(No Model.) 3 Sheets—Sheet 1.

# J. A. SMITH & V. B. GIDDINGS.

## RAILWAY TIME SIGNAL.

No. 417,749. Patented Dec. 24, 1889.

Fig. 1.

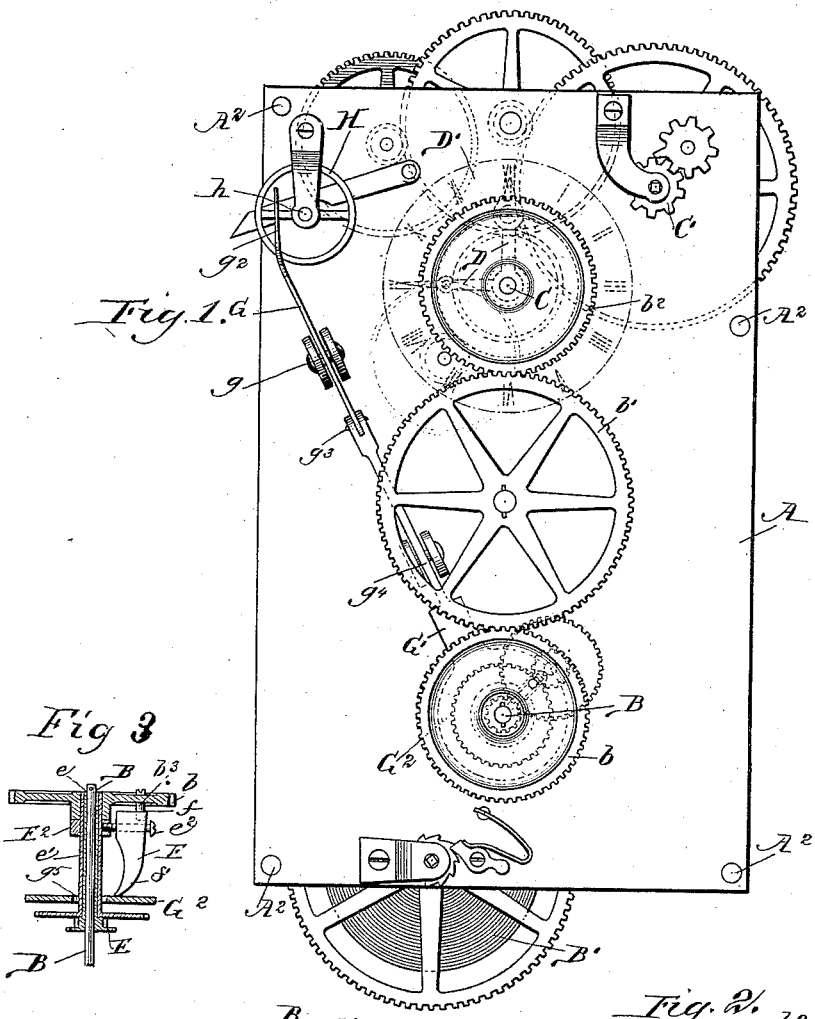
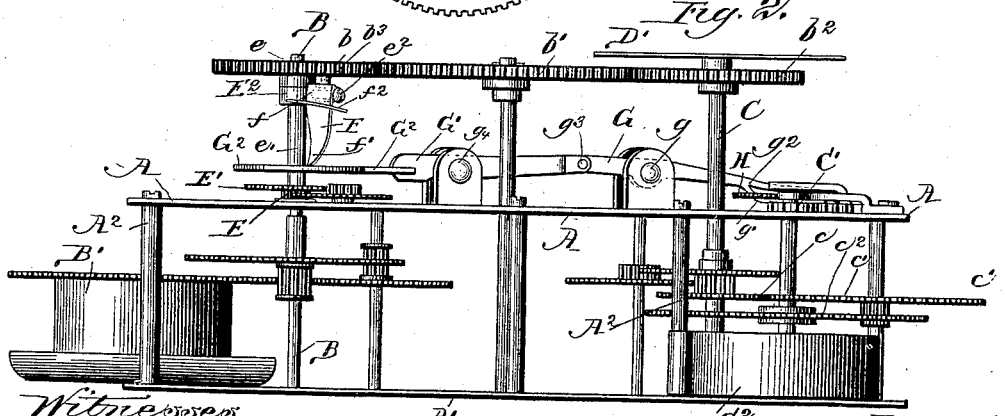



Fig 3




Fig. 2.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 4.

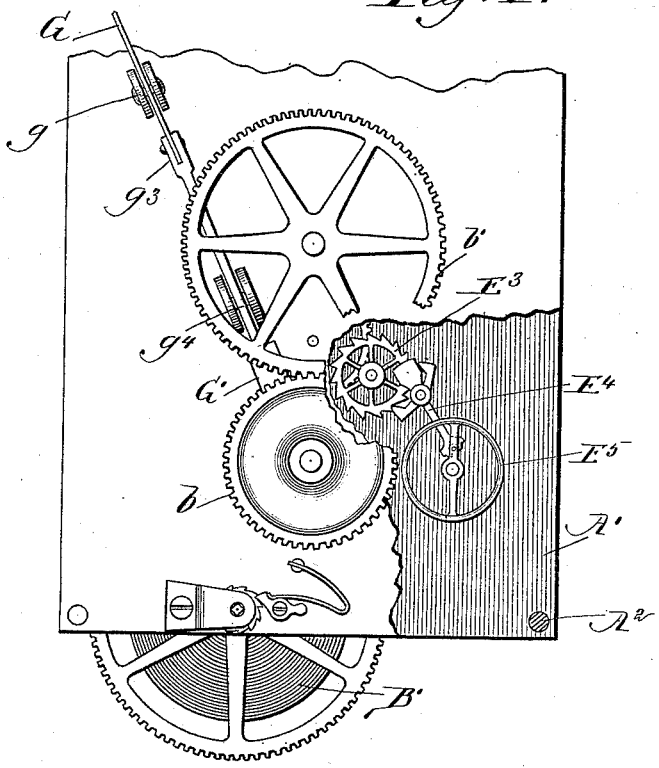
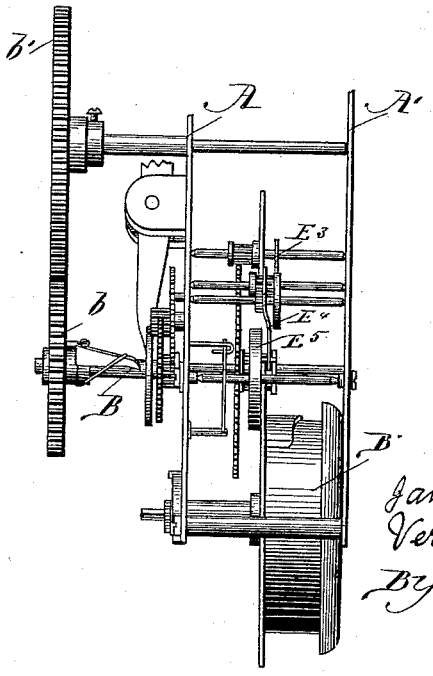



Fig. 5.

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## RAILWAY TIME SIGNAL.

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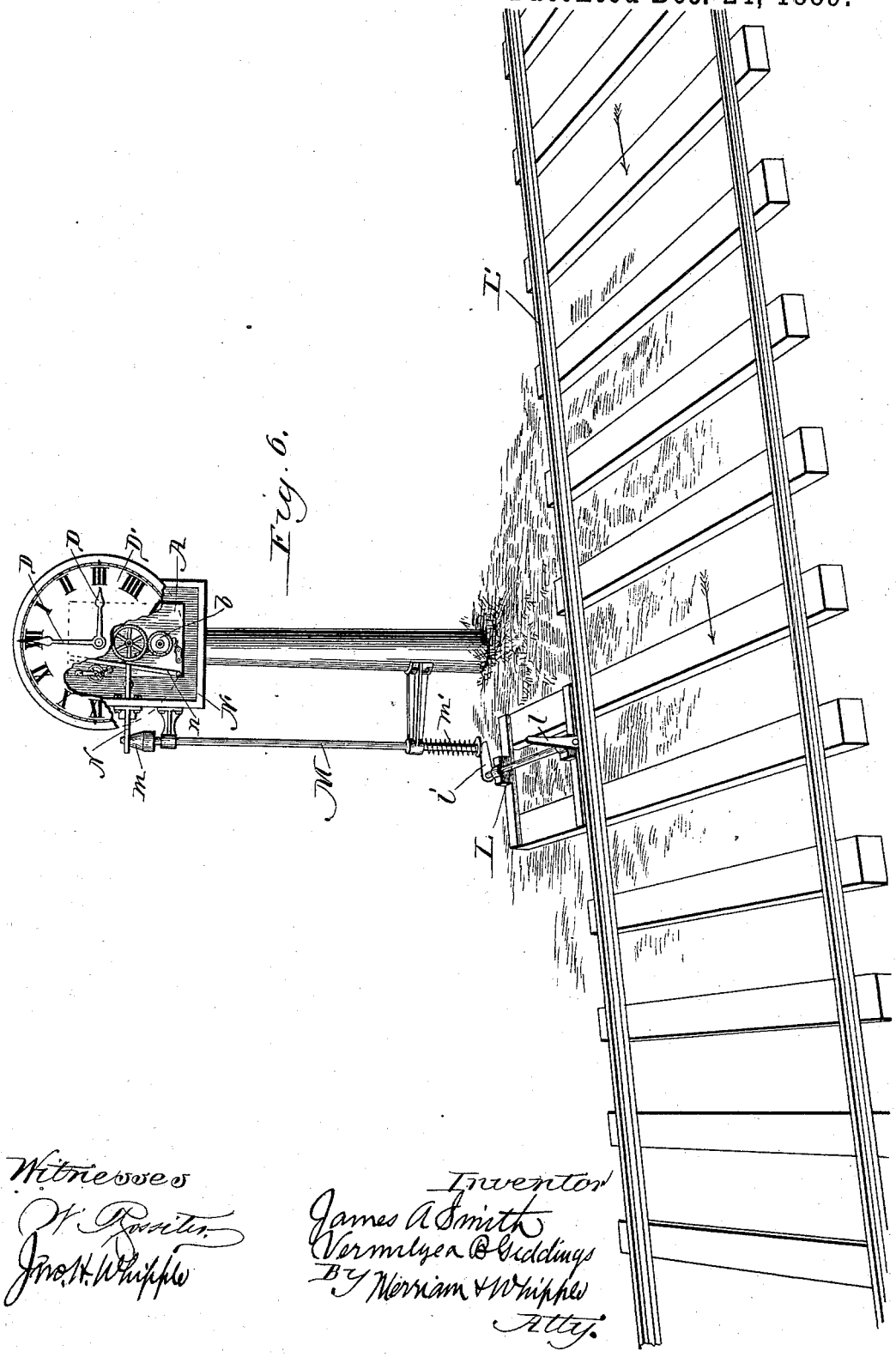

Fig. 6.

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# UNITED STATES PATENT OFFICE.

JAMES A. SMITH AND VERMILYEA B. GIDDINGS, OF CHICAGO, ILLINOIS.

## RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 417,749, dated December 24, 1889.

Application filed May 10, 1889. Serial No. 310,234. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES A. SMITH and VERMILYEA B. GIDDINGS, of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Automatic Time-Registers, of which the following is a specification.

Our invention relates to time-registers for railroads; and the object of our improvements is to adapt ordinary clock mechanism to be used for indicating the time of the passage of trains of cars over the road at any place where the register may be located. This object we have attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan or top view of an apparatus embodying our invention. Fig. 2 is a side or edge view of said apparatus, such as would be seen in looking at the edge thereof from the left and at right angles to the face of the plan, as shown in Fig. 1. Fig. 3 is a vertical section of a detail showing the shafts of clock-hands and the manner of connecting a tripping mechanism with the hour-hand shaft. Fig. 4 is a fragmentary plan view with a portion of the top plate broken away to show the clock-escapement. Fig. 5 is a side view of Fig. 4 looked at from the right side, and shows the clock-work of the normally-running part of the apparatus more fully than it is shown in Fig. 2. Fig. 6 is a perspective view showing the apparatus with a full dial partly broken away and mechanism for connecting the apparatus with the railway.

Our invention consists in two independent clock or time-keeping mechanisms, one of said mechanisms having the ordinary escapement and being adapted to run normally, as in keeping time, independently of the other, and said other mechanism being without such escapement, but held normally at rest by a trip-lever, which is adapted to be thrown in one direction by exterior means for releasing said normally-static mechanism at irregular intervals and allowing the same to run rapidly and overtake said other or normally-running mechanism and to be reversed automatically by said last-named mechanism as soon as overtaken for again checking said normally-static mechanism.

The invention also consists in such further subordinate combinations or features as are hereinafter described, and pointed out in the claims.

In the drawings, A designates the front or top plate of the frame for supporting the train of mechanism, and A′ the bottom plate. These plates are connected at the corners and elsewhere by posts $A^2$ in the ordinary way, the said plates being about double the length required for a single clock mechanism alone.

B is the spindle for the hand-shafts of the normally-running mechanism, the hands being omitted. This spindle is connected to the plates A A′, and between said plates carries the ordinary clock mechanism, operated by a spring B′, which mechanism is not more fully described for the reason that only ordinary clock mechanism is used, and further description is not deemed necessary to a full understanding of our invention. Above the plate A said spindle B carries the minute-hand wheel E, with the sleeve *e*, ordinarily employed to carry the minute-hand, and the hour-hand wheel E′, with the outer sleeve *e*′, ordinarily employed for carrying the hour-hand. This normally-running part of the apparatus is provided with the usual lever-escapement shown in Fig. 4, and consisting of an escapement-wheel $E^3$, lever $E^4$, and balance $E^5$, all of the ordinary construction and arrangement, and it runs the same as an ordinary clock in keeping time, with the exception that it does not register the time, and hence the dial and hands are omitted as not a part of this portion of the apparatus.

C is the spindle or shaft of the normally-static mechanism. This spindle is also connected to the plates A A′, the same as the spindle B, and between said plates carries similar mechanism, being connected by gearing $c\ c'\ c^2$ with a shaft C′, journaled in said plates and operated by a spring $C^2$, which may be wound up in the ordinary manner by means of a key applied to the upper end of said shaft C′. Said spindle C above the plate A has the minute-hand wheel and sleeve and the hour-hand wheel and sleeve the same as the spindle B; but the same are not illustrated in this connection, the illustration of Fig. 3 being applicable thereto, as well as to

spindle B. The sleeve of the minute-hand wheel and the sleeve of the hour-hand wheel of said spindle C are respectively provided with hands D, and a dial D′ is placed around the same, either as shown in dotted lines, as shown in Fig. 1, or a full dial, to be extended over both parts of the apparatus, as shown in Fig. 6, being in all respects the same as those of an ordinary clock. Said spindles B and C are connected by a train of gears $b$ $b'$ $b^2$, said gear $b$ being journaled or placed loosely on the hour-hand sleeve $e'$ of the spindle B, and said gear $b^2$ being fixed rigidly to the corresponding sleeve of said spindle C. This connection permits the mechanism connected with said spindle B to run, as in keeping time, entirely independent of that connected with said spindle C. Immediately below the gear $b$ there is a collar $E^2$, fixed to said sleeve $e'$ by a set-screw $e^2$, so as to turn with said sleeve under the control of the normally-running mechanism. To the shaft of said set-screw there is pivoted a scroll-shaped cam F, the end or portion $f$ of which above the screw being curved or inclined in one direction and the end or portion $f'$ of which below the screw being curved or inclined in the opposite direction. Said curved end $f'$ is so placed as to point or incline backward relatively to the direction of motion of said sleeve and to swing out of the way of and pass any object with which it may be brought in contact as it is carried around by the rotation of said sleeve, the pivotal connection with the screw allowing it to move freely thereon. There is a light spring $f^2$ attached to the collar $E^2$ and adapted to hold the end $f'$ of said scroll-shaped cam down or throw it back to normal position in case it should be pushed out of place. Said gear $b$ has a lug or pin $b^3$, adapted to engage the upper end $f$ of said scroll-shaped cam for operating said cam, as presently described. Said normally-static mechanism is held in check by a trip-lever G, which is pivoted to a lug $g$, attached to the plate A, and has an arm or projection $g'$ at $g^2$, which engages with a fly-wheel H, whose shaft $h$ is connected by gearing with the train of said mechanism. The opposite end of said lever is jointed to a supplemental lever G′ by a flexible joint at $g^3$, and said lever G′ is also pivoted to a lug on plate A at $g^4$, and the opposite end thereof has a plate or disk $G^2$ connected rigidly therewith. Said disk has an opening $g^5$ in the center to allow said disk to be placed over the sleeve $e'$ and play up and down under said scroll-shaped cam as said lever $G^2$ is vibrated. By pressing the joint at $g^3$ down or toward the plate A by any exterior means or force the arm or projection $g'$ will be thereby lifted out of contact with the fly-wheel H and the disk $G^2$ be raised; the scroll-shaped cam swinging out of the way to permit such movement. The normally-running mechanism carries the scroll-shaped cam around with the hour-hand sleeve, the lower end of said cam dragging on said disk and moving away from the position of the pin $b^3$ of the gear $b$, which remains at rest; but when said lever G is tripped or disengaged from the fly-wheel, as above described, the normally-static mechanism is thereby released and immediately starts and continues moving forward rapidly under the force of spring $C^2$ until the gear $b$ overtakes the scroll-shaped cam, and the pin $b^3$, striking the upper end $f$ thereof, throws the lower end $f'$ down on the disk $G^2$ and forces it down to normal again. This movement reverses the position of lever G and causes its arm or projection $g'$ to again engage the fly-wheel and bring its connected mechanism to its normal state of rest. The gearing which connects the spindles B and C and the relation of the scroll-shaped cam thereto are such as to permit the mechanism connected with spindle C to move when released only through the distance previously traveled by the mechanism connected with spindle B; hence when said two mechanisms are set or timed together and the one connected with spindle B is started in operation the other one, remaining at rest, will, when tripped or released after the lapse of any interval, start and run rapidly until it overtakes the former and be then stopped automatically, the hands D passing almost instantly from the starting-point and being brought to rest at the time of the tripping as measured, but not registered, by the first-mentioned mechanism, which is the same as that indicated by said hands on the dial D′. If the sleeve $e'$ should make more than a complete revolution while the pin $b^3$ is at rest, that side of the upper end $f$ of said scroll-shaped cam which inclines away from said pin will strike said pin and throw the opposite end up, so as to allow said cam to pass said pin without affecting the other mechanism, and fall into normal position on the other side, so that said pin will have to make the same revolution that said cam has made before it will come into position to trip said cam and reverse the jointed levers G′ G in the manner described.

A bell-crank lever or other equivalent vibrating arm may be applied as the exterior means to move the joint $g^3$ in the proper direction to release the fly-wheel, and it is intended to apply such bell-crank lever or arm held normally out of connection with said joint by a spring or weight, and to connect the same with the road by a rod or wire arranged to be struck by the passing trains, and thereby be moved or turned so as to operate said bell-crank lever or arm and cause the same to strike and throw said joint in, so as to release said fly-wheel, said bell-crank lever then returning to normal and leaving the way free, so that said scroll-shaped cam when operated upon by said pin $b^3$ can reverse said joint, as before described.

In Fig. 6 of the drawings, L designates a rocking spring-pressed rod provided with an

arm $l$ at one end held normally upright and adapted to be struck by a projection on the locomotive of a train passing on the track L′ and turned so as to throw upward an arm $l'$, projecting from said rod L at a different angle, and adapted to raise a rod M, resting on said last-named arm and having a beveled point $m$ at the top, which comes in contact with a lever N, pivoted to the frame or casing N′ of the apparatus in such manner that when said rod M is raised the inner end of said lever will be thrown inward against a spring $n$ and will bear the same down upon or against the joint $g^3$, which connects the levers G and G′ for releasing said fly-wheel. The rod M falls back or is returned by a spring $m'$ as soon as the locomotive passes, and the spring $n$ is thereby released and returns to normal, leaving said joint $g^3$ free to be reversed at the proper time.

What is claimed is—

1. An apparatus for registering time, consisting of the following elements in combination, namely: first, an ordinary clock mechanism having the usual escapement for keeping regular time and adapted to be normally in operation; second, an ordinary clock mechanism having a fly-wheel and trip-lever instead of the usual escapement for holding said mechanism normally at rest, and also having the ordinary dial and hour and minute hands; third, a supplemental lever jointed to said trip-lever and having a disk or plate which is continuously in connection with a pivoted cam carried round by the hour-hand shaft of said first-named mechanism, and, fourth, a train of gears connecting said first and second above-named mechanisms and provided with a pin or lug for operating said pivoted cam to automatically reverse said trip-lever, all substantially as and for the purpose specified.

2. In a time-registering apparatus, substantially such as described, the combination, with the hour-hand shaft, of a scroll-shaped cam pivotally connected with said shaft, and a supplemental lever, as G′, jointed to a trip-lever and having a disk-plate in connection with said scroll-shaped cam, and a gear provided with a lug or pin, as $b^3$, for operating said cam, as and for the purpose specified.

3. In a time-registering apparatus, and in combination, two independent mechanisms constructed and arranged relatively to one another substantially as shown and described, a trip-lever pivoted to the frame of said apparatus and having its working end in connection with one of said mechanisms, and a supplemental lever pivoted to the frame of said apparatus and having one end jointed to said trip-lever and the other terminating in a plate which is in constant connection with a traveling pivoted cam of said other mechanism, as and for the purpose specified.

4. In a time-registering apparatus, substantially such as described, a gear-wheel, as $b$, journaled or placed loosely on the time-shaft B and having a pin, as $b^3$, in combination with a collar fixed to the hour-hand shaft, a scroll-shaped cam pivoted to a projection from said collar so as to swing or turn thereon, and a supplemental lever terminating in a plate upon which said cam travels, as and for the purpose specified.

5. In a time-registering apparatus, and in combination, two independent mechanisms, substantially such as described, a gear-wheel, as $b$, journaled or placed loosely on the time-shaft B of one of said mechanisms, and intermediate gear-wheels, as $b'$ $b^2$, connecting with the shaft C of the hour and minute hands of said other mechanism, whereby the movement of said hands is determined upon each tripping of said last-named mechanism, as specified.

6. In a time-registering apparatus, and in combination, two independent mechanisms, substantially such as described, a train of gearing, substantially as shown, for connecting said mechanisms in such manner as to permit one of them to operate while the other is at rest, a trip-pin arranged as shown on one of the wheels of said train, a cam arranged as shown relatively to said trip-pin, a trip-lever, and a supplemental lever jointed to said trip-lever and terminating in a plate arranged as shown relatively to said cam, as and for the purpose specified.

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