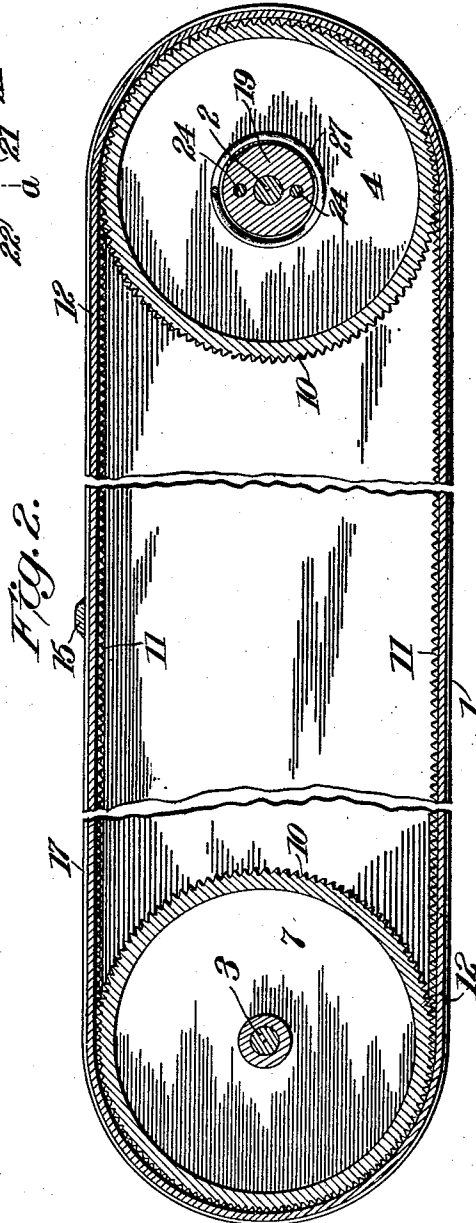
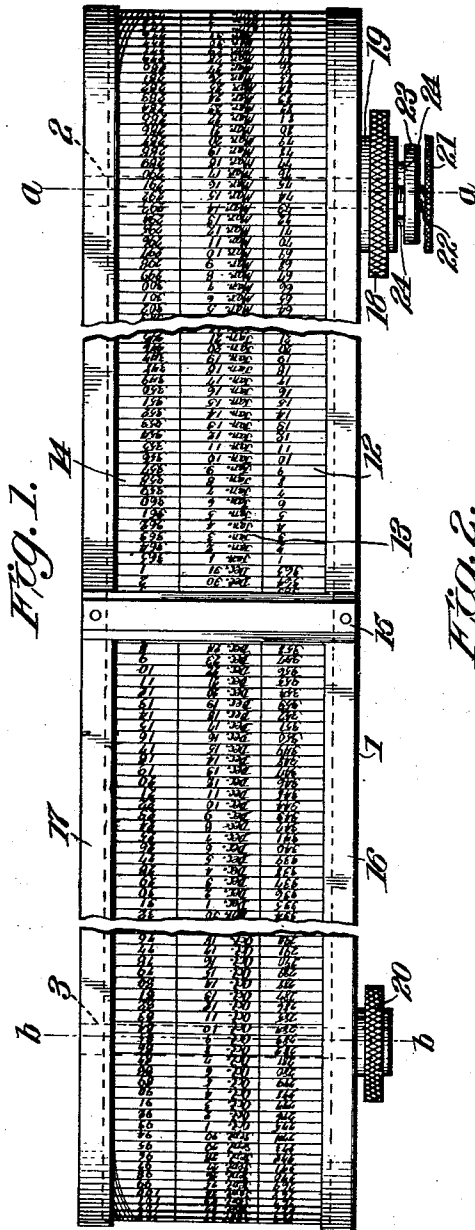


H. K. JONES.
TIME CALCULATING MACHINE.
APPLICATION FILED MAR. 4, 1910.

995,466.

Patented June 20, 1911.

2 SHEETS—SHEET 1.



WITNESSES
Wm. E. Jones Jr.
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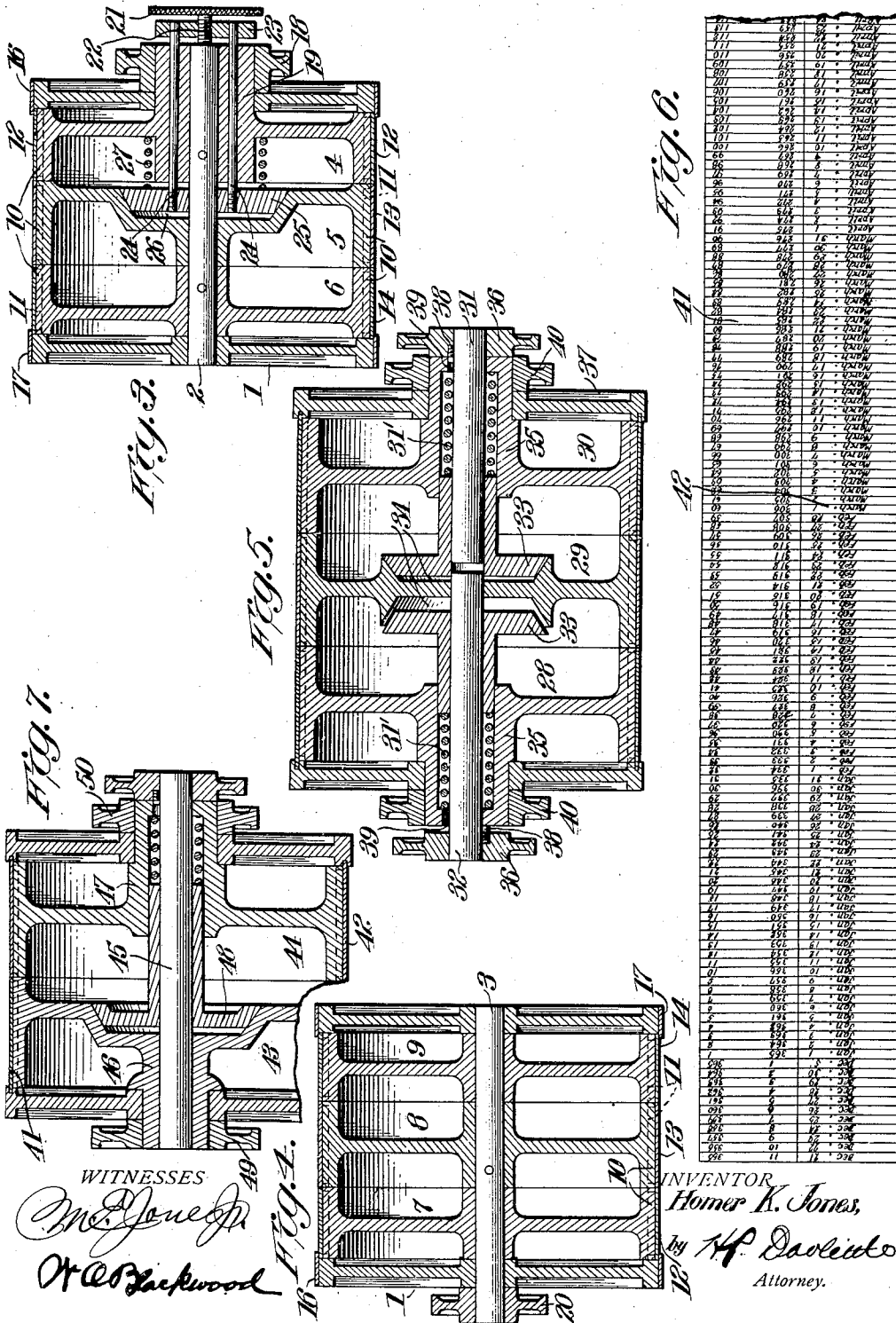
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UNITED STATES PATENT OFFICE.

HOMER K. JONES, OF MEMPHIS, TENNESSEE.

TIME-CALCULATING MACHINE.

995,466.

Specification of Letters Patent. Patented June 20, 1911.

Application filed March 4, 1910. Serial No. 547,309.

To all whom it may concern:

Be it known that I, HOMER K. JONES, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Time-Calculating Machines, of which the following is a specification.

My invention relates to machines for calculating time and it is particularly useful in ascertaining the number of days between given dates and the date upon which a certain period of time will expire and in finding a date for a certain period of time anterior to a given date; such calculations being principally necessary in connection with commercial paper and business accounts.

The invention is embodied in preferable form in the device shown in the accompanying drawings.

In these drawings, Figure 1 is a plan view; Fig. 2, a longitudinal section; Fig. 3, a cross-section on line *a-a* of Fig. 1; Fig. 4, a cross-section on line *b-b* of Fig. 1; Fig. 5 a cross-section corresponding to Fig. 3 but taken through a modified form; Fig. 6, a plan view of the bands for a modified form of machine and Fig. 7 is a sectional view of the wheel and shaft operating means for the bands of Fig. 6.

Referring to the drawings and particularly to Figs. 1 to 4, inclusive, 1 is the frame and 2 and 3 are shafts mounted therein at opposite ends of the machine. On the shaft 2 are rigidly mounted the wheels 4 and 6 and loosely mounted the wheel 5. Wheels 7 and 9 are loosely mounted on shaft 3 and a wheel 8 is rigidly mounted thereon. The wheels 4, 5 and 6 are respectively arranged in alinement with the wheels 7, 8 and 9, and each wheel is provided with teeth 10 adapted to mesh with teeth 11 carried by bands or ribbons 12, 13 and 14, preferably of thin flexible metal, adapted to pass over the wheels. The bands 12 bear the numerals in order from "1" to "365" corresponding to the number of days in a year which are readable from left to right. The band 14 bears the same numerals running from "365" to "1" and readable from right to left and the band 13, preferably arranged between the bands 12 and 14, bears indications of each calendar day of the year. An indicator 15 is mounted upon the frame of the machine directly above the bands. Guide rails 16 and 17 are arranged on the

sides of the machine to prevent lateral movement of the bands.

A knurled knob 18 is secured on the hub 19 of wheel 4. By reason of the rigid connection of wheels 4 and 6 to shaft 2 and the loose mounting of wheels 7 and 9 upon shaft 3, the bands 12 and 14 can be freely moved to the right or left according to the direction in which the knob 18 is turned.

The band 13 may be moved independently of the other bands and either to the right or left by knurled knob 20 on the end of the shaft 3, by reason of the rigid connection of the wheel 8 to the shaft 3 and the loose mounting of the wheel 5 on the shaft 2.

Positive engaging means being provided between the bands and wheels, the bands while not traveling will be free from danger of slipping longitudinally.

To provide for locking the wheels carrying the central band to the wheels of the other bands, a knob 21 is provided with a screw 22 which engages and extends through a disk 23 connected to rods 24 extending through and slidably mounted in the hub 19 of wheel 4 and such rods are connected beyond the end of the hub adjacent wheel 5 to a disk 25 adapted to frictionally engage and be seated in beveled flanges or a dished portion 26 in wheel 5. The disk 23 and walls of the seat are normally disengaged and are held in such position by the abutment of the end of the screw 22 of the knob 21 against the adjacent end of the shaft 2. When it is desired to lock the three wheels together so as to move all the bands in unison, the knob 21 is turned in a direction to allow the spiral spring 27 to force the disk 23 inwardly and into frictional engagement with its seat, whereupon, upon turning the knob 18 the bands will move together and in the same direction. To disengage the wheel 5 from the wheels 4 and 6 the knob 21 is turned in a direction that will cause the abutment of the screw 22 against the shaft 2 to force the disk 23 away from its seat.

The operation of the machine is as follows:—To find the number of days between two given dates the knobs 18 and 20 are turned so as to bring the first given day on the band 13 and the numeral "1" on the band 12 in registry opposite the indicator, whereupon the knob 21 is turned to lock the wheels

together by the friction disk, so that the bands will travel in unison upon turning the knob 18. Such knob 18 is then turned toward the left until the later given day is
 5 opposite the indicator 15. The desired number of days will appear on the band 12 opposite the date on the band 13 and thus indicate the number of days between the two dates. For example, to find the number of days between January 3rd and March
 10 15th, the bands are moved toward the left until "Jan. 3" on band 13 and the numeral "1" on band 12 register, the knob 18 is then turned until "Mar. 15" on band 13 is opposite the indicator 15. The number of days
 15 will appear on band 12 opposite "Mar. 15."

When finding the date a certain number of days from a given date, the bands 13 and 14 are operated to bring the given day
 20 on the band 13 and the numeral "1" on the band 14 in registry opposite the indicator, whereupon the knob 21 is operated to lock the wheels together by the friction disk, so that upon turning the knob 18 the bands will
 25 travel in unison. The knob 18 is then turned toward the right until the numeral on band 14 corresponding to the number of days passes under the indicator 15. The desired date will appear opposite the numeral on the band 14 corresponding to the
 30 number of days desired from the given date.

In finding the date a certain number of days anterior to a given date, the bands 12 and 13 are in unlocked position. The numeral on band 12 corresponding to the number of days anterior to the given date is brought to register with the given date. The band 12 is then moved by knob 18 to the left until the numeral "1" thereon appears
 40 at the indicator. The anterior date will be found on band 12 opposite the numeral 1.

In Fig. 5 a modified means for operating the bands is shown. The wheels 28, 29, 30, respectively correspond to the wheels 4, 5, and 6. The shafts 31 and 32 are each provided with a rigidly secured disk 33 adapted to frictionally engage seats 34 in the wheel 29. The shafts are mounted loosely within the hubs 35 of the outer wheels and each
 50 shaft is provided with a knurled knob 36 exterior of the frame 37 of the machine. Each knob carries a lug or pin 38 adapted to enter a longitudinal slot or groove 39 in the hubs 35. A portion of the hubs 35 project beyond the sides of the machine and such portions have rigidly secured thereto the knobs 40. Springs 31' surround the shaft and are maintained in cut-away portions in the hubs 35 of the outer wheels between
 60 a wall thereof and the ends of the shanks of the disk. By means of this arrangement two wheels may be locked together from either side of the machine. In this modification one disk is shown as being
 65 seated, thereby locking wheels 29 and 30

and the other disk is shown as unseated whereby wheel 28 can be turned independently of the other wheels. When one of the disks is seated to lock two of the wheels together the pin 38 of the knob 36 of the
 70 shaft upon which the disk is mounted is within the groove 39. To disengage the disk and seat, the knob is pulled outwardly until the pin 38 is drawn from engagement with the groove 39, whence the knob is turned to right or left so that the pin will abut against the outer edge of the adjacent hub. The disk by its rigid mounting on the shaft moves outwardly when the knob is pulled and the pin abuts against the hub and holds
 80 the disk away from its seat a distance equal to the length of the pin. The two bands are then turned by means of the knobs 40. The wheels 28 and 30 when free to be moved independently of the other wheels may be so moved,
 85 respectively, by their knob 40. The three wheels may be locked together if desired by allowing both disks to enter their seats. In computing time the bands are moved in the same manner with respect to each other as
 90 in the other device.

Referring to the device shown in Figs. 6 and 7, I employ two endless bands 41 and 42, the band 41 bearing the columns of the numerals "1" to "365" corresponding to the
 95 number of days in the year, one column reading from left to right and the other column reading from right to left, and the band 42 bears 365 graduations indicating the days of the year.
 100

The bands 41 and 42, respectively, pass over wheels 43 and 44 at one end of the machine and at the other end of the machine they pass over loosely mounted wheels. The wheels (not shown) and bands have inter-
 105 meshing teeth as in the other views. The wheels are loosely mounted upon a shaft 45 arranged to slide a slight distance in the hubs 46 and 47 of the wheels. A disk 48 is fixed on the shaft and is adapted to frictionally engage a seat carried by the wheel 43. The disk is operated in the same manner as are the disks of Fig. 5 and the construction of the parts for operating the same correspond to those of said figure. When
 115 the disk and its seat are out of engagement the wheels 43 and 44 may be respectively turned independently of each other by the knobs 49 and 50 mounted upon their hubs.

In manufacturing the various forms of
 120 my invention a slight space will be left between the adjoining bands to prevent binding.

In some machines, I provide additional wheels and bands therefor, which additional
 125 bands may bear computing graduations of insurance rates or suitable graduations used in connection with the calculating of pay rolls.

It is clear that various changes in the 136

details of construction may be made without departing from the principle of my invention.

Having thus described my invention, what I claim is:—

1. In a time-calculating machine, an endless band movable in either direction and provided with graduations bearing numerals arranged in order and corresponding to the number of days in the year, a second endless band movable in either direction and provided with graduations bearing the days of the year in order, wheels over which said bands pass, a shaft rotatable in either direction at each end of the device, means to lock the wheels on one of said shafts together so that they may be rotated in unison in either direction, said means comprising a member projecting from one of the latter wheels into the interior of the machine and adapted to frictionally engage a portion of the adjacent wheel, said latter wheel loosely mounted on the shaft, a spring exerting pressure against the member and tending to press the member into frictional engagement with the adjacent wheel, an operating knob fixed to the engaging member exterior of the machine, and means to hold the member out of frictional engagement with the adjacent wheel, the other wheel on said latter shaft being fixed thereto and having an independent operating knob situated adjacent the knob for the engaging member, substantially as described.

2. In a time-calculating machine, an endless movable band provided with graduations bearing numerals corresponding to the number of days in the year arranged in order, a second endless movable band provided with graduations bearing the days of the year arranged in order, a wheel at each end of the machine for each band, a shaft at each end of the machine rotatable in either direction, the wheel at one end of the machine for one of the bands secured to the adjacent shaft to rotate therewith and the wheel for the same band at the other end of the machine loosely mounted on the adjacent shaft, the adjacent wheel for another band secured to the last mentioned shaft to rotate therewith and the wheel for the same band at the opposite end of the machine loosely mounted on the shaft at said end, whereby the bands may be moved

independently of each other in either direction, a member carried by one of the wheels and movable longitudinally along one of said shafts interior of the machine adapted to frictionally engage a portion of the other wheel on the same shaft, and an operating knob for the member on the exterior of the machine, whereby the wheels may be locked so as to move the bands in unison upon the turning of one of said shafts, substantially as described.

3. In a time-calculating machine, an endless band provided with graduations bearing numerals corresponding to the number of days in the year, a second endless movable band provided with graduations bearing the days of the year, wheels over which said bands pass, shafts for said wheels, one of said wheels rigidly secured to one of said shafts, a loosely mounted wheel on the same shaft, slidable rods extending through the hub of said rigidly secured wheel and carrying a disk adjacent the loosely mounted wheel, a spring pressing against said disk, a seat for said disk carried by the loosely mounted wheel and means on the exterior of the machine for drawing said disk from its seat, substantially as described.

4. In a time-calculating machine, an endless movable band provided with graduations bearing numerals corresponding to the number of days in the year, a second endless movable band provided with graduations bearing the days of the year, wheels over which said bands pass, shafts for said wheels, one of said wheels rigidly secured to one of said shafts, a loosely mounted wheel on the same shaft, slidable rods extending through the hub of said rigidly secured wheel and carrying a disk adjacent the loosely mounted wheel, a seat for said disk carried by the loosely mounted wheel, a spring pressing said disk toward the seat, a disk exterior of the machine to which the rods are secured, a screw extending through said disk and bearing against the exterior of the machine and an operating head on said screw, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

HOMER K. JONES.

Witnesses:

FREDERICK H. TRACY,
JOHN W. FARLEY.