No. 749,932. PATENTED JAN. 19, 1904.

D. H. HILL.

STOP MOTION FOR KNITTING MACHINES.

APPLICATION FILED OCT. 3, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

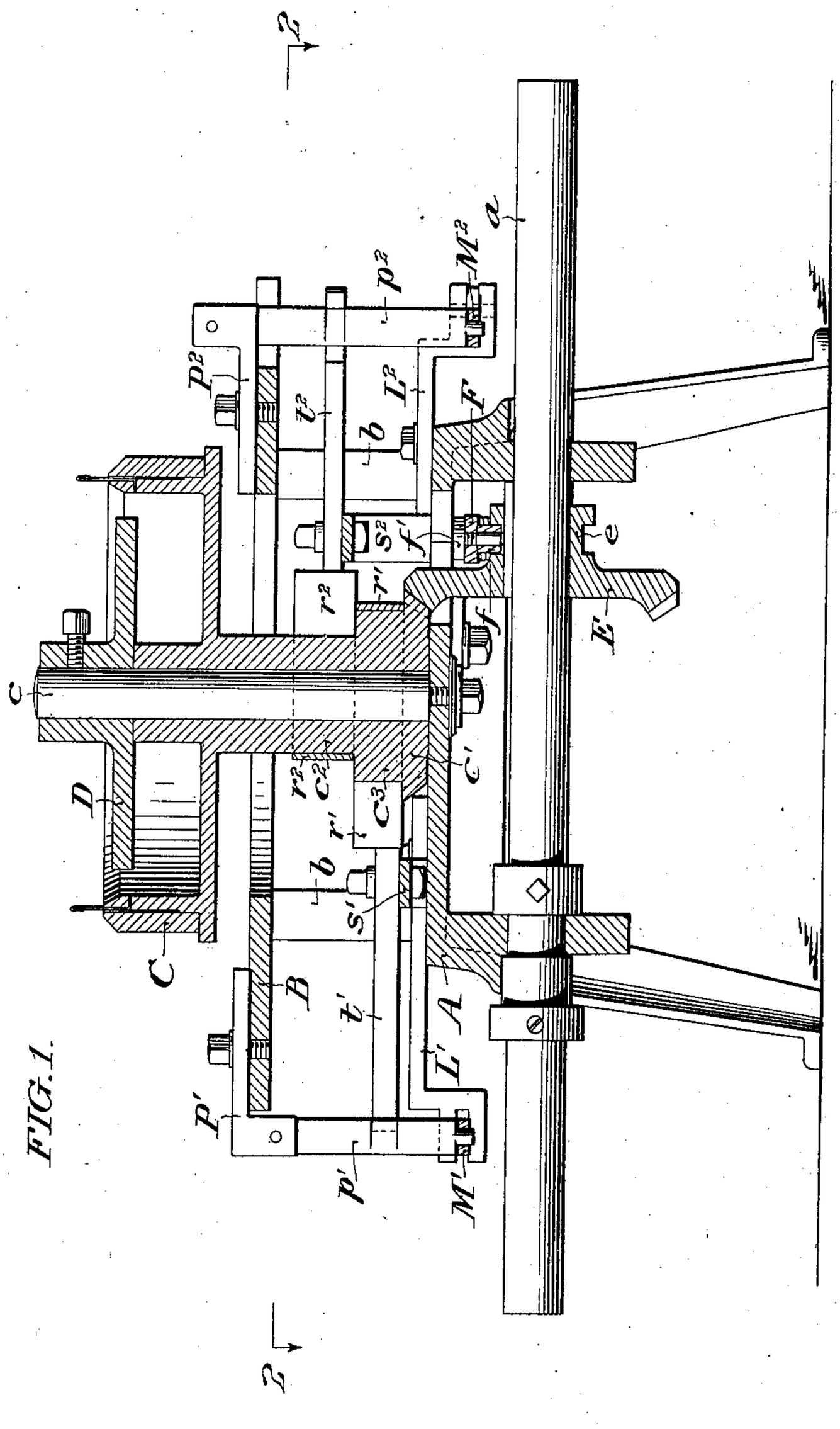

FIG. 1.

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INVENTOR:

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NO MODEL. 2 SHEETS—SHEET 2.

FIG. 2.

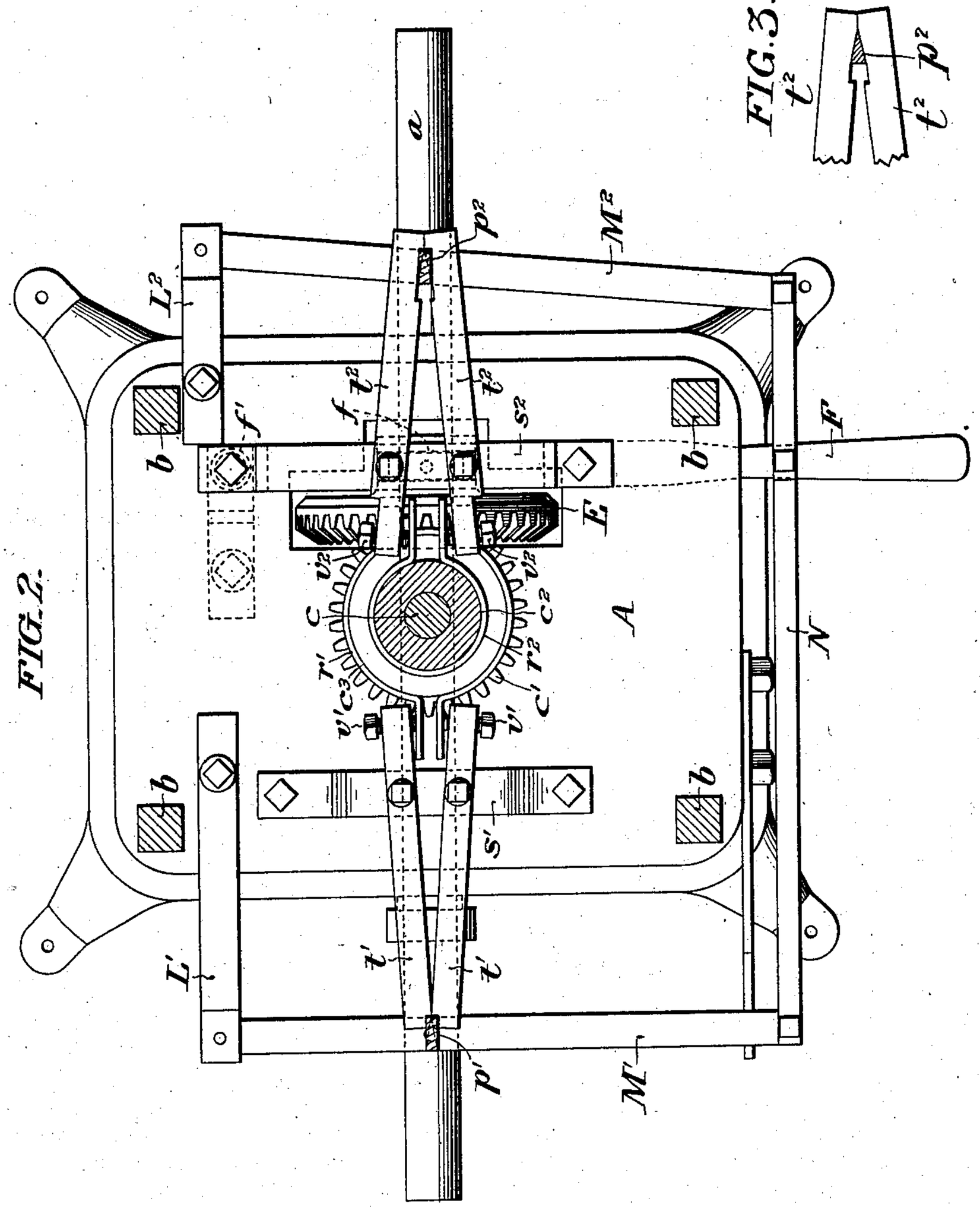

FIG. 3.

WITNESSES:

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No. 749,932. Patented January 19, 1904.

UNITED STATES PATENT OFFICE.

DAVID HASTINGS HILL, OF PHILADELPHIA, PENNSYLVANIA.

STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 749,932, dated January 19, 1904.

Application filed October 3, 1901. Serial No. 77,352. (No model.)

To all whom it may concern:

Be it known that I, DAVID HASTINGS HILL, a citizen of the United States, residing at No. 265 Diamond street, in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Stop-Motions for Knitting-Machines, whereof the following is a specification, reference being had to the accompanying drawings.

Difficulty has been experienced, as is well known to those skilled in the art of knitting, with all of the stop-motions (whether automatic or manual) which are usually attached to knitting-machines by reason of the fact that after the operation of the stop-motion has released or disconnected the moving parts of the knitting-machine from the driving-shaft the revolving parts of the knitting-machine will still continue to revolve for a time by reason of their momentum. This difficulty is greater with large knitting-cylinders than with small, because their greater weight increases the momentum. If the machine continues to revolve after the breaking of a thread, the difficulty of repairing the fabric is greater the longer the revolution of the machine has continued.

My present invention has for its object the prevention of this continued revolution of the machine; and to this end it consists in a frictionally-operating pressure which is applied to the revolving parts of the knitting-machine when by the operation of the stop-motion the driving power is disconnected therefrom.

The problem of applying a quick-acting brake to the revolving parts of a circular-knitting machine, and especially to a large frame, presents peculiar difficulties, owing to the exactitude of the alinement which must always be maintained between the revolving parts and the fixed parts which perform the knitting operation. If quick-acting brake-pressure is applied to a shaft other than that which carries the revolving cylinder, an undue strain is put upon the gearing by which the two are connected, while if an ordinary brake-shoe is applied to the revolving cylinder itself or any part of its axis the lateral pressure disturbs the alinement. By my invention whenever the stop-motion is operated I apply to the cylinder-axis a powerful and quick-acting frictional pressure, which is so balanced as to avoid lateral pressure or disturbance of the alinement.

In the accompanying drawings I have illustrated a knitting-frame of an ordinary type furnished with a stop-motion of a common variety adapted to be thrown by hand when the machine is to be stopped. In many knitting-machines mechanism is provided whereby upon the breaking of a thread or other similar accident the stop-motion is automatically thrown. My invention is obviously equally applicable to machines of this character; but as the automatic stop-motion forms no part of my present invention I have not illustrated it. Likewise it will be understood that my invention is entirely independent of the particular type of knitting-machine which is shown.

Figure 1 is a vertical central section of a knitting-machine having my automatic brake applied to the stop-motion thereof. Fig. 2 is a horizontal section of the same through the line 2 2, Fig. 1. Fig. 3 is a detail showing the relation between the wedge p^2 and the ends of the paired levers t^2 t^2.

A is a table or frame upon which the knitting-machine is mounted. It carries in appropriate journals depending from it the main shaft *a*.

B is an annular plate supported above the table A by means of the uprights *b b b b*. In the center of the table rises the upright post *c*, around which the knitting-cylinder C revolves, being held in place thereon by the plate or disk D. On the lower end of the knitting-cylinder is formed a horizontal bevel-gear *c'*.

E is a vertical bevel-gear meshing with the gear *c'* and splined upon the main shaft. It has formed integrally with it a grooved collar *e*. Within the groove fits a block *f*, pivoted to the stop-lever F. This latter lever is pivoted to the table A at *f'* and by its motion when it is thrown by hand from left to right disengages wheel E from wheel *c'*, thereupon releasing the driving power of the main shaft from the knitting-cylinder, so that the machine may come to a rest.

Thus far I have described only the parts common to an ordinary knitting-machine.

L' L^2 are projecting horizontal cross-bars affixed to the table A near its rear, to which are pivoted, one at either side of the table,

the horizontal levers M′ M². These levers are united at their forward and movable ends by the cross-bar N, which is attached and pivoted to the stop-lever F. In this way the throwing of the stop-lever imparts a corresponding motion to the levers M′ M². P′ P² are projecting cross-bars fixed to the annular plate B at either side of the median line of the machine. Upon each of these is pivoted a depending lever p' p^2, the lower ends of which are attached, respectively, to the horizontal levers M′ M². Upon each of these levers p' p^2 is formed a wedge-shaped section having the narrow edge pointing in the direction in which the stop-lever F must be thrown to disengage the driving power of the machine.

Two friction-disks c^2 c^3 are formed upon the axis of the cylinder above the bevel-gear c', and around each of these disks are wrapped friction-bands r' r^2, each of which nearly encircles one of the disks and with the ends turning out radially therefrom. The ends of the two friction-bands are directed in opposite directions.

s^2 is a bracket mounted on the table A, upon which is pivoted a pair of opposing levers t^2 t^2, between the inwardly-projecting ends of which the ends of the friction-band r^2 are inserted. The other ends of these two levers meet on opposite sides of the wedge-shaped section of the lever p^2 directly in front of the edge of the wedge.

To the bracket s' is pivoted a pair of opposing levers t' t', between the inwardly-projecting ends of which the ends of the friction-band r' are inserted, while their outer ends meet immediately in advance of the wedge-shaped section p'.

By means of the connections thus described the motion of the stop-lever F forces the levers p' p^2 to separate the ends of the paired levers t' t' and t^2 t^2, thereupon immediately applying a corresponding pressure to the friction-bands r' and r^2. The pressure thus applied is sufficient to instantly bring to rest the knitting-cylinder. For the more accurate adjustment of the amount of friction thus applied the inner ends of the paired levers t' t' t^2 t^2 are furnished with adjusting-screws v' v' v^2 v^2 where they touch the loose ends of the friction-bands.

I have described the preferred form of my invention; but it is evident that variations of form may be made without departing from the spirit of my invention.

Having thus described my invention, I claim—

1. In a circular-knitting machine, the combination of a friction-disk upon the axis of the revolving cylinder; a friction-band nearly surrounding the friction-disk; a pair of opposing levers, between the inner ends of which the extremities of the friction-band are inserted; a stop-lever whereby the power is disconnected from the revolving cylinder; and connections whereby the stop-lever, when it disconnects the power, separates the outer ends of the opposing levers whereby frictional pressure is simultaneously applied to nearly all sides of the friction-disk, substantially as described.

2. In a circular-knitting machine, the combination of a friction-disk upon the axis of the revolving cylinder; a friction-band nearly surrounding the friction-disk; a pair of opposing levers, between the inner ends of which the extremities of the friction-band are inserted; a wedge-shaped lever inserted between the outer ends of the opposing levers; a stop-lever whereby the power is disconnected from the revolving cylinder; and connections whereby the stop-lever advances the wedge-shaped lever so as to separate the outer ends of the opposing levers, whereby the frictional pressure is simultaneously applied to nearly all sides of the friction-disk, substantially as described.

3. In a circular-knitting machine, the combination of a pair of friction-disks formed upon the axis of the revolving cylinder; friction-bands nearly surrounding each of the friction-disks and terminating at opposite sides of the machine; mechanisms for compressing together the ends of the friction-bands around the friction-disks, whereby frictional pressure is simultaneously applied to all sides of the axis of the cylinder; a stop-lever whereby the power is disconnected from the revolving cylinder; and connections whereby the stop-lever simultaneously operates the mechanisms for compressing together the ends of the friction-bands, substantially as described.

DAVID HASTINGS HILL.

Witnesses:

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E. REESE.