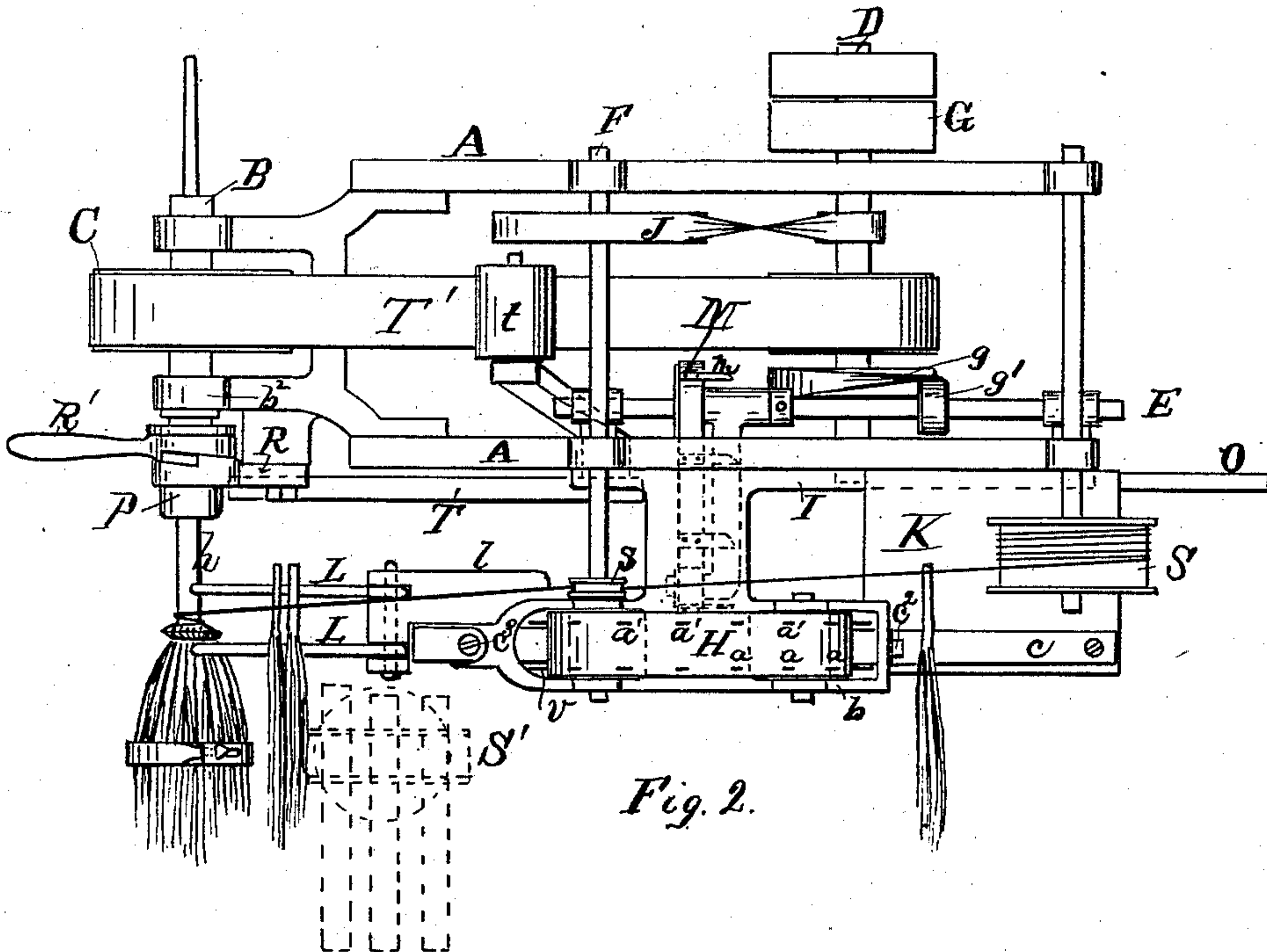
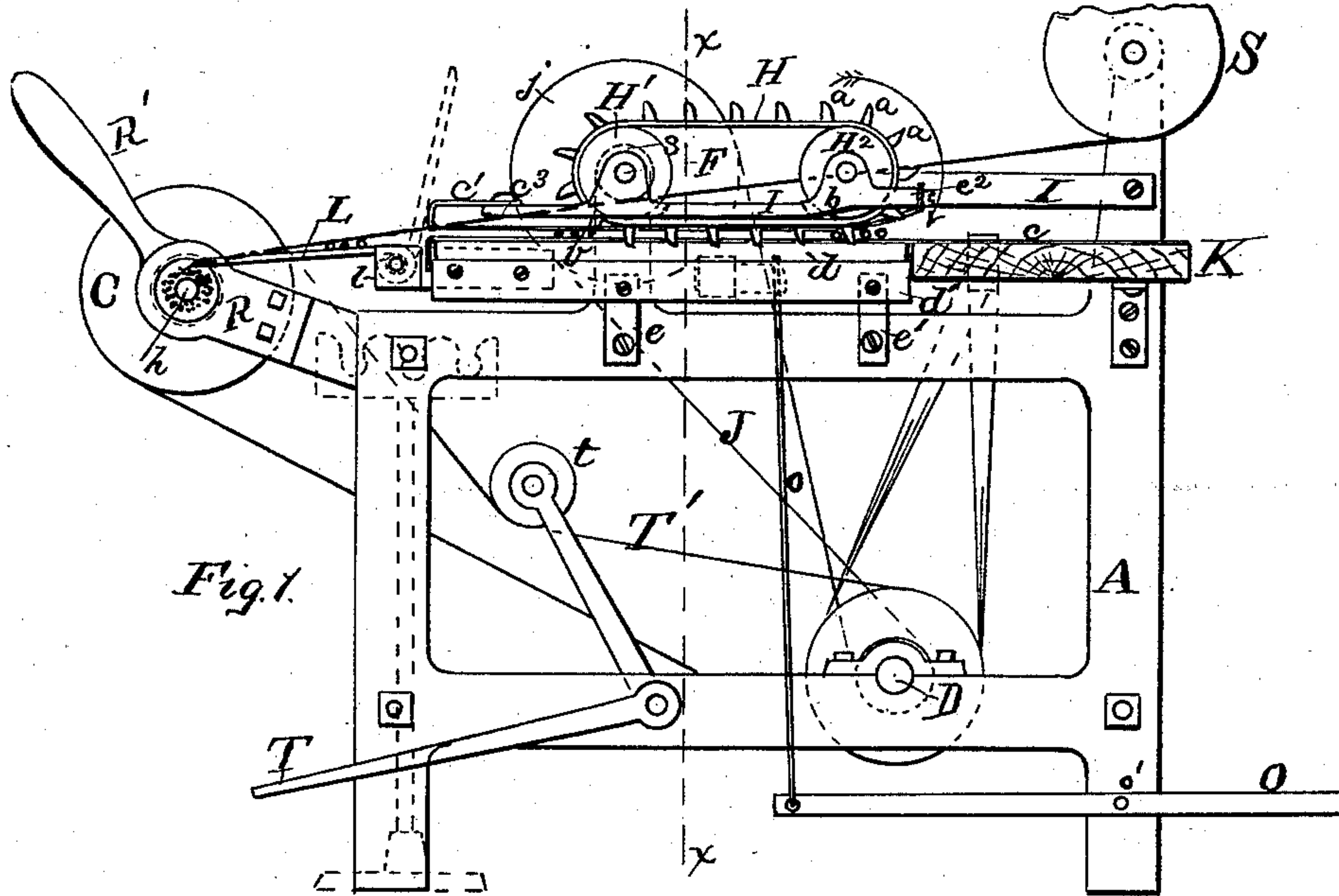


C. E. LIPE.
Broom-Winding Machine.

No. 222,141.

Patented Dec. 2, 1879.



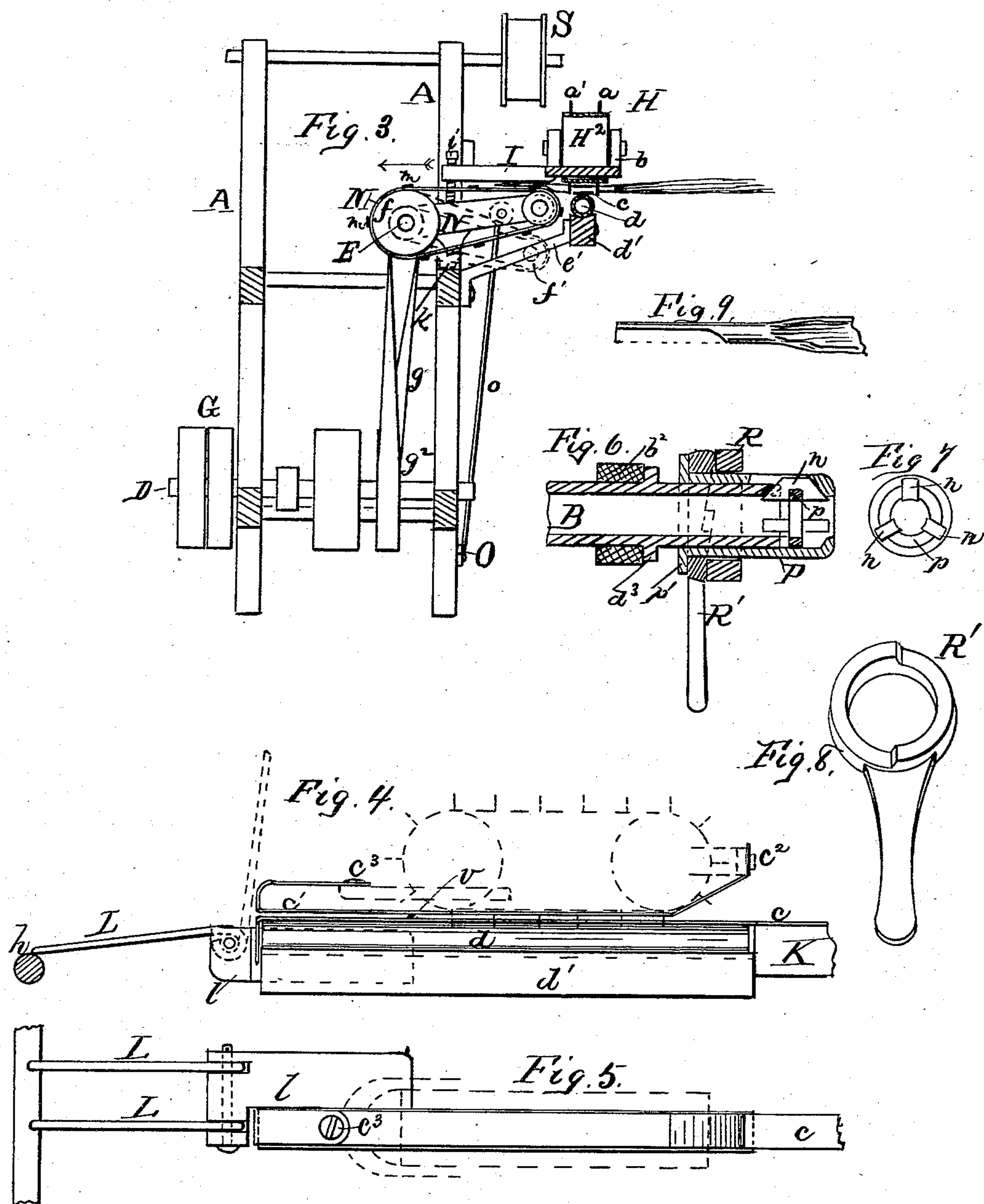
Witnesses
T. E. Hancock,
Charles Trautman.

Inventor
Chas E Lipe

C. E. LIPE.
Broom-Winding Machine.

No. 222,141.

Patented Dec. 2, 1879.



Witnesses
T. E. Hancock,
Charles Trautman.

Inventor
Chas E Lipe

UNITED STATES PATENT OFFICE.

CHARLES E. LIPE, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN BROOM-WINDING MACHINES.

Specification forming part of Letters Patent No. 222,141, dated December 2, 1879; application filed August 18, 1879.

To all whom it may concern:

Be it known that I, CHARLES E. LIPE, of Syracuse, in the county of Onondaga and State of New York, have invented a new and valuable Improvement in Broom-Winding Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference thereon.

This invention relates to that class of winding-machines that require two operators on each machine—namely, the feeder, who stands in the rear and prepares the several layers of corn in proper quantities for each broom, and the winder, who stands in front and places the prepared corn on the handle to form a broom; and it consists in certain devices for receiving and carrying the corn from the feeder to a position in front of the winder, and retaining it there in convenient shape until the winder applies it to the broom; also, in certain improvements for guiding the corn from the receiver directly on the handle and under the binding-wire, without being detached and applied in handfuls, as has been necessary in all machines hitherto in use for this purpose; also, in improved “spotting” devices, for spotting the covers as they proceed from the feeder to the winder; also, in an improved chuck for holding the handle firmly in the barrel while the broom is being built up.

In the annexed drawings, Figure 1 represents a side elevation of my improved machine; Fig. 2, a plan or top view; Fig. 3, a sectional view of the spotting and carrying devices, taken on the line *x x*, Fig. 1. Figs. 4 and 5 are enlarged views of the receiver and bridge. Figs. 6, 7, and 8 are detail views of the chuck, and Fig. 9, a view of a corn-spear after passing the spotter.

A A represent the frame of my machine, which is preferably made of cast-iron, and supports in front the hollow mandrel or broom-barrel B, which is fitted with a pulley, C, and chuck, to receive and hold the broom-handle. The main or driving shaft D is journaled to the frame near the floor to insure steadiness of motion, and, with proper pulleys and belt-

ing, it gives motion to the barrel B, the spotter-shaft E, and carrier-shaft F, power being applied to the pulley G.

The carrying and receiving devices are supported from one side of the machine sufficiently far away to allow the free passage of the corn, and will now be described.

The carrier or conveyer consists of an endless belt, H, upon which are arranged two rows of spurs, *a a a* and *a' a' a'*. This belt wraps around pulley H' fast on the shaft F, and around a similar pulley, H², running loose in a proper support, *b*, secured to the casting I. Motion is imparted to the carrier-belt in the direction of the arrow by means of the belt J and pulley *j*. The casting I projects from the frame outward between the pulleys H' and H² to the outside edge of belt H, and forms a backing to said belt to keep it from springing away from the corn in its passage along the receiver.

The receiver consists of two flexible metallic strips, *c c'*, which extend along the under side of the belt H between the rows of spurs *a* and *a'*. The upper strip, *c'*, is secured in the rear at *c²* to a part of the casting I, and in front at *c³*, also a projection from I. The lower strip, *c*, is fastened in the rear to the table K, and rests on a piece of rubber tubing, *d*, or other elastic substance, the front end being free and bent down over the end of tube *d*, as shown. A receptacle is thus formed open at both ends, through which the several layers of corn forming the broom may be transmitted in succession, subject only to the friction produced by the pressure of its flexible sides, and which holds it at any point along its path.

The tube *d* rests in a grooved strip, *d'*, said strip being supported on brackets *e e'* secured to the frame A.

Directly in front of the receiver are pivoted two fingers, L L, in a casting, *l*, fitted with jaws to receive their pivot ends. This casting is fastened to the front end of *d'*. The fingers in their normal position extend forward, their free ends resting on the broom-handle *h*, thus forming a bridge from the receiver to the handle, over which the corn is brought down underneath the binding-wire. When not in use they are thrown back to the vertical po-

sition, as shown by the dotted lines, resting against the receiver. These fingers may be arranged to slide back out of the way under the receiver, instead of swinging up, as described. I have used them made in this way, but prefer the plan shown.

The spotting mechanism is for the purpose of removing a portion of the stalk of the covers. A single cover with the stalk properly cut is shown in Fig. 9. This mechanism consists of an endless belt, *M*, having a series of knives, *m m*, fastened to it at proper intervals, running in the direction of the arrow over the pulleys *f* and *f'*. The driving-pulley *f* is fast on the shaft *E*, and derives its motion from the quarter-twist belt *g*, running over pulley *g'* (which is also fast on *E*) from pulley *g*² on the driving-shaft *D*. The outer pulley *f'* is journaled to the free end of a vibrating arm, *N*, which swings free upon the shaft *E*. Said arm *N* is limited in its upward movement by striking an adjustable stop, *i*, and downward by the projection *k* striking the frame *A*.

A rod, *o*, connects arm *N* with a foot-treadle, *O*, pivoted to the frame at *o'*, and extending to the rear convenient to be operated on by the feeder. When the treadle is depressed the arm *N* is thrown up against the stop *i*. The upper part of the belt *M* is horizontal and cuts across the path of the corn coming along the receiver. The stop *i* is made adjustable, so that much or little may be trimmed off the stalk as may be desired. The under surface of the casting *I* prevents the stalks from lifting away from the spotting-knives.

The object of the vibrating arm *N* is to allow the spotter-belt to drop away from the path of the moving corn, when the "hurl" or outer covering of the broom is passed along the receiver, which will be hereinafter more fully explained.

The chuck for holding the handle in the barrel is shown in detail in Figs. 6, 7, and 8. It consists of three loose jaws, *n n n*, with both ends beveled, as shown. One end of the jaw is inserted in a short slot in the end of the barrel, the end of the slot being beveled correspondingly. The other end of the jaw bears against one end of a similarly-beveled slot in the sleeve *P*, the jaws being held in position with a tendency to open by a rubber ring, *p*, resting in notches cut in the jaws, as shown. A longitudinal movement of the sleeve toward the barrel causes the jaws to move bodily toward the center, the pressure being equal upon both beveled ends. To effect this movement, which requires considerable force to hold the broom-handle securely, an abutting ring, *R*, is bolted to the frame near the bearing *b*², concentric with the barrel and sleeve. The inside face of this ring is made into a spiral cam. A similar cam, *R'*, provided with a hand-lever and turning loose upon the sleeve *P*, is placed between the flange *p'* and ring *R*. These cams are so arranged that by turning the lever toward the operator, the sleeve is forced along the barrel, and the

jaws tightened upon the broom-handle. A collar, *d*³, upon the barrel prevents it from moving longitudinally with the sleeve. The jaws prevent the sleeve from turning on the barrel with which it revolves. It will be observed that this arrangement creates considerable friction between the flange *p'* and lever *R'*; also between the collar *d*³ and bearing. This is desirable, as it prevents the barrel from turning back when not in motion.

The treadle *T* and tightening-pulley *t* are arranged to tighten the loose belt *T'* when it is desired to move the barrel. The building up of the broom requires short intermittent movements of the barrel completely under control and subject to start and stop at the will of the operator. Practice has demonstrated this to be a very efficient device and admirably adapted to the purpose. Almost any speed may be obtained on the barrel by gaging the pressure on the treadle and allowing the belt to partially slip over the pulleys. The wire or cord is brought down from the reel *S*, under the guide-pulley *s*, which is free to move along and turn upon the shaft *F* to the handle, passing between the fingers *L L*. The requisite amount of tension is obtained by the use of a convenient friction-brake, a device common to all winding-machines, and therefore not shown in drawings.

The "underwork," or that part of a broom immediately around the handle, is composed of inferior corn and usually put on in three handfuls. A support, *S'*, having cavities for holding this corn, (shown in dotted lines in Figs. 1 and 2,) is upheld on a standard secured to the floor in a convenient position for the winder to reach, and is filled by the feeder, who steps around to the side of the machine for that purpose. All the different grades of corn used are held in racks convenient to the reach of the feeder.

The operation of the machine is as follows: The winder, securing a handle in the chuck, attaches the wire and reaching to the support *S'* transfers in succession to the handle the bunches of underwork placed there by the feeder. During this operation the bridge *L* is thrown up to the dotted position out of the way. The "shoulder" of the broom is next trimmed, when it is ready for the covers. While the underwork is being put on the handle, the feeder selects the proper quantity of covers for a broom, lays them on the table *K*, properly adjusted lengthwise, and pushes them forward between the strips *c c'* until the spurs on the conveyer, which is traveling in the direction of the arrow, catches them and transports them along to the front. As each succeeding spear arrives at the point *v* where the spurs leave it and pass up over the pulley *H'* it is pushed forward by the one following it, the last remaining at this point, the space from this one point to the end of the receiver being long enough to hold covers enough for one broom. These covers may be fed into the receiver singly or in handfuls as the feeder may choose,

provided they do not overlap each other. As they enter the receiver the feeder raises the spotter by pressing on the treadle O, which spots the moving covers and falls away by its own weight when the covers have passed and the treadle is released. The covers now rest in the front end of the receiver in a continuous sheet. The winder reaches forward and pulls either a part, or all of them if he be sufficiently expert, forward, striking the bridge L, which is thrown down upon the handle and broom, as shown. The bridge thus formed supports the covers on their way to the broom, being held down upon it by the wire. As the covers approach the handle the barrel is set in motion and the covers pass off the end of the bridge onto the handle securely bound by the wire. The wire and bridge form what may be termed a continuation of the receiver, the wire corresponding to the upper strip, *c'*, and the bridge to the lower one, *c*.

While the winder is putting on the covers the feeder is preparing the next layer of corn, generally hurl, which is passed through the receiver in the same manner as the covers, but without being acted upon by the spotter.

The action of the spotter, instead of being arbitrary as in all other machines using spotting mechanism, is made subject to the will of the operator, thus affording facilities for a greater range and variety of work than has been hitherto practicable on this class of machines.

The hurl being applied to the broom in the same manner as the covers, the bridge is thrown back and the broom finished in any desired manner. In the mean time the feeder is filling the support S' with under-work and the receiver with covers for another broom.

Some of the advantages of these improvements may be summed up as follows: The conveyer-belt being always in motion, it is always ready to take corn from the feeder and deposit it in front of the winder without further looking after. In all machines using carrying-belts that move intermittently, the winder, when he comes to put on the corn, will often find it out of his reach, when he must stop and move or cause it to be moved into position, thus losing a portion of his time which should be employed in his legitimate work. The combination of a receiver or device for holding the prepared corn with a bridge for conveying it directly on the handle, is an entirely new feature in winding-machines. The essential principle involved is, that the corn does not leave the control of some fixed portion of the machine. In all other machines the operator has to remove the corn entirely from the carrying devices before applying it to the broom. A great saving of time is hereby gained with the additional advantage that it requires less skill to operate, being more nearly automatic. The movable spotter allows all kinds of corn to be fed through

the same conveyer, only operating at will. It also spots the covers from the under side, the side which is placed next the handle. All other spotting devices operate from the upper side, thus necessitating turning the spotted corn all over before it can be applied to the broom.

The foot-treadle and tightening-pulley, although an old mechanical movement, is believed to be new in its application to this class of machinery.

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

1. The combination of the carrying-belt H with the corn receiving and holding strips *c c'*, one above the other, substantially as described, and for the purpose set forth.

2. In a broom-winding machine, a corn-receiver and holder composed of two parallel flexible strips, *c c'*, combined with the spring *d* and support *d'*, substantially as described, and for the purpose set forth.

3. In a broom-winding machine, a belt, M, provided with spotting-knives combined with a loose pulley, *f'*, turning on a movable journal, and a table or support for the broom-corn, adapted to move said spotting-belt to and from the path of the corn at will, substantially as described.

4. The combination of the treadle O, rod *o*, vibrating arm N, and portable pulley *f'*, arranged and combined with a spotting-belt, substantially as described, and for the purpose set forth.

5. In a broom-winding machine, a movable bridge or corn-guide, L L, suitably attached at one end to the corn-holder *c c'*, and adapted to be moved forward at will to connect the free end with the broom-handle and growing broom, for the purpose set forth.

6. The combination of the bridge-fingers L L, broom-barrel B, and corn-holder *c c'*, with the wire-spool S, whereby the binding-wire is caused to issue from and remain in contact with the corn while passing from the said holder to the broom.

7. In a broom-winding machine of the class specified, a continuous and uninterrupted corn carrying and holding device extending from the feeder's table K, in the rear to the broom-barrel and handle in front, composed of the carrying-belt H, parallel holding-strips *c c'*, bridge-fingers L L, and wire guide *s*, substantially as described and set forth.

8. The combination of the broom-barrel B, tightening-lever R', abutting ring R, sleeve P, and jaws *n n*, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHARLES E. LIPE.

Witnesses:

T. E. HANCOCK,

HENRY C. HOOKER.