *c* attached to the shaft D, said shaft passing through the wheel G, and having a lever, H', attached to it, which is by the side of the notch *a* at one end of the same, a spring, *d*, bearing against said lever in order to keep the pawl H engaged with the ratchet. I is a plate attached to the upper part of a vertical shaft, J, and having a spring, *e*, bearing against it, which spring has a tendency to keep the plate I in line with the lever H. K is an upright shaft, which has an arm, *f*, projecting from it, and passing through an eye or loop, *g*, attached to plate I. From the lower part of this shaft K a lever, *h*, projects, with which pins *i* on the inner side of the wheel E come in contact. These pins *i* are arranged in concentric circles at the inner side of the wheel E, said circles of pins varying of course in diameter, gradually decreasing in diameter as they approach the center of the wheel, and only one circle of pins operate against the lever *h* at a time, and said lever may be brought in range or line with any one of said circles by raising or lowering the shaft K, which is done by means of a lever, L, the lower end of which is connected by an arm, *j*, to the lower end of a bar, *k*, the upper end of the latter being attached to the upper end of shaft K. The shaft K is retained in the desired position by having the lever L fitted in a proper notch in a segment-bar, M, attached to one of the uprights B.

The office of the pins *i* and lever *h* is to draw the plate I out of line with the lever H', so that the pawl H may be kept in contact with the ratchet F, and motion be communicated from wheel E to shaft D.

It will be understood that when the plate I is in line with the lever H', the latter will come in contact with the former, and the pawl H will be thrown out from the ratchet F, consequently the wheel E and ratchet F will rotate without communicating motion to shaft D, but when a pin, *i*, strikes the lever *h*, the plate I is drawn out of line with the lever H', and the spring *d* immediately throws the pawl H in contact with the ratchet F. When the plate I is thus drawn out of line with the lever H', the wheel G catches in a groove in the edge of said plate and keeps the lever *h* out

free from the pins *i*, so that the latter cannot be acted upon by the former, and the spring *e* throws the plate *I* out of line with lever *H'* when the notch *a* of the wheel *G* comes opposite the plate *I*.

From the above description it will be seen that the shaft *D* will be rotated at longer or shorter intervals, according to which circle of pins *i* the lever *h* is adjusted in line with. For instance, if the outermost circle has six pins *i*, the shaft *D* will rest during one revolution of wheel *E*, the time said wheel makes one-sixth of a revolution, and if the innermost and smaller circle has but one pin *i*, the shaft *D* will be rotated one revolution during every two revolutions of a wheel, *E*, *D* rotating one revolution, with *E* remaining stationary the next revolution, and moving with it the succeeding one, and so on.

Thus it will be seen that the binding apparatus may by a very simple adjustment on the part of the attendant be operated intermittently at longer or shorter intervals, as may be required, and this variation in the dwells of the raking and binding operation is necessary in order to have the sheaves of a proper size. In cutting light grain the intervals between the raking and binding operation should be long, in order that a requisite quantity of grain may be cut to form a proper-sized sheaf, but in cutting heavy grain the intervals must be much shorter, to avoid unnecessarily large sheaves.

I will now proceed to describe the raking apparatus, which takes the cut grain from the platform and deposits it in the binding-cradle. The platform of the reaper is not shown in the drawing, but it is directly in front of a bed, *N*, which extends out from the frame of the machine, and has a metallic sliding frame, *O*, upon it, fitted between guides *l*. This frame *O* is of curved form, as shown clearly in Fig. 1, and it is slotted its entire length, and has a plate, *P*, fitted upon it, one end of which is bent or curved to form an eye to receive the rake-head *Q*, which is allowed to turn freely therein. The rake extends over the platform, and is at right angles with the sickle or cutter, the portion of the rake-head which is fitted in the eye of plate *P* being at right angles with the part to which the rake-teeth are attached, and to the outer end of the rake-head adjoining the eye there is an arm, *m*, which is connected by a rod, *n*, with a bent lever, *o*, on plate *P*, and this bent lever *o* is connected by a link, *p*, with a lever, *q*, on plate *P*, said lever *q* having its free or disengaged end connected by a rivet with a plate, *R*, underneath or within the frame *O*. (See Figs. 2 and 3.) *S* is an endless chain, which works around pulleys *r* on the bed *N* within the frame *O*, and around a pulley, *T*, on a shaft, *s*, which has a pinion, *t*, on its inner end, said pulley *T* being turned first in one direction and then in the other in consequence of a part pinion, *U*, and a toothed segment, *V*, on a wheel, *W*, gearing

alternately into the pinion *t*, the wheel *W* being on the shaft *D*. To the chain *S* a staple, *X*, is attached, through which the plate *R* passes, and by this means the rake-head is connected with the chain *S* and a reciprocating motion given the rake over the platform. As the rake is moved from the inner to the outer side of the platform the former is held in an upright position, so as not to interfere with the cut grain falling thereon in consequence of the staple *X* pressing against the plate *R* in the direction indicated by arrow 1, (see Fig. 1,) and during the return movement of the rake it is kept down upon the platform in consequence of the staple *X* bearing against plate *R* in the direction indicated by arrow 2. The rake is prevented from making a retrograde movement while traveling in either direction by means of two pawls, *n'* *n'*, which engage alternately with a rack, *o'*, on the frame *O*, said pawls being freed from the rack by the bent lever *o*, when the latter is moved to raise and lower the rake. (See Fig. 1.)

The frame *O* I termed a sliding one, in consequence of it being capable of adjustment on the bed *N* in a longitudinal direction therewith, so as to be nearer to or further from the outer end of bed *N*. This adjustment of the frame *O* admits of the cut grain being delivered to the cradle centrally therewith, the adjustment compensating for the variation in the length of the grain. When long grain is being cut the frame *O* is adjusted outward on the bed *N* as far as possible, and adjusted inward when short grain is being cut. The frame *O* is moved by means of a lever, *A'*, having a crank, *B'*, at its lower end, which crank is connected by a rod, *n*, with frame *O*. (See more particularly Figs. 1 and 6.) *C'* represents the cradle into which the cut grain is discharged by the rake. This cradle is composed of a series of curved teeth, *v*, extending from a plate, *w*, the ends of which are provided with journals fitted in eyes *a* at the front edge of an inclined bar, *b'*, on the framing. This cradle is allowed to work freely up and down on its journals as centers, and the outer tooth *v* at one end of the cradle has a plate, *D'*, attached to it, said plate having a notch, *c'*, made in it, to receive a projection, *d'*, on a bar, *E'*, the ends of which are bent at right angles with its main portion to form arms *d*, which are pivoted to uprights *e' e'* on the framing of the machine. This bar *E'* is raised and lowered by means of a lever, *F*, which has a part pinion, *f'*, attached to it concentric with its fulcrum-pin *g'*, said part pinion *f'* having two sets of teeth, *h' h'*, into which respectively a concentric pinion, *i*, on the inner side of the wheel *W*, and a toothed segment, *j*, on the same side of said wheel, gear alternately, thereby raising and lowering the bar *E'*. (See Fig. 7.) When the bar *E* rises, the cradle *C'* is also raised, in consequence of the projection *d'* of bar *E'* catching

into the notch *c'* of plate *D'*, and when the cradle is raised it is held in an elevated position by means of a catch, *k'*, and the bar *E'* is held in an elevated position by means of a catch, *l'*. The bar *E'* and the cradle *C'* are released at the proper time by projections *m'* on the shaft *D*, the bar being released a little in advance of the cradle. The cut grain is raked from the platform of the reaper into the cradle *C'* when the latter is down, and by means of the adjustment of the frame *O*, as previously described, the grain may be discharged centrally into the cradle, so that the cord may be passed and secured centrally around the sheaves. The cord is wound upon a spool placed on a horizontal shaft, *p'*, supported by uprights on a bar, *q'*, on the upper ends of the uprights *c' e'*. The cord *r'* passes through an eye or guide, *s'*, attached to the bar *q'*, and then through a clamp, *t'*, at the front end of a bent lever, *H'*, placed on the top plate *w'* of a case, *I'*, which contains the knot-tying mechanism, the end of the cord being secured in a clamp, *v'*, attached to bar *E'*. When the grain is discharged into the cradle *C'* it rests upon the cord *r'*, and when the bar *E'* rises, the cord is drawn around the grain and is passed in to clamp *t'*, a twister, *J'*, being thrown forward with open jaws *w' w'* to grasp the cord, the twister being then drawn back, leaving the cord around a hollow square, *a''*, on one of the jaws *w'*. (See Fig. 17.) After the twister is drawn back it turns to give the twist to the cord, and after the twist is given, a curved hook, *b''*, passing through the eye and drawing the cord through the loop of the cord, and thereby forming the knot. The twister *J'* is rotated by a toothed segment, *c''*, attached to a pivoted plate, *K'*, on the top plate *w'* of the case *I'*, said segment gearing into a pinion, *d''*, on the twister-shaft, and the twister is moved forward by means of a lever, *e''*, having a pin, *f''*, attached, which is fitted in a curved slot, *g''*, in plate *K'*, and the hook *b''* is moved from the plate *K'* in consequence of a pin, *h''*, attached to an arm on the hook passing through a slot, *i''*, in said plate. The plate *K'* is moved by an arm, *j''*, on a vertical shaft, *k''*, operated from the shaft *D* by part pinions *l''*. After the knot is tied the cord above the knot is cut by shears *m''* on the bar *E'*, the moving blade being connected to a slide, *n''*, on bar *E'*, and operated by a lever, *L'*, which is actuated by a cam, *O''*, on shaft *D*. The sheaf is retained in the cradle *C'* while being bound by means of a lever or arms, *p''*, acted upon by cams *q''* on shaft *D*, and when the knot is tied and the cord cut above it, the apron *L'* is released and the bound sheaf rolls down the inclined bar *b'*, and raising the apron *L*, passes out. The bar *E'* and cradle *C'* are then lowered, the cord *r'* extended down with bar *E'*, and a succeeding gavel is raked with cradle *C'*, to be bound as before.

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

1. The wheel *E*, provided with pins *i* arranged in concentric circles, and the ratchet *F* connected with said wheel, and both placed loosely on shaft *D*, in combination with the notched wheel *G* on shaft *D*, the pawl *H* provided with the lever *H'*, and the plate *I*, all arranged substantially as shown and described, for the purpose of rotating the shaft *D*, and consequently the raking and binding device, intermittently, at longer or shorter intervals, as may be desired.

2. The endless chain *S*, arranged to operate first in one direction and then in the other, in combination with the plate *P*, having the rake-head *Q* attached, the levers *o q*, plate *R*, and the staple *X*, all arranged substantially as shown, to give the reciprocating movement to the rake, and also the rising and falling movement, substantially as described.

3. The adjustable frame *O*, on which the plate *P* works, for the purpose of adjusting the rake in such a relative position with the cradle as to cause the sheaves to be bound centrally, whatever the height or length of the grain may be, substantially as set forth.

4. The pawls *n' n'* applied to the plate *P*, and arranged so as to be operated thereon in and out of gear with rack *o'*, through the medium of the bent lever *o*, at the time of the raising and lowering of the rake, substantially as described.

5. The cradle *C'* and bar *E'*, arranged and combined as shown, so that the bar as it is raised by the rotation of shaft *D* will raise the cradle with it, the cradle holding the gavel in position, and the bar *E* drawing the cord *r'* around it, substantially as set forth.

6. The twister *J* provided with jaws *w' w'*, one of which is furnished with a hollow square, *a''*, in combination with the hook *b''* and the clamps *t' v'*, all arranged to operate substantially as shown, for the purpose of tying the knot.

7. The pivoted plate *K'*, operated from the shaft *D*, and provided with slots, segment-rack, &c., for the purpose of operating the hook *b''* and twister *J*, as set forth.

8. The apron *L'*, operated by the lever or arm *p''*, cam *q''* on shaft *D*, in combination with the cradle *C'* and bar *E'*, all arranged to operate in the manner substantially as and for the purpose specified.

9. The shears *m''* placed on the bar *E'* and operated from the shaft *D* to cut the cord, substantially as herein set forth.

The above specification of my invention signed by me this 18th day of December, 1865.

JOSEPH BARTA.

Witnesses:

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