

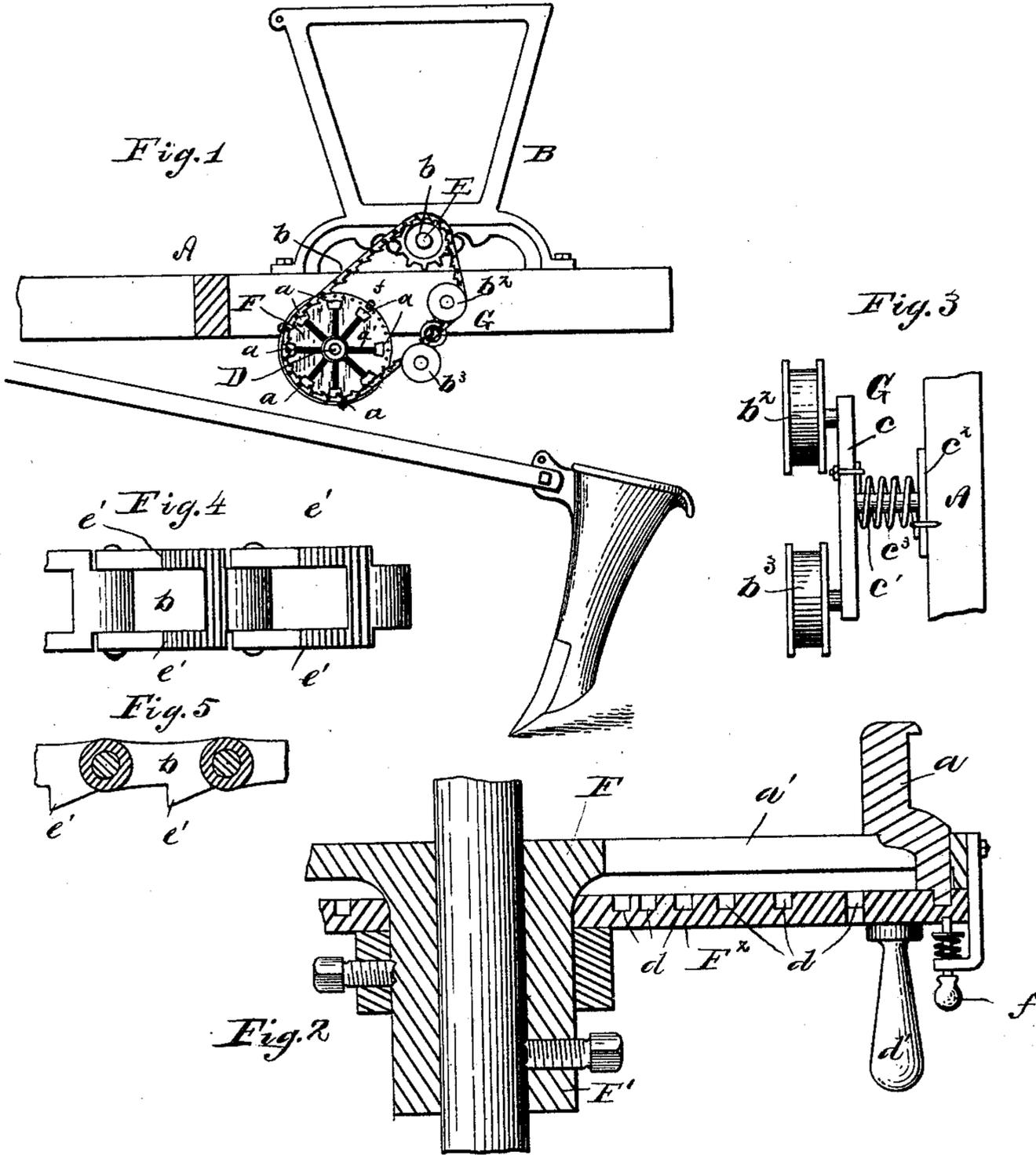
(No Model.)

2 Sheets—Sheet 1.

C. E. PATRIC.  
CHANGE OF SPEED.

No. 414,324.

Patented Nov. 5, 1889.



Witnesses  
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 Chas. V. Welch,

Inventor  
 Charles E. Patric  
 By Paul A. Statton

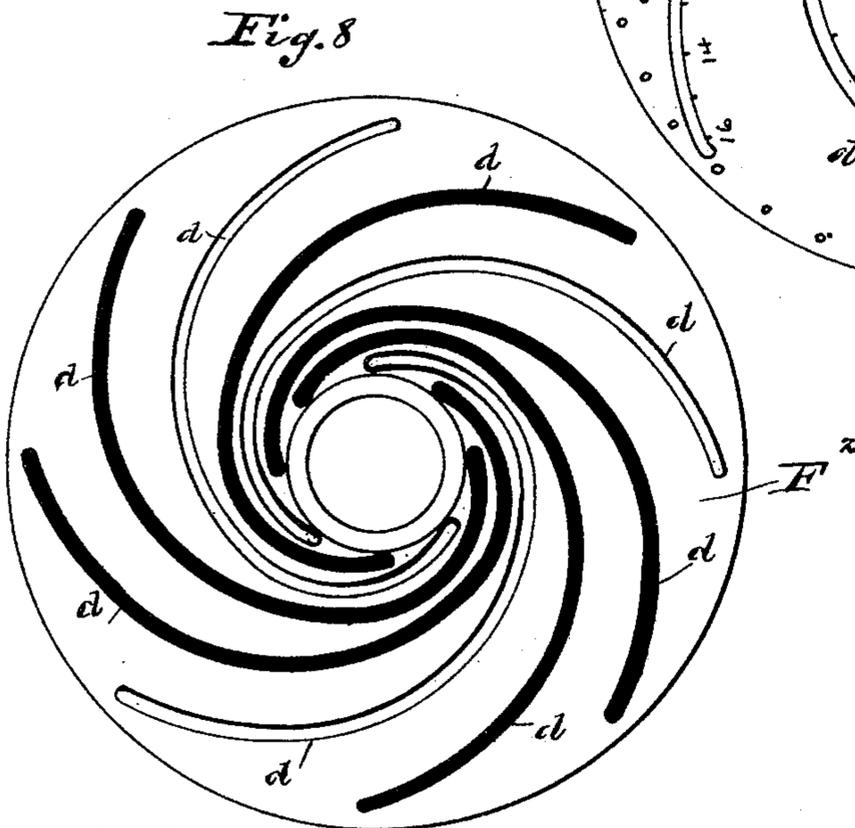
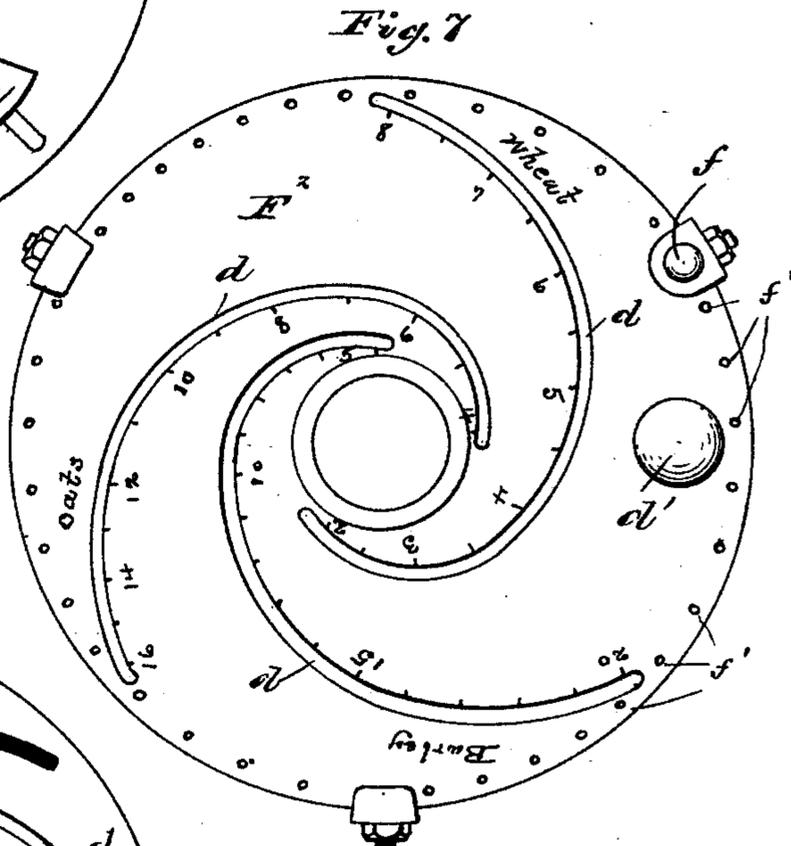
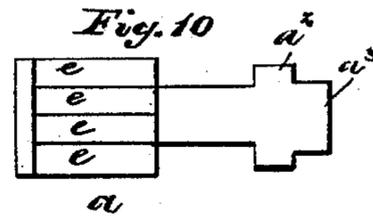
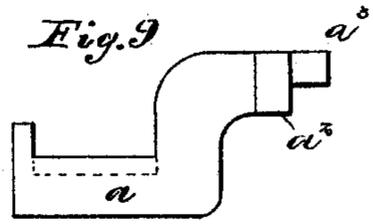
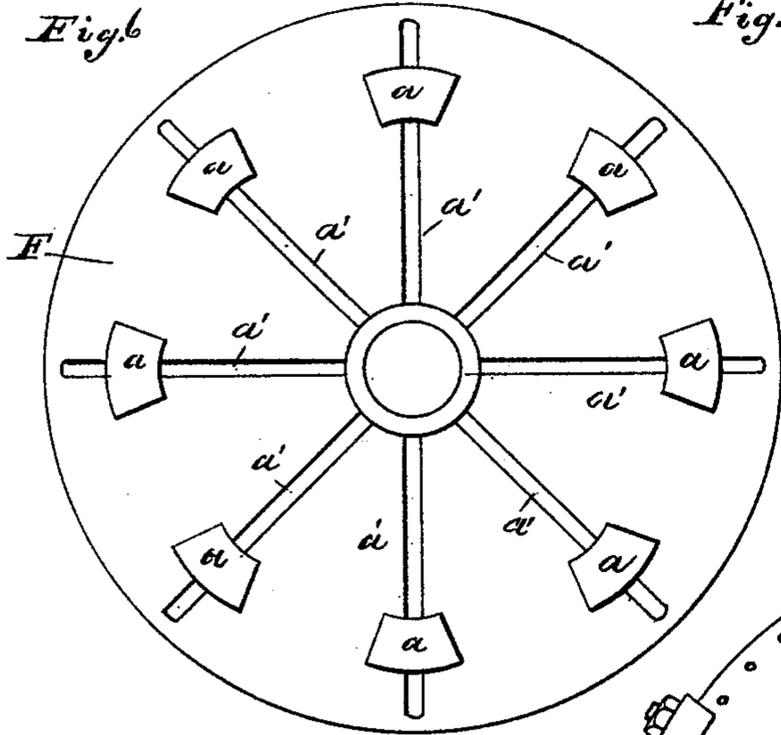
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2 Sheets—Sheet 2.

C. E. PATRIC.  
CHANGE OF SPEED.

No. 414,324.

Patented Nov. 5, 1889.



Witnesses  
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Inventor  
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# UNITED STATES PATENT OFFICE.

CHARLES E. PATRIC, OF SPRINGFIELD, OHIO.

## CHANGE OF SPEED.

SPECIFICATION forming part of Letters Patent No. 414,324, dated November 5, 1889.

Application filed July 15, 1889. Serial No. 317,542. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. PATRIC, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Change of Speed, of which the following is a specification.

My invention relates to an improvement in devices for readily changing the speed of one moving part of a machine or mechanism with relation to another connected directly thereto.

My invention is especially adapted for use in grain-drills to vary the quantity of seed sown by varying the speed of the feeding-shaft, though the device is by no means limited in its usefulness to this particular purpose.

My invention consists in the various constructions and combinations of parts, herein-after described, and set forth in the claims.

In the accompanying drawings, Figure 1 is an elevation view illustrating my device in connection with a portion of a grain-drill. Fig. 2 is an enlarged sectional view in detail of the driving wheel or pulley. Fig. 3 is a side elevation view of the tension device. Figs. 4 and 5 are respectively a plan and sectional elevation of a chain preferably used for forming the connection between the moving parts of my device. Fig. 6 is a front elevation of the driving wheel or pulley, showing the radial slots in which the sprocket or driving projections are adapted to be adjusted. Fig. 7 is a front elevation view of the adjusting disk-wheel forming a portion of the driving wheel or pulley. Fig. 8 is a rear elevation view of the same. Figs. 9, 10, and 11 are respectively a side elevation, a plan, and a sectional elevation of the sprocket projection operating in radial slots on the driving-pulley.

Like parts are represented by similar letters of reference throughout the several views.

In the said drawings, A represents the main frame of a grain-drill; B, the hopper; D, the driving-shaft, and E the feeding-shaft.

Located upon the driving-shaft D is my improved adjustable driving pulley or wheel F, provided with sprocket or driving projections  $a$ , extending laterally from the face of said driving-pulley.  $b$  is a driving-chain,

which passes about said sprocket projections and over a sprocket-wheel  $b'$  on the feed-shaft E, and thence over suitable guiding-pulleys  $b^2 b^3$  on a tension device G, pivoted to the main frame. This tension device G consists, essentially, of an arm  $c$ , provided at each end with suitable bearings for the guiding-wheels  $b^2 b^3$ , and at the center with a trunnion  $c'$ , turning in a suitable bearing  $c^2$ , secured to the frame A. A spring  $c^3$  about the trunnion  $c'$ , and having its end secured, respectively, to the frame A and to the arm  $c$ , is adapted to be compressed as the arm is turned in its bearing, the said spring thus furnishing means for pressing the guiding-wheels  $b^2 b^3$  against the respective sides of the chain  $b$ .

The driving-sprockets  $a$  are each located in a slotted opening  $a'$  in the face of the driving pulley or wheel F. These sprocket projections are each formed with a T-shaped head  $a^2$  and an auxiliary projection  $a^3$ , adapted when turned in one position to be slipped through the slotted opening  $a'$ , and when turned to the other position to come against the inner side of the driving-pulley, and thus prevent the said projections from passing through said slotted openings.

Located immediately back of the main portion of the driving wheel or pulley F, and preferably journaled on the hub  $F'$  of said pulley, is a revolving disk  $F^2$ , provided on its face with a series of spiral slots  $d$ , each extending from near the periphery of said disk to about the center of said disk. The auxiliary projection  $a^3$  on each of the sprocket or driving projections  $a$  is adapted to fit into one of the spiral grooves  $d$  in the said disk, as shown in Fig. 2. A suitable handle  $d'$  is provided for turning said disk  $F^2$  with reference to the driving-pulley F, and suitable means are provided for holding the said disk in any desired position with reference to the said pulley. It will be seen by this construction that when the disk  $F^2$  is revolved with reference to the driving-pulley F all the sprockets or driving projections  $a$  are moved simultaneously to or from the center of said driving-pulley, the respective parts being in the device illustrated arranged so that about three-fourths of a revolution of the disk  $F^2$  moves the driving or sprocket pro-

jections from one end of the radial slots to the other. The tension device G, operating automatically, takes up the slack of the driving-chain as the driving-pulley is increased 5 or diminished in size by thus moving its sprocket or driving projections. It will be seen, therefore, that by this construction any desired speed within certain limits may be secured for the driven shaft with reference 10 to the driver.

In order to provide for the proper paying out or compensation of the driving-chain with reference to the sprocket projections when said sprocket projections are moved out- 15 wardly on the driving-pulley, I preferably form the said sprocket projections with a series of ratchet-teeth *e*, and provide on the driving-chain, preferably on the edges thereof, similar teeth *e'*. In other respects 20 the driving-chain may be made of the usual sprocket form adapted to pass over an ordinary sprocket-wheel *b'* upon the driven shaft. By the use of these ratchet-teeth *e'* in connection with the similar teeth *e* on the chain and 25 sprocket projections, respectively, the said chain is adapted to adjust itself to any movement of the sprocket projections and at the same time always remains in driving contact with one or more of said sprocket projections 30 without any undue strain upon said chain, which would otherwise be the case if ordinary sprocket projections were used.

When my device is used in connection with grain-drills, I preferably extend one or more 35 of the spiral grooves *d* entirely through the disk *F*<sup>2</sup>, and provide on the extended portion *a*<sup>3</sup> of the sprocket projection in each of said grooves a suitable marker or graduation adapted to come adjacent to similar graduations 40 along the spiral grooves, and thus designate the amount of adjustment of said sprocket projections, which adjustment, when the device is used in connection with seeding-machines, may be made in quantities or frac- 45 tional portions of a bushel representing the amount of seed sown per acre by the speed of the feed-shaft when the driving-pulley is adjusted to that particular point.

The means I have shown for holding the 50 disk-wheel in the different positions of adjustment consists of a small spring bolt or pin *f*, adapted to engage in a series of openings *f'*, arranged about the periphery of said disk-wheel, the said openings being arranged 55 and located in connection with the spiral slots, so that the adjustment of the disk-wheel to a distance equal to one or more of the openings *f'* will produce an adjustment in the sprocket projections to cause a 60 change in the feed of the seed amounting to a certain fraction of a bushel per acre.

I have shown in the drawings only one adjustable wheel or pulley, which is located on the driving-shaft. It will be seen, however, 65 that, if desired, the adjustable pulley may be located either on the driving or driven shaft,

or both of said pulleys or wheels may be adjustable, if desired.

I have described the above device with special reference to its use in connection with seed- 70 ing-machines, though it will be understood that the device may be used with equally good results in other forms of machines and mechanisms, and I do not intend by anything contained herein to in any way limit myself to a 75 particular use for the said device, but expect to claim it for any use for which it may be found applicable.

It is obvious that the different parts of the described mechanism may be varied from the 80 particular construction set forth in the drawings and described herein. I do not, therefore, intend to limit myself to these exact constructions, but reserve the right to modify 85 and change the special constructions of any or all the parts to best adapt the device for any use for which it may be found applicable.

Having thus described my invention, I claim—

1. The combination, with a driving and 90 driven shaft, and a belt or chain connecting said shafts, of a wheel or pulley on one of said shafts having adjustable driving projections, said driving projections and said belt or chain being so formed as to prevent 95 the slipping of one part with reference to the other, the formation of the parts being such that the belt or chain may adjust itself to the said driving projections as said driving projections are adjusted, substantially as 100 specified.

2. In a change of speed, a pulley having driving or sprocket projections adapted to be adjusted to or from the center of said wheel, a belt or chain passing over said driving pro- 105 jections, ratchet-teeth on said chain, and similar teeth on the driving projections, whereby said chain is permitted to accommodate itself to the adjustment of said sprocket projections, substantially as specified. 110

3. In a change of speed, a wheel or pulley having adjustable driving projections extending laterally therefrom and operating in radial slots therein, an adjusting-disk in the 115 same plane with said driving-wheel, having spiral slots adapted to engage with each of the said driving projections, ratchet-teeth on said driving projections, and a driving-chain operating on said driving projections having similar ratchet-teeth, substantially as speci- 120 fied.

4. The combination, with a driving and driven shaft and a connecting-chain passing over a suitable sprocket-wheel on one of said shafts, of an adjustable wheel or pulley hav- 125 ing driving projections extending laterally therefrom and operating in radial slots therein, a revolving disk provided with spiral slots adapted to engage with each of said spiral projections, ratchet-teeth on said chain and 130 similar teeth on said driving projections, and a tension device operating to take up or pay

out the slack of said chain as said projections are adjusted, substantially as specified.

5 5. The combination, with a wheel or pulley having radial slots, of driving projections in said slots adapted to be adjusted to or from the center of said wheel, said driving projections being formed with T-shaped heads, which, when turned to an unusual position, will pass through said slots and will be held  
10 against displacement therein when turned to their normal position, substantially as specified.

15 6. The combination, with a wheel or pulley having radial slots, of the driving projections with T-shaped heads operating in said slots, and an adjusting-disk having spiral slots in the same plane with said driving-wheel and adapted to turn in relation thereto, each of said driving projections having an extended  
20 portion to fit into one of said spiral slots, substantially as specified.

7. The combination, with a wheel or pulley having radial slots, of driving projections, each having a T-shaped head, and an extended portion projecting laterally from said wheel, 25 a disk in the same plane with said wheel and adapted to turn in relation thereto, spiral slots in said disk, one slot for each driving projection, each of said slots being adapted to engage with the extended portion of one of said  
30 driving projections, and means for holding said disk in different positions of adjustment with reference to said wheel, substantially as specified.

In testimony whereof I have hereunto set 35 my hand this 10th day of July, A. D. 1889.

CHARLES E. PATRIC.

Witnesses:

JOSHUA SCOTT,  
PAUL A. STALEY.