A. E. RHOADES.

HAND WHEEL MECHANISM FOR LOOMS AND OTHER MACHINES.

APPLICATION FILED OCT. 15, 1920.

1,401,098.

Patented Dec. 20, 1921.

2 SHEETS—SHEET 1.

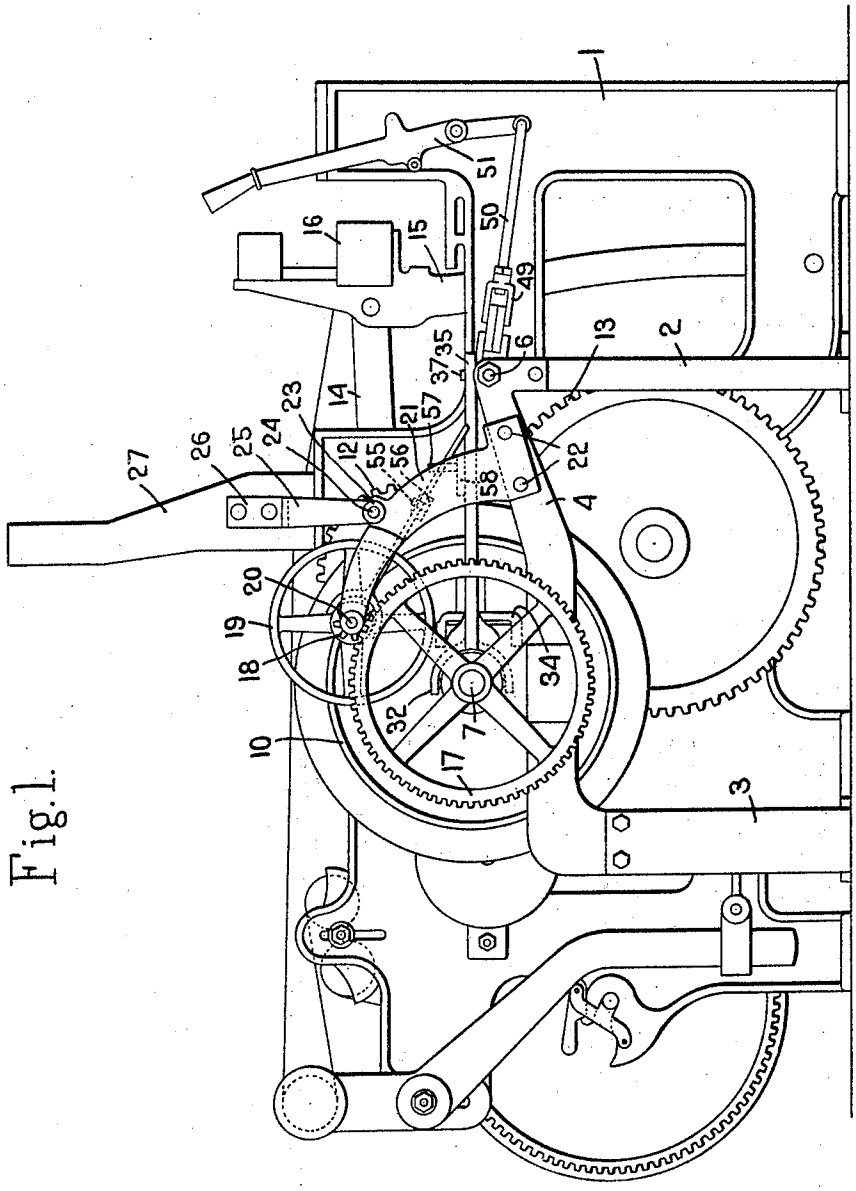


Fig. 1.

Inventor.
Alonzo E. Rhoades
by Heard Smith & Tennant.
Attys.

A. E. RHOADES.

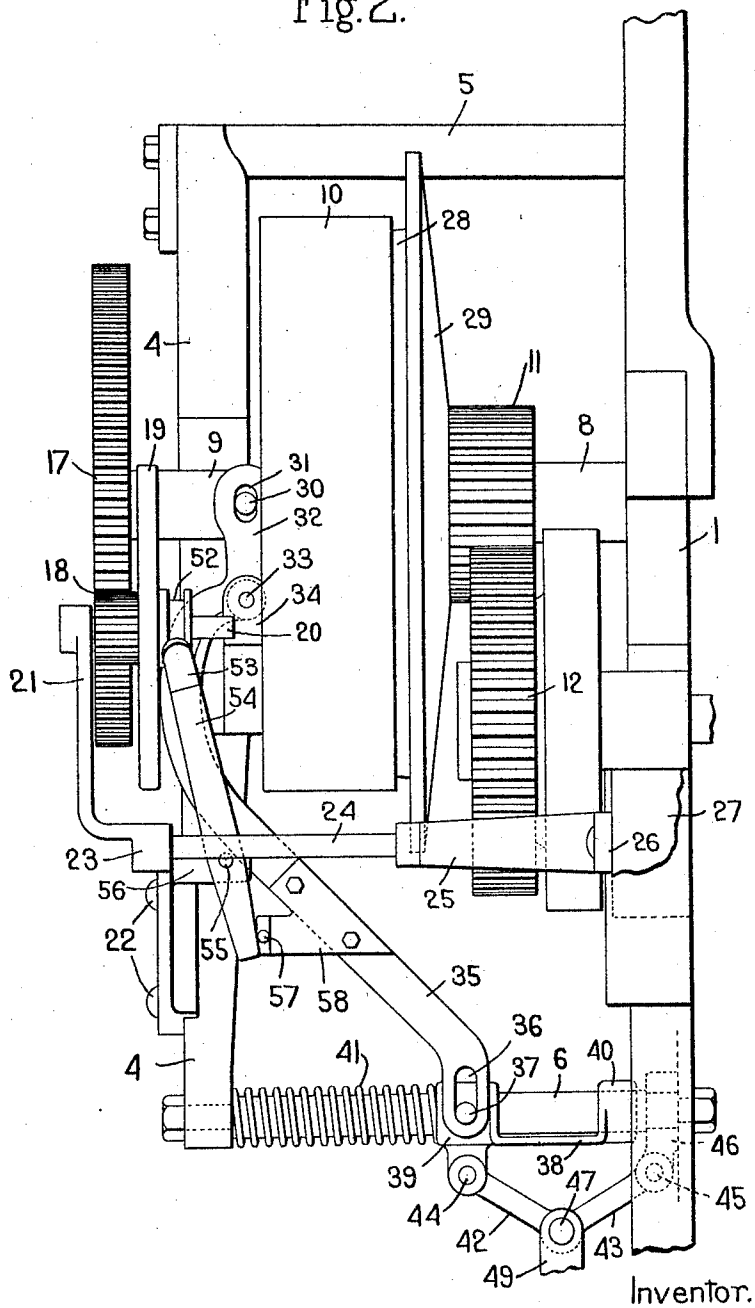
HAND WHEEL MECHANISM FOR LOOMS AND OTHER MACHINES.

APPLICATION FILED OCT. 15, 1920.

1,401,098. Patented Dec. 20, 1921.

2 SHEETS—SHEET 2.

Fig. 2.



Inventor.
Alonzo E. Rhoades
by Heard Smith & Tennant.
Attys.

UNITED STATES PATENT OFFICE.

ALONZO E. RHOADES, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER CORPORATION, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

HAND-WHEEL MECHANISM FOR LOOMS AND OTHER MACHINES.

1,401,098. Specification of Letters Patent. Patented Dec. 20, 1921.

Application filed October 15, 1920. Serial No. 417,188.

To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Hand-Wheel Mechanisms for Looms and other Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to improvements in hand wheel mechanisms for looms and other machinery which is designed for heavy work and in which it is desirable to rotate the driving shaft when the machine is not being power driven.

The object of the invention is to provide a hand wheel mechanism through which mutiplied power may be transmitted from the hand wheel to the driving shaft of the machine and in which the hand wheel mechanism may be rendered inoperative during the actuation of the machine under power.

A further object of the invention is to provide automatically operable means for rendering the hand wheel mechanism inoperative when power is applied to the driving shaft of the machine, said mechanism preferably being so constructed as to free the hand wheel mechanism when the power supplying means is released, so that the hand wheel mechanism may be manually moved into operative position.

The invention is disclosed herein as applied to the driving mechanism of a loom of a usual type, but it will be understood that in its broad aspects the invention is applicable to any machine, particularly of the heavy type, in which it is desirable frequently to rotate the driving shaft when the power supplying means is disconnected therefrom.

In the drawings:

Figure 1 is a side elevation of sufficient portions of a loom to show the application of the invention thereto.

Fig. 2 is a plan view of a sufficient portion of the driving mechanism of a loom to show the manner in which the invention is incorporated therein.

The loom illustrated in the accompanying drawings may be of the usual type comprising side frames 1 which support the usual mechanism of the loom, including bearings for the various shafts thereof. In the present instance a supplemental frame is provided which comprises standards 2 and 3 which may rest at their lower ends upon the floor and at their upper ends support a transverse member or beam 4. This frame is connected to the loom side at one end by a strut or beam 5 and at the other end by a spacing rod 6 having reduced end portions which are rigidly connected respectively to the cross beam 4 and the loom side.

The driving shaft 7 of the loom is journaled in suitable bearings 8 in the loom side and in a bearing 9 which is mounted upon the beam 4 of the supplemental frame. Suitable power supplying means are provided for rotating the driving shaft. As illustrated herein the power supplying means comprises a pulley 10 which is rotatably and slidably mounted upon the driving shaft 7, said pulley being provided with a clutch member adapted to engage a cooperating clutch member which is fixedly secured to the shaft. The coöperating clutch member desirably is formed integral with a pinion 11 which serves to transmit power to a gear 12 which in turn engages a gear 13 upon the cam shaft of the loom. A pitman 14, connected to the cam shaft and to the usual swords 15, actuates the lay 16 in the usual manner.

Other mechanisms of the loom are likewise operated in the usual well known manner and since they do not form part of the present invention are not illustrated herein.

In usual constructions a hand wheel is secured to the end of the driving shaft 7 in order to enable said shaft to be rotated to turn over the loom when the power supplying means is disengaged therefrom. In heavy looms, such as those which are utilized in weaving canvas, duck, and other heavy fabrics, it is often difficult for the operator to turn over the loom. The present invention contemplates the provision of power multiplying means operable by a hand wheel which will enable the loom to be turned over with relatively little effort on the part of the operator. This is accomplished by affixing a relatively large gear 17 to the end of the driving shaft 7, said gear

being engaged by a pinion 18 which preferably is integral with the hub of the hand wheel 19. The hand wheel hub and gear desirably are rotatably and slidably mounted upon a stud shaft 20 which is secured to, or integral with, a bracket 21 which is fixedly secured by suitable bolts 22 to the beam 4 of the supplemental frame. As illustrated herein this bracket 21 is arch-shaped and is offset laterally to extend beyond the outer plane of the supplemental frame. It is provided with a boss 23 having a socket in which is seated one end of a strut 24, the other end of which engages a bracket 25 having a base 26 which is fixedly secured to the arch 27 of the loom.

It is desirable that the hand wheel pinion 18 shall be released from engagement with the gear 17 upon the driving shaft when the loom is being operated by power, and the present invention includes the provision of means for automatically removing the pinion 18 from engagement with the gear 17 when the loom is started and for retaining the same out of engagement therewith during the operation of the loom. Such means, however, desirably releases the hand wheel when the loom is stopped so that the hand wheel may be shifted manually to cause the pinion 18 to engage the gear 17 and thereby enable the loom to be turned over manually.

The power supplying mechanism may be releasably connected to the driving shaft in any suitable manner, as for example, by means of a frictional clutch. In the present invention power is supplied from any suitable generator through the pulley 10 which is rotatably and slidably mounted on the driving shaft 7, the pulley 10 being provided with one of a pair of coöperating clutch members, such as an internal hollow cone which is adapted to coöperate with a complementary clutch member or cone 28 formed integral with, or secured to, a base 29 which is secured to, or formed integral with, the pinion 11 which, as above described, is fixedly secured to the driving shaft 7.

Any suitable means may be provided for shifting the clutch. As disclosed herein the combined pulley and clutch is rotatably journaled upon a sleeve which is slidably mounted on the shaft 7, the sleeve being provided with studs 30 which engage slots 31, or the forked end of one arm 32 of a lever which is pivotally mounted upon a shaft 33 carried by a stand 34 which is mounted upon the beam 4 of the supplemental frame. The other arm 35 of the clutch shifting lever, which, as illustrated herein, is offset to avoid contact with the other mechanisms, is of considerably greater length than the arm 32 and is so constructed as to be operated from the clutch shifting or knock-off lever of the loom.

In the present construction the lever arm 35 is provided near its end with a slot 36 which engages a pin 37 carried by a skeletonized frame 38 having sleeves 39 and 40 which are slidably mounted upon the spacing rod 6. A helical spring 41, which encircles the spacing rod 6 and abuts at one end against the sleeve 39 and at the other end against the beam 4, tends normally to force the arm 35 of the clutch shifting lever in a direction to remove the slidable member of the clutch from engagement with its coöperating member.

The frame 38 may be actuated to force the slidable clutch member into engagement with its coöperating member in any suitable manner. In the preferred embodiment illustrated herein it is actuated through a toggle mechanism comprising toggle arms 42 and 43, the toggle arm 42 being pivotally connected to a stud 44 upon a boss on the collar 39, and the arm 43 pivotally connected to a stud 45 carried by a bracket 46 which is secured to the loom side, preferably being mounted upon a reduced portion of the spacing rod 6 and clamped thereby against said loom side. The pivotal pin 47, which unites the toggle arms 42 and 43, is carried by a yoke 49 which is adjustably mounted upon one end of a rod or link 50, the other end of which is pivotally connected to the knock-off lever or shipper 51.

The knock-off shipper or lever, which is illustrated herein, is of the type known as the "easy shipper" and is provided with suitable connections to the controlling mechanism of the loom so that the lever may be automatically operated through the usual stop mechanisms under abnormal conditions effecting the operation of the loom, to cause a stoppage of the loom.

When the loom is to be started the knock-off lever or shipper 51 is moved from the rest position, shown in Fig. 1, to the usual operating position, by pulling the handle to the right. This forces the link 50 to the left causing the toggle arms 42 and 43 to spread, thereby forcing the frame 38 and collar 39 against the spring 41 and at the same time moving the arm 35 of the clutch shifting lever in a direction to cause the arm 32 to force the slidable clutch member into engagement with its coöperating member.

In order to automatically release the hand wheel mechanism from operative relation to the driving shaft at the time the loom is started, and to maintain the same out of operative relation during the operation of the loom, means are provided which are controlled by the clutch shifting means to slide the hand wheel and its pinion longitudinally of the stud shaft 20. In the preferred construction illustrated herein the hub of the hand wheel is provided with an annular groove 52 which is engaged by pins in the forked end 53 of a hand wheel shifting lever

54 which is fulcrumed upon a stud 55 carried by a flange or boss 56 projecting laterally from the bracket 21. The opposite end of the lever 54 is engaged by a member or stud 57 projecting upwardly from the plate 58 which is fixedly secured to the arm 35 of the clutch shifting lever.

By reason of the construction above described the movement of the arm 35 of the clutch shifting lever to force the clutch members into engagement causes the stud 57 to swing the hand wheel shifting lever about its fulcrum and thereby to slide the hand wheel and its pinion longitudinally of the shaft 20 until the pinion 18 is disengaged from the gear 17 on the driving shaft and to retain the pinion 18 out of engagement with said gear during the operation of the loom.

When the clutch is released by the knock-off mechanism, or otherwise, the arm 35 of the clutch shifting lever is moved by the spring 41 in the opposite direction, thereby releasing the stud 57 from its engagement with the hand wheel shifting lever 54 so that the hand wheel may be moved manually longitudinally of the stud shaft 20 to place the pinion 18 into engagement with the gear 17, so that the hand wheel may then be operated to turn over the loom.

It will be understood that the embodiment of the invention disclosed herein, as applied to hand wheel mechanisms for looms, is illustrative of one of the various applications of my invention, but is not restrictive, and that the invention may be embodied in any other type of machine in which it may be found desirable and useful. It will also be understood that other means for rendering the hand wheel mechanism inoperative during the operation of the machine may be employed within the spirit and scope of the invention and that the particular mechanism disclosed herein comprises merely one of the preferred embodiments of my invention.

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

1. In a machine having a driving shaft, power supplying means, a clutch for transmitting power therefrom to said driving shaft having means normally tending to disengage said clutch and means for shifting said clutch into operative position, a hand wheel, means operable by said hand wheel for rotating said driving shaft and means operable by the shifting of said clutch to operative position to render and maintain said hand wheel inoperative during the actuation of the driving shaft by the power supplying means.

2. In a machine having a driving shaft, power supplying means, a clutch for transmitting power therefrom to said driving shaft and means for actuating said clutch, a gear on said driving shaft, a hand wheel having a pinion adapted to mesh with said gear, and automatically operable means for removing said hand wheel pinion from engagement with said gear during the actuation of said driving shaft by said power supplying means.

3. In a machine having a driving shaft, power supplying means, a clutch for transmitting power therefrom to said driving shaft, clutch shifting means, a gear upon said driving shaft, a hand wheel shaft, a hand wheel slidably mounted thereon having a pinion adapted to engage said gear, and means operable by said clutch shifting means, when the clutch is moved to operative position, to slide said hand wheel pinion longitudinally of said shaft and out of engagement with said gear whereby the hand wheel mechanism is rendered inoperative during the actuation of the driving shaft by the power supplying means.

4. In a machine having a driving shaft, a priving pulley rotatably mounted thereon, coöperating clutch members on said pulley and said shaft, a clutch shifting lever, a gear upon the driving shaft, a hand wheel shaft, a hand wheel rotatably and slidably mounted thereon having a pinion adapted to engage said gear, a hand wheel shifting lever and means for actuating the same from said clutch shifting lever to disengage said hand wheel pinion from said gear, when the clutch shifting lever is actuated to cause engagement of said clutch members.

5. In a machine having a driving shaft, power supplying means, a clutch for transmitting power therefrom to said driving shaft, a clutch shifting lever, a gear upon said driving shaft, a hand wheel shaft, a hand wheel rotatably and slidably mounted thereon having a pinion adapted to engage said gear, a hand wheel shifting lever, means for actuating the same from said clutch shifting lever to cause the hand wheel pinion to slide longitudinally of said shaft when the clutch is thrown into operative position and to free said hand wheel shifting lever when the clutch is released, whereby the hand wheel may be moved manually to operative position.

In testimony whereof I have signed my name to this specification.

ALONZO E. RHOADES.