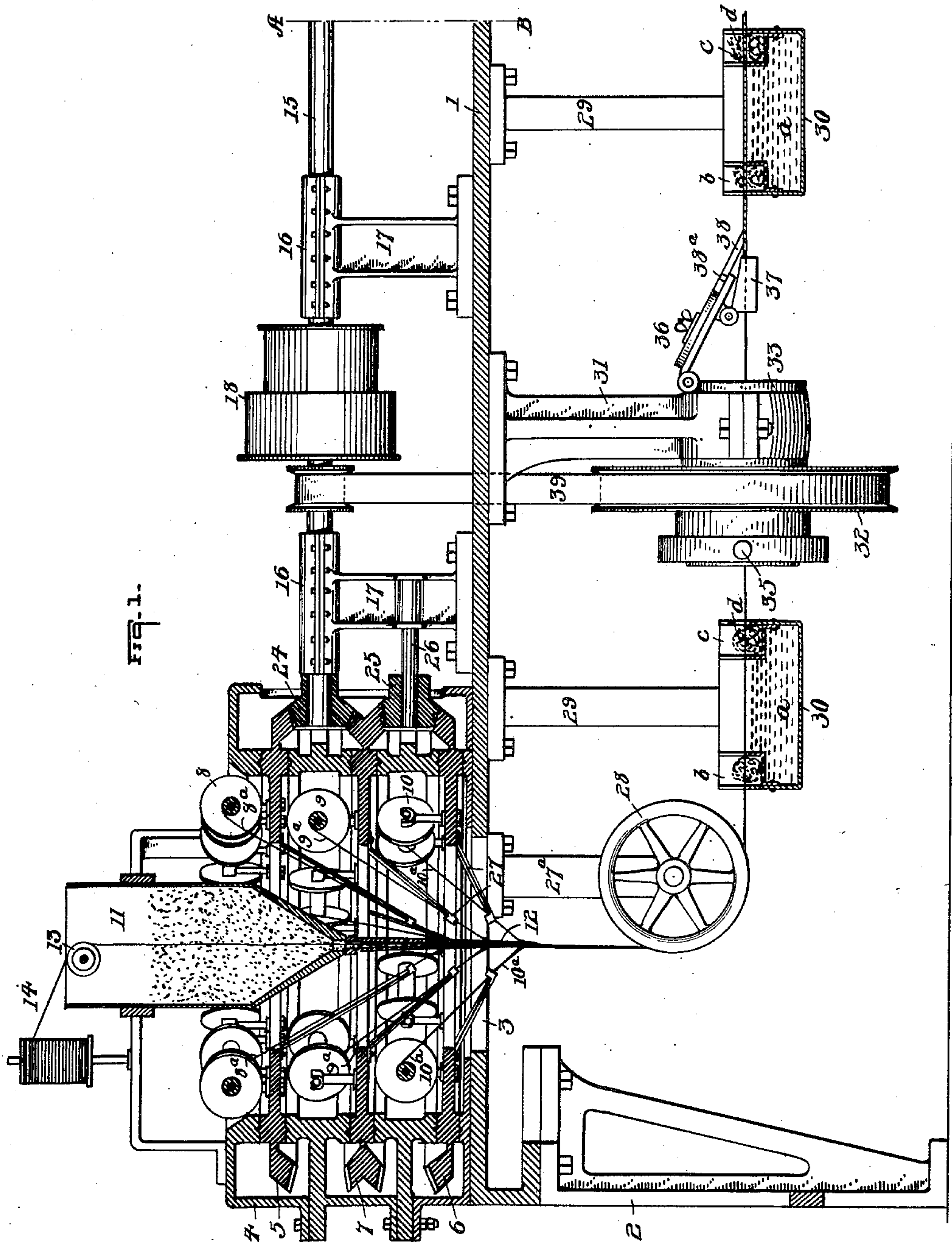


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C. E. SCHMUNK.
MACHINE FOR MAKING FUSES.
APPLICATION FILED AUG. 18, 1905.

Patented Dec. 14, 1909.
3 SHEETS—SHEET 1.



WITNESSES:

J. P. Appleman
Margaret Hughes.

INVENTOR

Charles E. Schmunk
by W. E. Doolittle

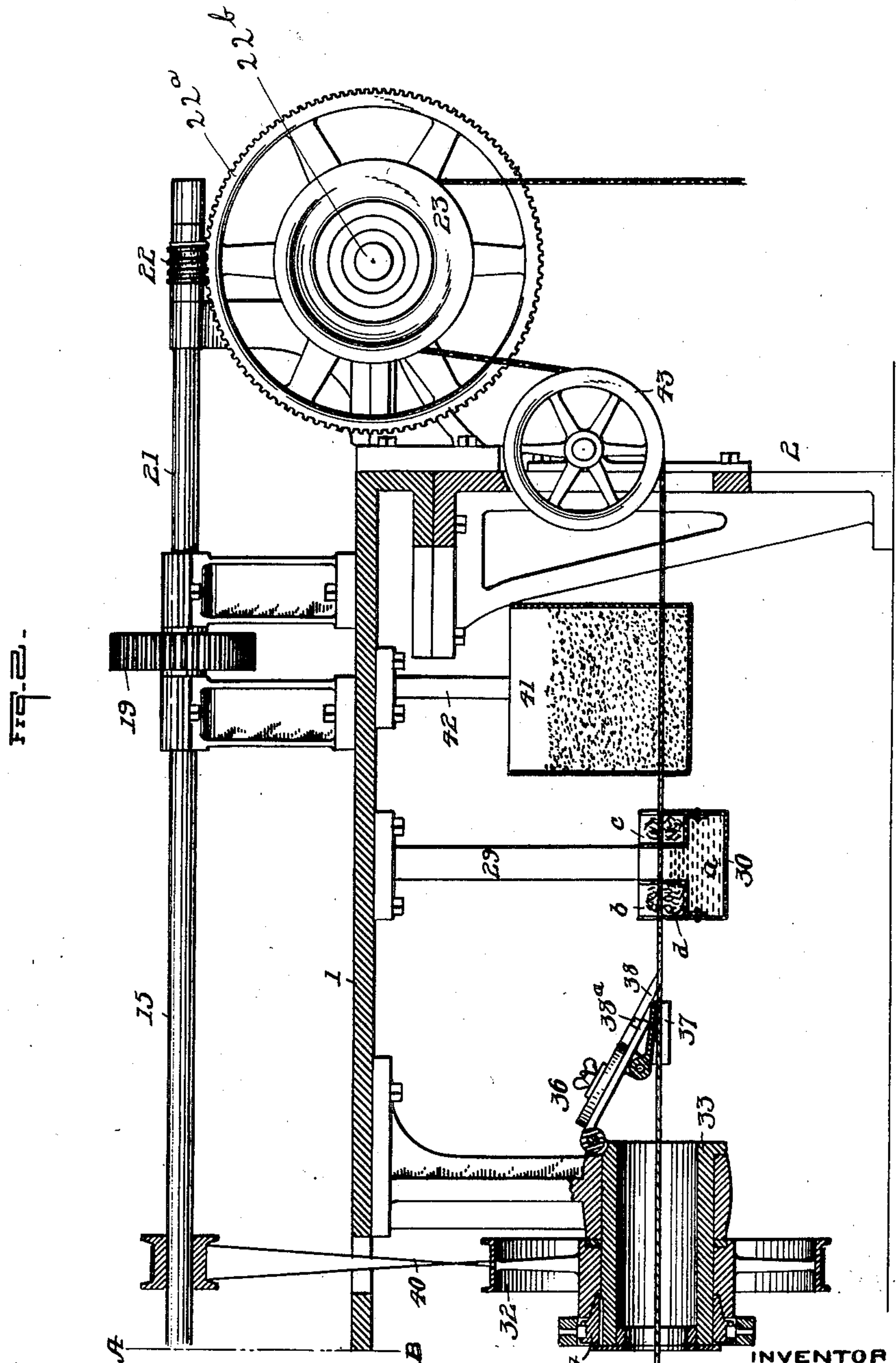
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WITNESSES:

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Margaret Hughes

INVENTOR

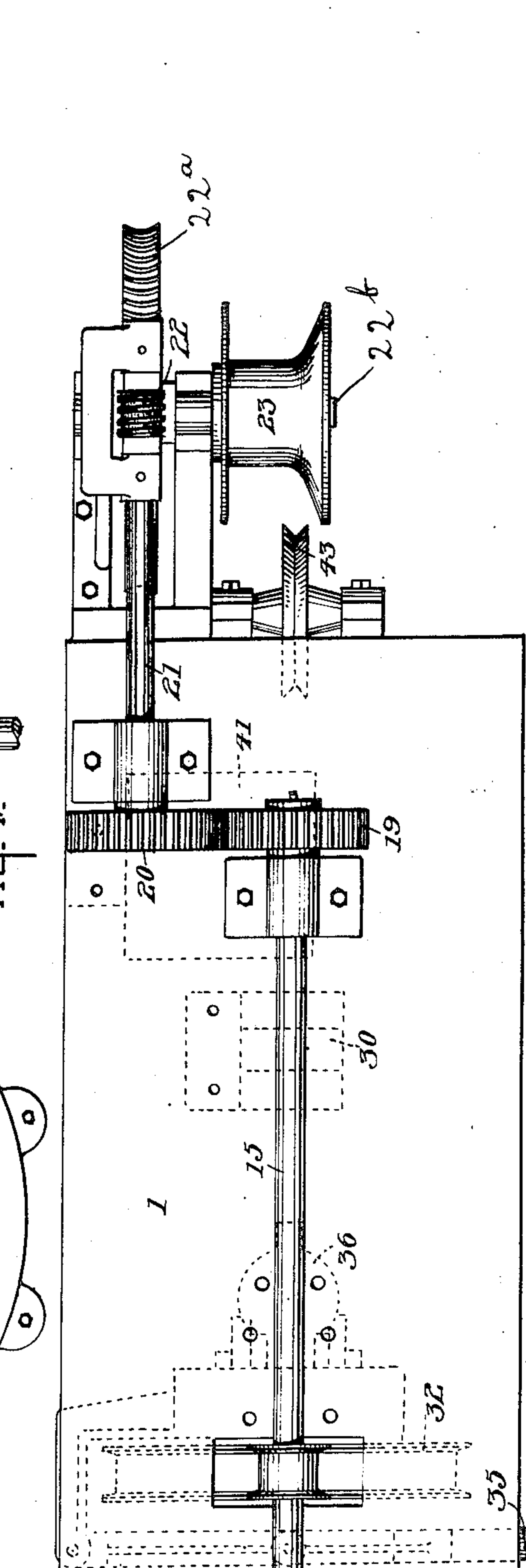
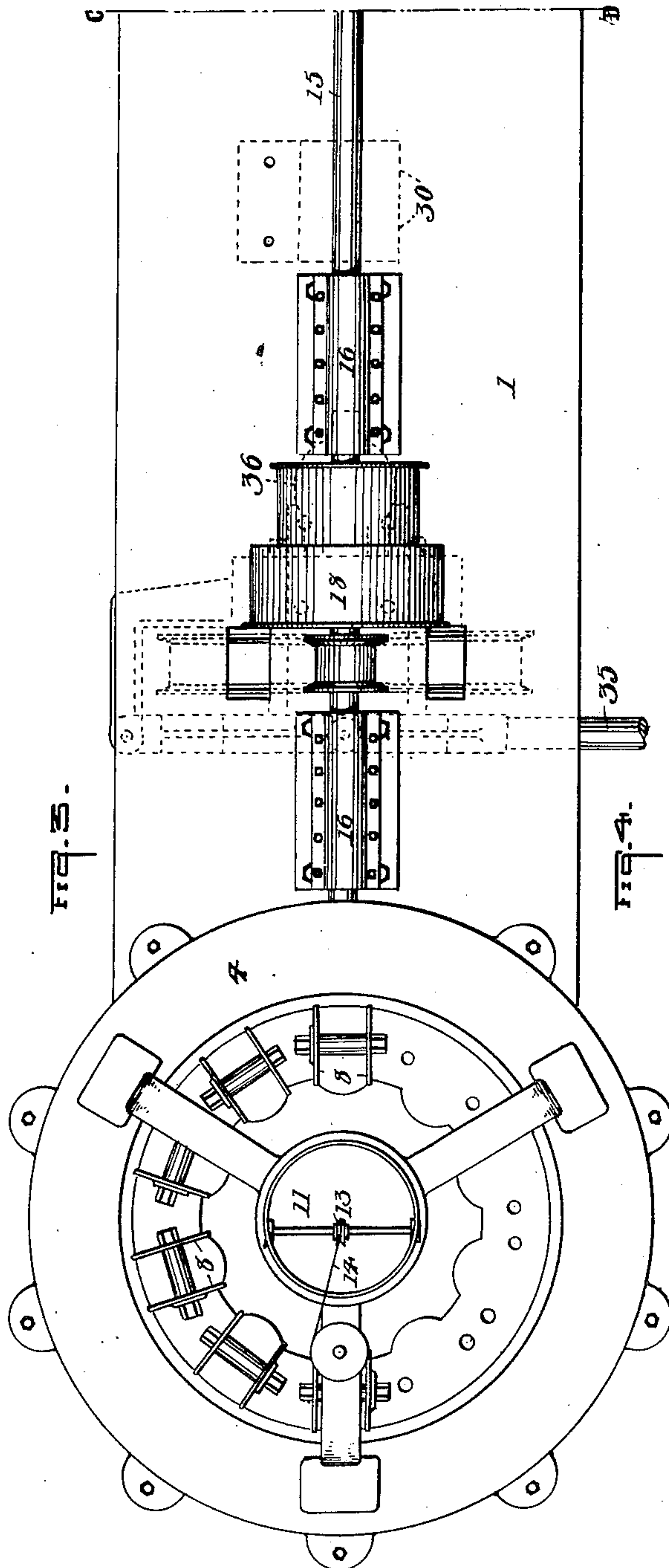
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES E. SCHMUNK, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO MARGARET SCHMUNK, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR MAKING FUSES.

942,938.

Specification of Letters Patent.

Patented Dec. 14, 1909.

Application filed August 18, 1905. Serial No. 274,711.

To all whom it may concern:

Be it known that I, CHARLES E. SCHMUNK, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Machines for Making Fuses, of which the following is a specification.

The object of my invention is to provide a new and improved fuse-making machine and to this end my invention consists, of a fuse-making machine, in the novel features of construction, and in the combination and arrangement of parts all as fully hereinafter described and claimed.

The present invention is particularly designed for the manufacture of various kinds of blasting-fuses. These blasting-fuses are commercially known as "double-tape fuse," consisting of a fuse-core, fifteen strands of thread, and two windings of tape; "single-tape fuse," a fuse-core, twenty strands wound thereon, and one winding of tape; and "cotton-fuse," comprising the fuse-core and fifteen strands of threads wound thereon.

In the accompanying drawings, which illustrate an application of my invention, Figure 1 is a central vertical sectional view of a portion of the machine constructed in accordance with my invention; Fig. 2 a view similar to Fig. 1, showing the remaining portion of the machine; Fig. 3 a top-plan showing part of the machine; and Fig. 4 a top-plan showing remaining portion of the machine.

Referring to the drawings, the machine, as illustrated and preferred, comprises a table 1, supported by legs 2. The table near one end is formed with an opening 3, and over this opening a casing 4 is located. This casing is preferably made in several parts secured together by bolts and the casing attached to the table.

Within the casing is a series of rotary-carriers, or, as particularly shown in the drawings, a series of beveled gear-wheels, consisting of upper wheel 5, lower wheel 6, and intermediate double-faced wheel 7. Mounted on these carriers 5, 6 and 7, and carried therewith, are three sets of bobbins 8, 9 and 10. In the upper set 8, I preferably employ ten bobbins, and in the intermediate and lower sets 9 and 10, five bobbins each. Extending downwardly into the casing and the carriers is a hopper 11, provided with a

former or nozzle 12, and located adjacent to the hopper and arranged to be drawn down through the hopper and former; over a small guiding-wheel 13 is a core-thread 14. The hopper 11 is designed to hold the material or materials, as the core-thread 14 and a suitable explosive, which constitute the fuse-core of the fuse.

Extending longitudinally up the machine is a driving-shaft 15. This shaft is supported by bearings 16 carried on uprights 17, which latter are attached to the table 1. Shaft 15, as illustrated, is designed to be driven by a belt, not shown, which extends over a cone-pulley 18. On the forward end of shaft 15 I employ a gear 19. Gear 19 meshes with a gear 20, mounted on a worm-shaft 21, and 22 designates a worm. Worm 22 meshes with worm-wheel 22^a carried upon a transverse shaft 22^b. Shaft 22^b has also mounted thereon a drum 23. The function of this mechanism is to impart a rotary movement to the drum 23. The means just described constitute a reeling-mechanism for drawing the materials through the machine in the operation of forming the fuse. Mounted on the opposite end of shaft 15 is the main-driving pinion 24. Pinion 24 meshes with the upper gear-wheel 5 and the upper-face of intermediate gear 7, and, as shown, is designed to revolve said gears 5 and 7, together with the two sets of bobbins carried on said gears, in opposite directions. Between the lower face of intermediate gear 7 and the lower gear 6 is an idler-gear 25. This idler 25 is mounted on a shaft 26 and is adapted to be shifted on said shaft for the purpose of throwing the lower-carrier 6 into and out of operation.

Attached to and extending downwardly from each rotary-carrier is a set of guide-arms 27. The function of these guides is to guide the strands from the bobbins to the former 12.

The threads or strands from the several sets of bobbins are designated by the reference characters 8^a, 9^a and 10^a.

Below the table and supported by a hanger 27^a, is a guide-pulley 28, over which the fuse-core and wound strands are drawn from the former. Also located below the table and supported by hangers 29 is a series of pitch-boxes or receptacles 30. Three of these pitch receptacles are shown and each is preferably of the form illustrated, that is

to say, the receptacles are divided into compartments *a*, *b* and *c*. The walls of the smaller compartments *b* and *c* are perforated for the purpose of permitting the passage of the fuse therethrough and also to permit the pitch contained in the larger compartment *a* to enter said smaller compartments *b* and *c*. In practice, I prefer to employ a sponge *d* in each compartment *b* and *c*, for the purpose of applying the pitch to the fuse.

Between the pitch-boxes are two tape-winding mechanisms, designed to cover the strands with one or two layers of tape. These mechanisms are supported from the table by means of hangers 31 and each comprises a pulley-wheel 32, mounted on a hub 33, a friction-clutch 34, the latter being operated by lever 35, and a tape-carrier 36. Tape-carrier 36 is hinged to hub 33 and is designed to revolve therewith. Secured to carrier 36 is a guide 37, through which the strands pass just prior to being wound with the piece of tape 38.

38^a designates a pulley formed on the tape-carrier.

Fig. 1 of the drawings shows the wheels, friction-clutch, etc., of the tape-winding mechanism in elevation, while in Fig. 2 I have shown this mechanism in section. The first tape-winding mechanism is driven by a straight-belt 39 and the second mechanism driven in an opposite direction by a crossed-belt 40. Belts 39 and 40 are driven from suitable pulleys carried on shaft 15. Beyond the last pitch-box is a receptacle 41, supported from a hanger 42. This receptacle is designed to hold a suitable powder through which the completed fuse is drawn before it reaches a pulley 43. Pulley 43 is employed to guide the finished fuse onto the drum 23.

While I have shown a preferred embodiment of my invention in the construction illustrated by the drawings, I do not desire to limit myself to that particular construction, for various modifications may be made in the construction illustrated without departing from the scope of my invention.

With the machine described, I am enabled to produce any or all of the several kinds of blasting-fuses now so generally sold and heretofore mentioned, in an economical and satisfactory manner. I am further enabled to produce fuses differing in construction from those described by changing the number of bobbins carried by the rotary-carriers and by varying the number of tape-winding mechanisms.

What I claim is:

1. A fuse-making machine having a hopper, a hollow stationary former in open communication with the hopper and adapted to receive the fuse-core materials, means for supporting a core thread and means for causing the core thread to be drawn down

through the former together with other material constituting the fuse-core, an upper rotatable carrier having a central-opening, a lower rotatable carrier having a central-opening, an intermediate rotatable carrier having a central-opening, each arranged to revolve around the former, said hopper extending through the upper carrier and the former through the intermediate and lower carriers, a set of bobbins mounted on each carrier, downwardly extending arms attached to each carrier for guiding strands from the bobbins to former, means for revolving the upper and intermediate carriers in opposite directions, a casing inclosing the carriers and bobbins, and a reeling-mechanism.

2. A machine for making fuses having a hopper, a hollow stationary former leading from the hopper, a plurality of rotary carriers each formed with a central opening and arranged to revolve around the former, said carriers located in different horizontal planes, a set of bobbins mounted on each carrier, downwardly extending arms attached to each carrier and extending through the openings of the carriers for guiding strands from each set of bobbins to the former, means for revolving the carriers, a casing inclosing the carriers and bobbins, a fuse-reeling-mechanism, a tape-winding mechanism, and a common driving-shaft for the carrier, fuse-reeling-mechanism and tape-winding-mechanism.

3. A fuse-making machine having a hopper, a stationary former leading from the hopper, an upper geared rotatable carrier having a central opening, a lower geared rotatable carrier having a central-opening, an intermediate geared rotatable carrier having a central-opening all arranged to revolve around the former, said hopper extending through the upper carrier and the former through the intermediate and lower carriers, a set of bobbins mounted on each carrier, downwardly extending arms attached to each carrier for guiding strands from the bobbins to the former, means meshing with the gears of the carriers for revolving the upper and lower carriers in the same direction and the intermediate carrier in an opposite direction, a casing inclosing the carriers and bobbins, and a reeling-mechanism.

4. A fuse-making machine having a hopper, a stationary former leading from the hopper, an upper geared rotary-carrier, a lower geared rotary-carrier, an intermediate geared rotary-carrier, all arranged to revolve around the former, a set of bobbins mounted on each carrier, means for guiding the strands from the bobbins to the former, means meshing with the gears of the carriers for revolving the carriers, means for throwing the lower carrier and its bobbins

into and out of operation, and a reeling mechanism.

5 5. A fuse-making machine having a hopper, a stationary former leading from the hopper, a plurality of rotary-carriers arranged to revolve around the former, a set of bobbins mounted on each carrier, means for guiding strands from the bobbins to the former, means for revolving the carriers, 10 tape winding mechanisms comprising a wheel, a friction clutch and a tape-carrier, means for revolving the tape-winding mechanisms in opposite directions, and a reeling mechanism for drawing the wound strands 15 off the former and through the machine.

6. A fuse-making machine having a hopper, a former leading from the hopper, a gear-wheel arranged to revolve around the former, a set of bobbins mounted on the 20 gear-wheel, means for guiding strands from the bobbins to the former, means for revolving the gear-wheel, comprising a driving-shaft and a pinion mounted on the shaft, said pinion arranged to mesh with the gear- 25 wheel.

7. A fuse-making machine having a hopper, a former leading from the hopper, an upper-gear, a lower-gear, an intermediate double-faced gear, a set of bobbins mounted

on each gear, means for guiding strands 30 from the bobbins to the former, a driving-shaft having a pinion meshing with the upper-gear and with one geared-face of the intermediate gear, and an idler adapted to mesh with the lower gear and one face of the 35 intermediate gear.

8. A fuse-making machine having means for effecting with respect to a traveling core a complete fuse, comprising a reeling-mechanism, a hopper, a stationary former leading 40 from the hopper, a plurality of rotary carriers arranged to revolve around the former, a set of bobbins on each carrier, means for guiding strands from the bobbins and winding the same on the former, a pitch-box in 45 the line of travel of the core and through which the wound strands are drawn, a mechanism for winding tape on the pitched and wound strands comprising a wheel, a tape-carrier adapted to revolve with the wheel, 50 and means for driving the reeling-mechanism, carriers and tape-winding mechanism.

In testimony whereof I affix my signature, in presence of two subscribing witnesses.

CHARLES E. SCHMUNK.

Witnesses:

W. G. DOOLITTLE,
MARGARET HUGHES.