

L. SEARS,

2 Sheets, Sheet 1.

Straw Cutter.

No. 93235.

Patented Aug. 3. 1869.

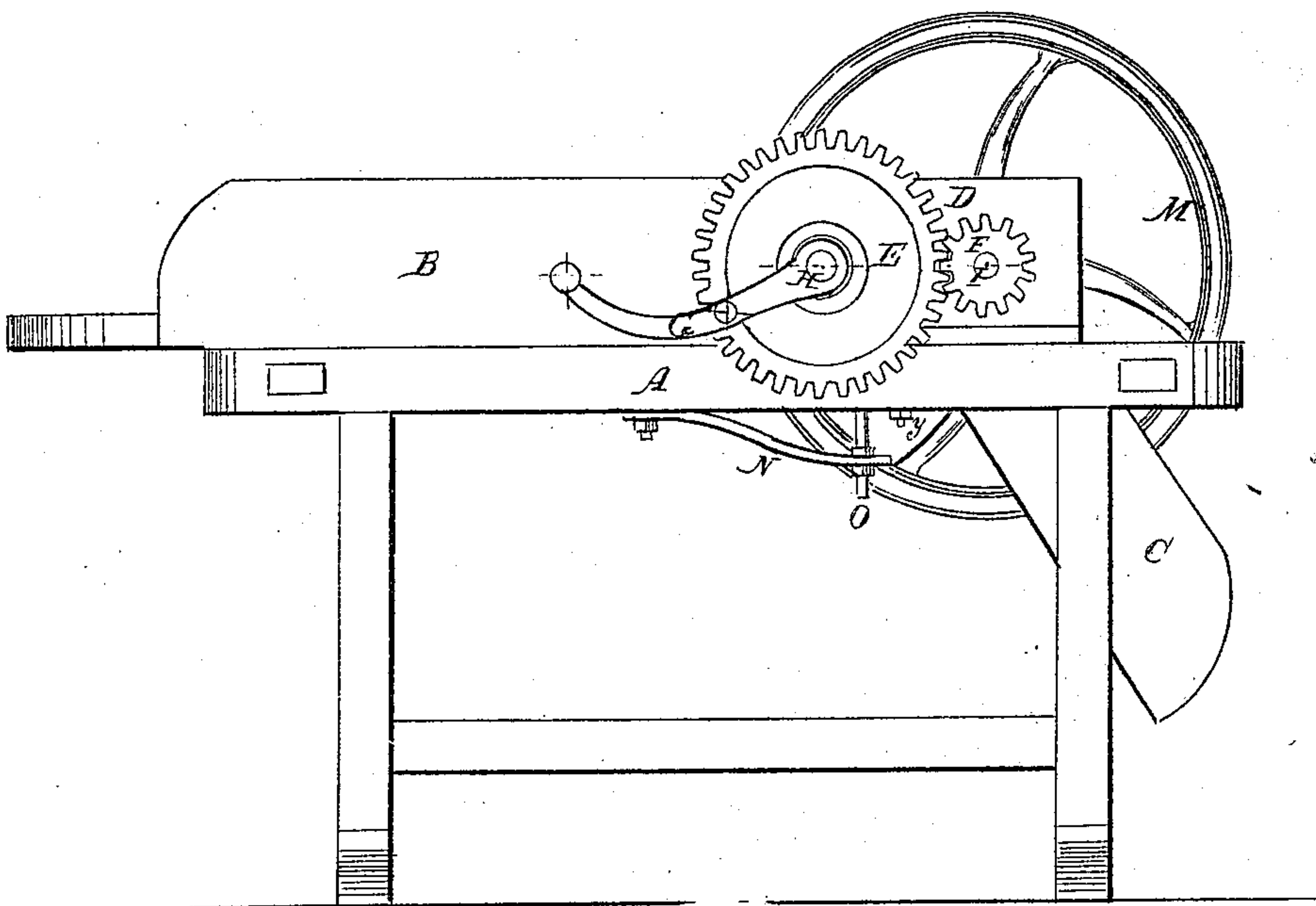


Fig 1.

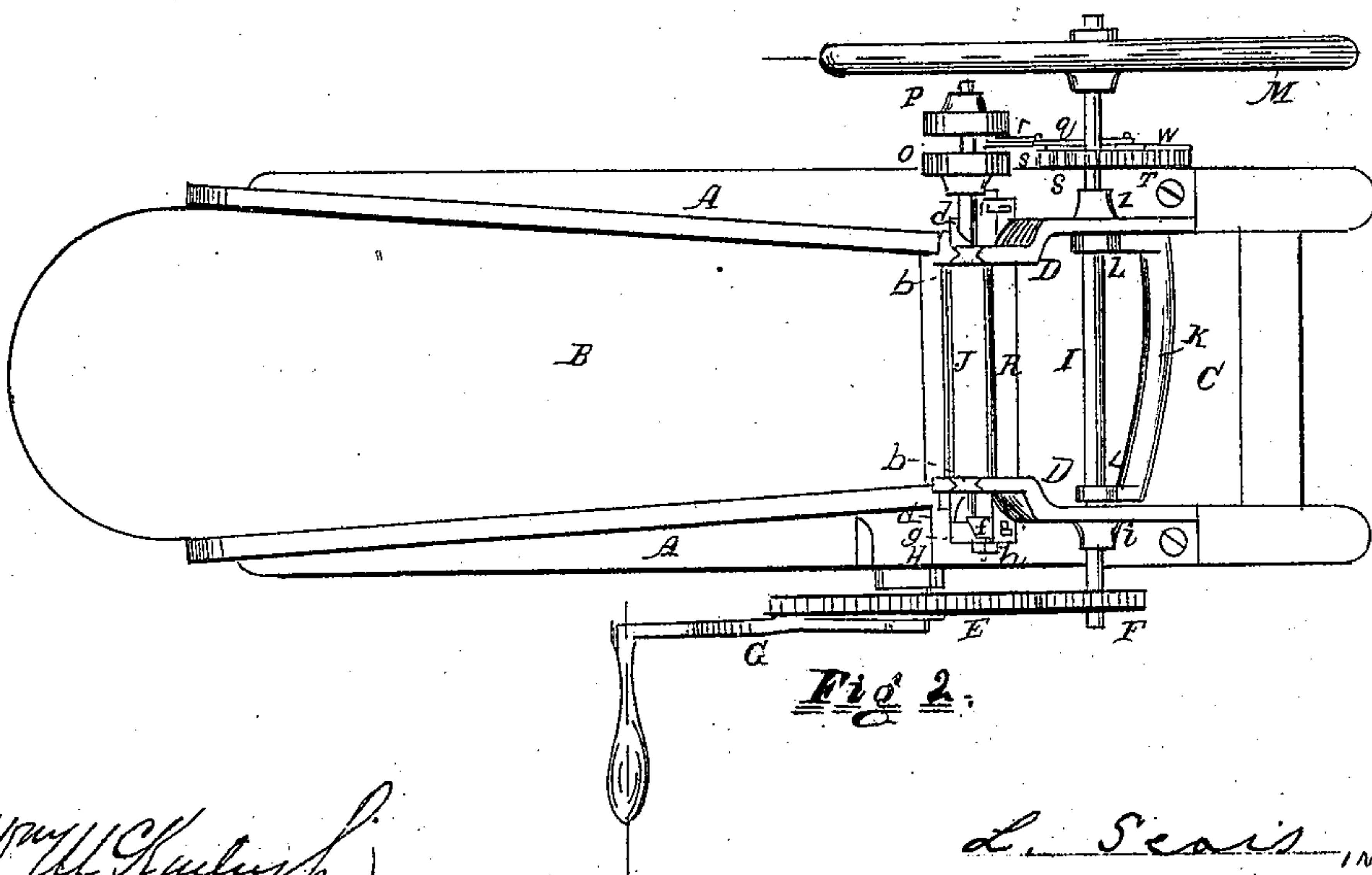


Fig 2.

Wm H. Kinsley  
at W. H. Kinsley  
WITNESSES

L. Sears INVENTOR.  
by J. A. Abbott ATTORNEY

# L. SEARS, Straw Cutter.

No. 93,235.

Patented Aug. 3. 1869.

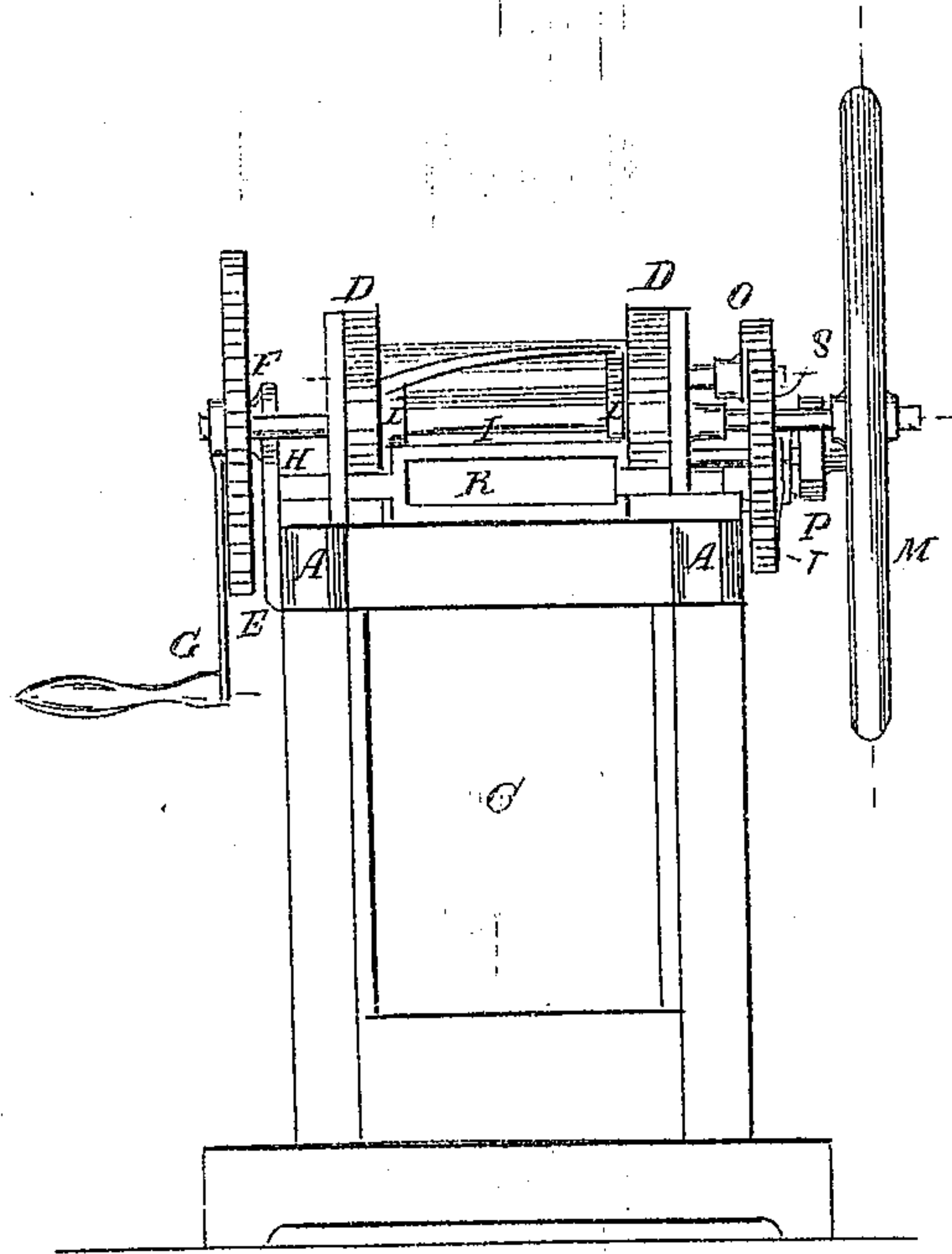


Fig 3.

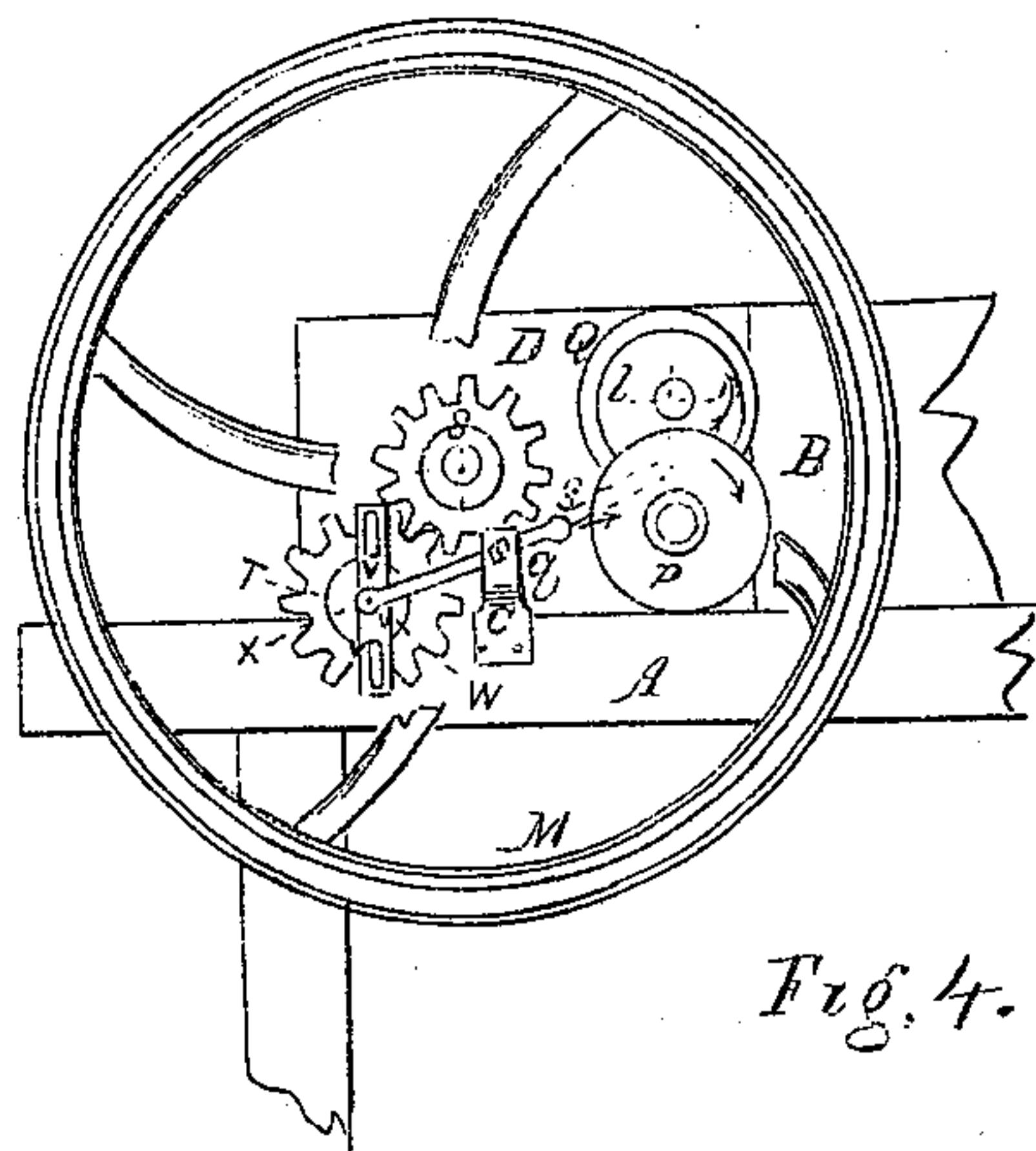
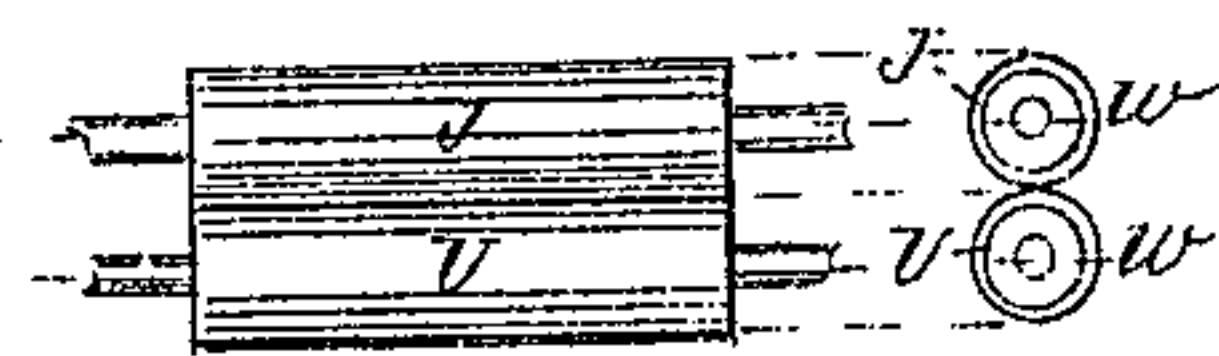
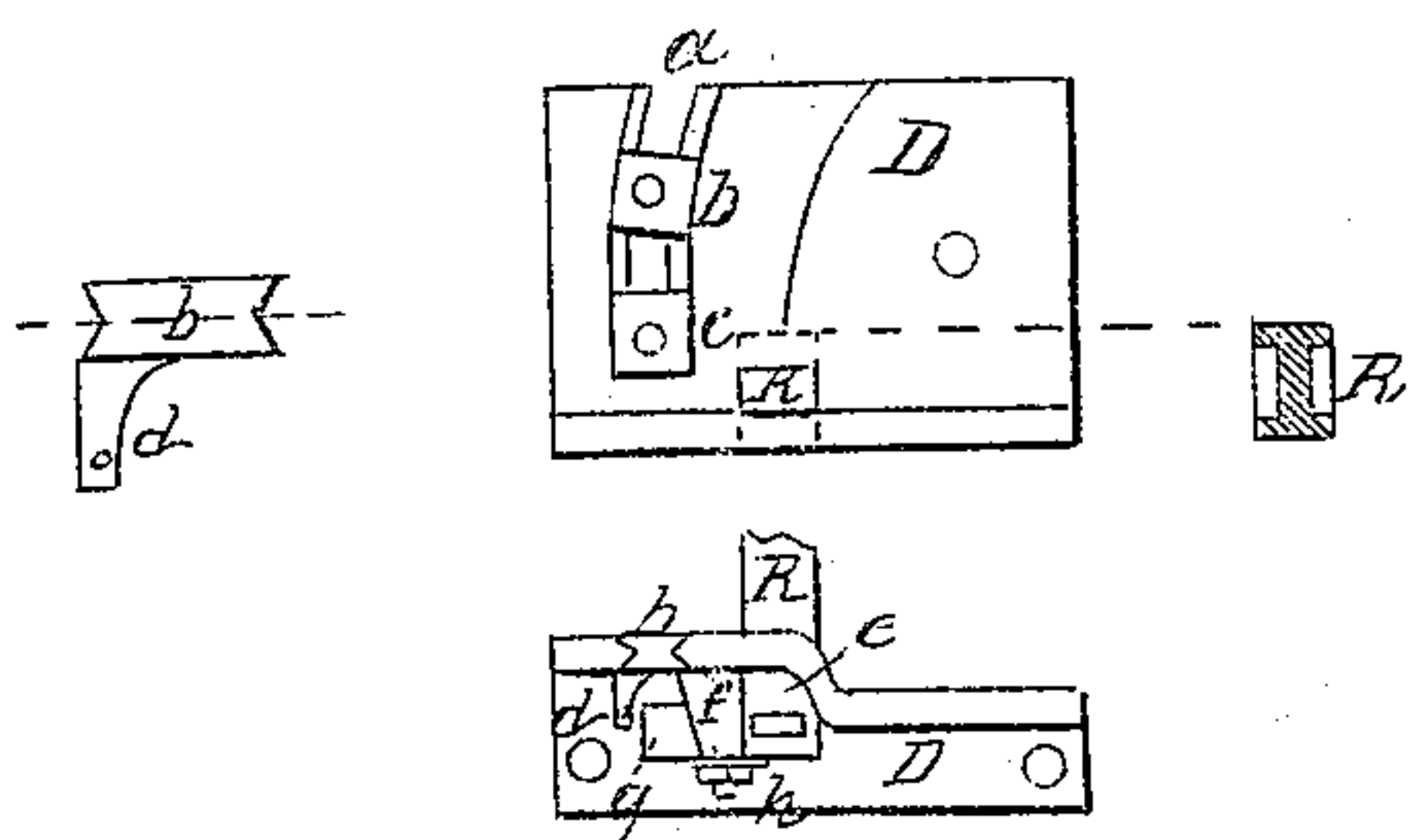


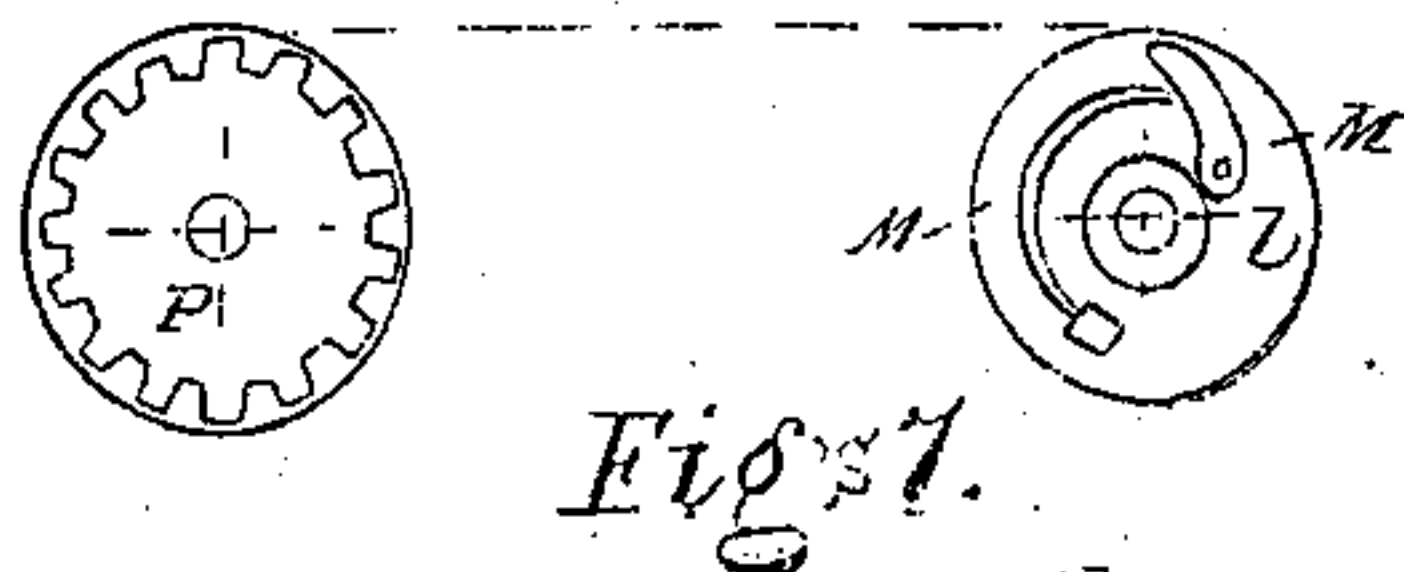
Fig. 4.



Figs. 5.



Figs 6.



Figs 7.

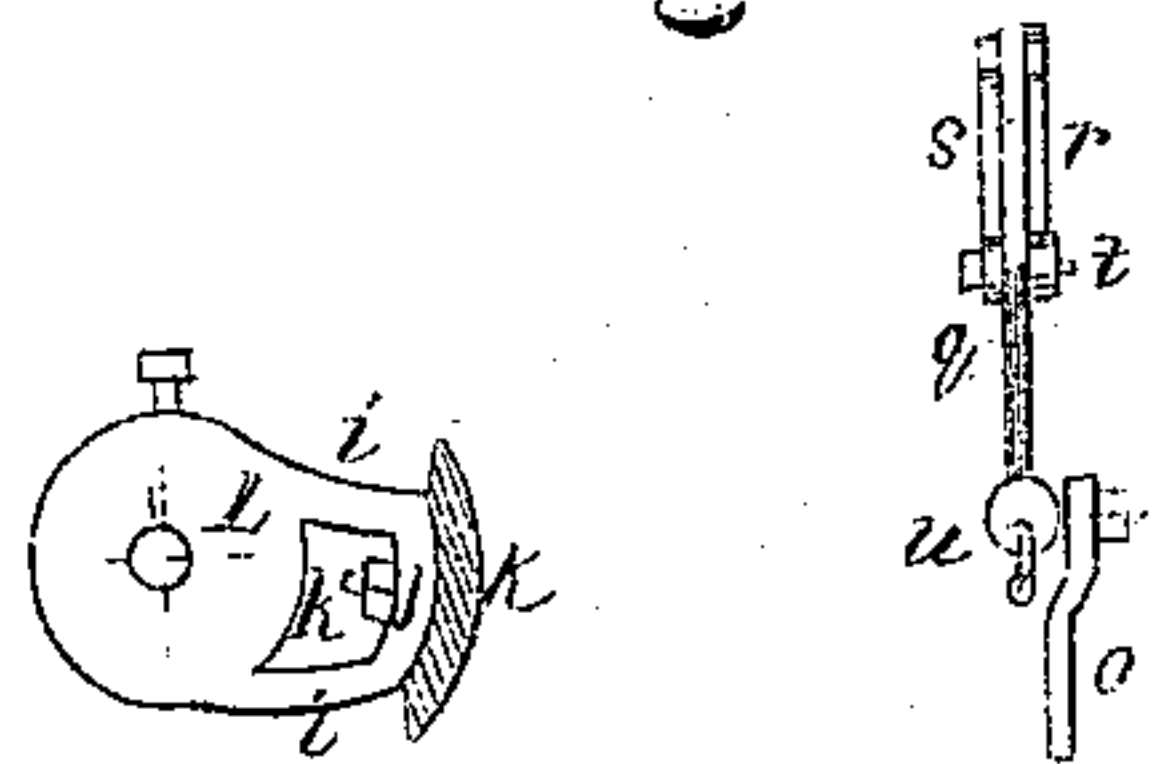


Fig 8.

Fig 9.

*Wm. H. Huley*  
*Atty. at Law*  
WITNESSES.

*L. Sears* INVENTOR.  
*J. Abbott* ATTORNEY.



# United States Patent Office.

L. SEARS, OF PERRYSVILLE, OHIO.

Letters Patent No. 93,235, dated August 3, 1869.

## IMPROVEMENT IN STRAW-CUTTERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, L. SEARS, of Perrysville, Ashland county, State of Ohio, have invented new and useful Improvements in Straw-Cutters; and I do hereby declare that the following is a full, clear, and exact description of my invention, reference being made to the accompanying drawings, forming part of this specification, and to the letters of reference marked thereon, of which drawings—

Figure 1 is a side elevation of my improved straw-cutter.

Figure 2 is a plan of the same.

Figure 3 is a front elevation of the same.

Figure 4 is a detail view of feed-mechanism.

Figure 5 are detail views of feed-rollers.

Figure 6 are detail views of side plates and cutter-bar mechanism.

Figure 7 are views of the faces of the ratchet-box wheels.

Figure 8 is an elevation of knife-bar arms.

Figure 9 is a side view of arms and joint, with connecting-rod and links of feed mechanism.

My invention relates to certain improvements in the construction of that class of cutters for cutting straw, hay, stalks, or other like material, which has a revolving knife, stationary cutter-bar, and an automatic feed-mechanism for bringing the straw or hay under the action of the knife; said improvements consisting in the novel construction of tension-device for the upper feed-roller; also, in the novel construction of the cutter-bar, and in the novel mode of securing the proper position of said cutter-bar; these several improvements making the machine very strong and durable in construction and perfect in its operation, making it easy to repair when worn or broken, not liable to any derangement from dirt, and of very easy and simple adjustment for different lengths of cut, or for different tensions on the feed-rollers, or for different positions of the cutter-bar.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and arrangement.

The frame of my machine is made of wood, in the general form shown, or of cast or malleable iron, if found desirable, and has the receiving-box B and discharge-box C, arranged as shown.

The side-plates D D are bolted to the side-pieces A A of the frame, and are provided with the roller-slots *a a*, and the boxes *z z*, in which is arranged the knife-shaft T.

A standard, H, is bolted to one of the side-pieces A, and has a journal secured at its head, on which is secured the gear-wheel E, provided with a crank, G.

This gear-wheel E meshes into the pinion F on the knife-shaft I, on which shaft are also secured the knife-arms L L and the gear-wheel S.

These arms L are constructed as shown in fig. 8, the arms *i i* and knife-bed *j*, being so arranged as to allow of the turning up of the nut on the bolt *k*, by which the knife K is secured to the bed *j*.

These arms may be secured to the shaft I by clamp-screws, as shown; or may be keyed on said shaft if desired.

The knife K is of the curved form shown in figs. 2, 3, and 8, the several parts of its cutting-edges and outer faces being at the same distance from the axis of the shaft I, and the spiral form of edge giving the knife a shearing cut.

A heavy fly-wheel, M, is keyed on the shaft I, and serves to insure a steady movement of the machinery.

The gear-wheel S, on the shaft I, meshes into a pinion, T, arranged on the journal on the side-piece A of the frame, which pinion has the cross-bar W secured on its face, by means of two screws or bolts which pass through the slots *v v* in the bar W, and screw into threaded holes in the pinion T, as shown in fig. 4.

In this cross-bar W is secured the crank-pin X, which is secured in a hole at the end of the connecting-rod *q*.

This connecting-rod *q* is arranged to slide back and forth in the pivoted arm *u*, which is arranged on a standard, *o*, on the side-piece A of the frame, as shown in figs. 4 and 9, and at the end of the connecting-rod *q* are secured the links *r* and *s*, by means of the bolt *t*, and these links are attached at their other ends, one to each of the inner wheels *l*, of the ratchet-boxes P and Q, on the shafts of the feed-rollers J and U.

The ratchet-boxes are composed of the outer wheel P, of the form shown in figs. 2 and 4, on the inner face of which is found the ratchet-teeth, as shown in fig. 7, and the inner wheel *l*, on the inner face of which is arranged the pawl *m*, together with spring *n*, by which the pawl *m*, is forced to engage with the teeth of the ratchet-wheel P.

The outer wheels P and Q are keyed on the shafts of the feed-rollers, while the inner wheels *l* are free to revolve on said shafts.

The feed-rollers J and U are composed of a central cylinder of wood or iron, which is covered by a rubber or gutta-percha covering, *w*, which can be cemented or tacked on to the central cylinder, and which effectually prevents any slipping of the straw between the rollers.

The lower feed-roller U has its shaft arranged in boxes C C, which are slid down to the bottom of the grooves *a* in the side-plates D D, and are there stationary, while the shaft of the upper feed-roller J is arranged in the boxes *b b*, which are free to slide up and down in the grooves *a a*.

The arms *d* are cast on these boxes *b b*, as shown



in detached plan in fig. 6, and a bolt, *o*, is passed through a hole at the end of this arm *d*, where it is secured by jam-nuts or their equivalents, and passes down through a hole in the flange of the side-piece *D*, and the side-pieces *A*, into a spring, *N*, secured on the under side of the side-pieces *A*, where it is secured by jam-nuts, as shown in fig. 1.

The knife-bar *R* is of the general form shown in fig. 3, and in detached cross-section in fig. 6, and is secured to the side-plates *D D*, by bolts *y y*, one end of one of said bolts being shown in fig. 1, which pass through the slots *e e* at the ends of the cutter-bar, (see fig. 6,) and through the flanges of the side-plates *D D*, down through the side-pieces *A A*, on the under side of which they are secured by nuts, as shown.

An arm, *g*, is cast on the flange of the side-plates *D*, and a wedge-shaped presser-block, *f*, is arranged between said arm and the end of cutter-bar *D*, as shown in plan in fig. 6.

The nut *h* is arranged on a bolt at the end of the presser-block *f*, and has a bearing on a washer, which bears on the end of cutter-bar *R*, and the arm *g*, so that by tightening the nut *h*, the wedge-shaped presser-block *f* is drawn forward and the cutter-bar pressed toward the cutting-knife *K*.

From the foregoing description of the general construction of my improved cutter, the manner of adjusting and operating the same is readily seen.

The straw to be cut is put in the box *B*, and the height of the upper feed-roller *J* is so adjusted by means of the jam-nuts on the rod *O*, at the spring *N*, as that there shall be a small space left between the rollers *J* and *U*, so that when the straw is brought up to said rollers, and they are caused to revolve, the straw shall enter and be drawn forward between them.

The cutting-knife *K* is secured to the arms *L L*, with either edge as the cutting-edge, so that as one edge becomes worn, it can be reversed, and the opposite edge be brought into action.

From the peculiar cross-section of the cutter-bar *R*, it is evident that it has four edges, either one of which can be used in connection with the knife *K* as a cutting-edge, and that in case its edges become worn, or in any way get out of their correct straight form, they can readily be ground up; the peculiarity of the double *T* cross-section of the cutter-bar, consisting in the fact that in order to "true up" the edges of said cutter-bar, it is only necessary to grind away the ends of the *T*'s, instead of grinding down the whole face of the bar, as would be the case were the bar made of a rectangular cross-section, whereby a great saving of grinding is effected.

To adjust the cutter-bar, the nuts on the bolts *y y* are loosened, and the cutter-bar is slid forward or backward until the cutting-knife *K* will just cut past the edge of the bar *R*.

The bolts *y y* are then tightened, and the nuts *h* on the presser-blocks *f* are turned up until said pressers are brought to bear firmly against the cutter-bar *R* and the arms *g g*, which, as is readily seen, will prevent any backward movement of the bar *R*.

To adjust the feed-mechanism, the binding-screws which pass through the slots *v v* of the cross-bar *W*, of the pinion *T*, are loosened, and said cross-bar is slid into such a position as that the distance of the crank-pin *X* from the axis of the pinion *T*, shall be

equal to one-half the length of the required cut of feed.

Now the revolution of the pinion *T*, caused by the revolution of the shaft *I* and gear-wheel *S*, will cause a reciprocating movement of the connecting-rod *q*, the forward movement of which, indicated by arrows in fig. 4, will cause a movement of the inner wheels *l l* of the ratchet-boxes *P* and *Q*, as indicated by arrows, which will cause the pawls *m m*, of the inner wheels *l l*, to advance along the teeth of the outer wheels *P* and *Q*, while the backward movement of the connecting-rod *q* will cause a forward movement of the ratchet-boxes *P* and *Q*, and consequently of the feed-rollers *J* and *U*, as in this back movement of the connecting-rod, the pawls *m m* lock into the teeth of the outer wheels of the ratchet-boxes, instead of sliding over them, from which it is readily seen that the straw will be drawn up under the action of the knife *K*, and cut into pieces of the required length.

Having thus fully described my invention,

What I claim therein as new, and desire to secure by Letters Patent, is—

1. The cross-bar *W*, provided with the slots *v v* and crank-pin *X*, when used in combination with the pinion *I*, for the purpose of adjusting the length of cut for the straw, substantially as is herein specified.

2. The combination of the ratchet-boxes *P* and *Q*, links *r* and *s*, and connecting-rod *q*, cross-bar *W*, with crank-pin *X*, and slots *v v*, and pinion *T*, the several parts being arranged substantially as and for the purpose herein specified.

3. The standard *o*, with pivoted arm *u*, when used in combination with the side-piece *A*, and connecting-rod, *q*, substantially as and for the purpose herein specified.

4. The sliding feed-roller box *b*, provided with an arm, *d*, when used in combination with the rod *O*, provided with jam-nuts at its lower end, and the spring *N* on the side-piece *A*, substantially as and for the purpose specified.

5. The cutter-bar *R*, when constructed with the double *T* cross-section herein shown, substantially as and for the purpose specified.

6. The presser-block *f*, provided with the tightening-nut *h*, when used in combination with the arm *g*, and end of cutter-bar *R*, substantially as and for the purpose specified.

7. The combination of the cutter-bar *R*, provided with the slots *e e* and clamping-bolts *y y*, side-plates *D D*, provided with the arms *g g*, side-pieces *A A*, and pressure-block *f f*, with the tightening-nuts *h h*, the several parts being constructed and arranged substantially as and for the purpose herein specified.

8. The combination of the shaft *I*, having the cutting-knife *K* and gear-wheel *S* secured thereon, pinion *T* provided with adjustable cross-bar *W*, connecting-rod *q*, with links *r s*, ratchet-boxes *P Q*, feed-rollers *J U*, and cutter-bar *R*, with pressure-blocks *f f*, the several parts being constructed and arranged, with respect to each other, substantially as and for the purpose herein specified.

As evidence that I claim the foregoing, I have hereunto set my hand, in presence of two witnesses, this 21st day of April, 1869.

Witnesses:

C. H. MOREY,  
HORACE L. STEARNS.

L. SEARS.