(No Model.) 4 Sheets—Sheet 1.

G. W. MACKENZIE.

STREET ADVERTISING APPARATUS.

No. 458,474. Patented Aug. 25, 1891.

Fig. 1.

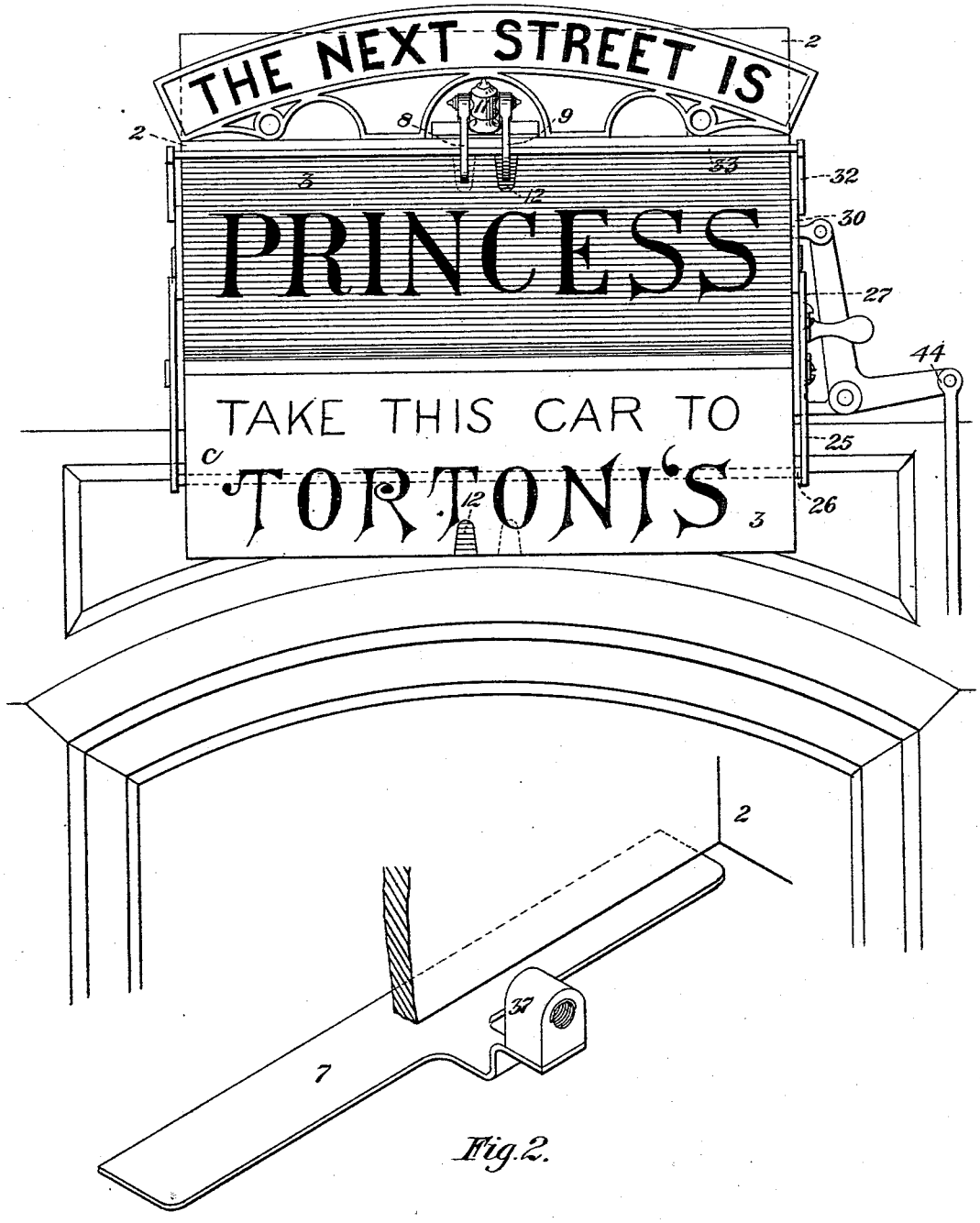


Fig. 2.

WITNESSES.

Thomas W. Boswell

C. M. Clarke

INVENTOR.

G. W. Mackenzie

(No Model.) 4 Sheets—Sheet 2.

G. W. MacKENZIE.

STREET ADVERTISING APPARATUS.

No. 458,474. Patented Aug. 25, 1891.

Fig. 4.

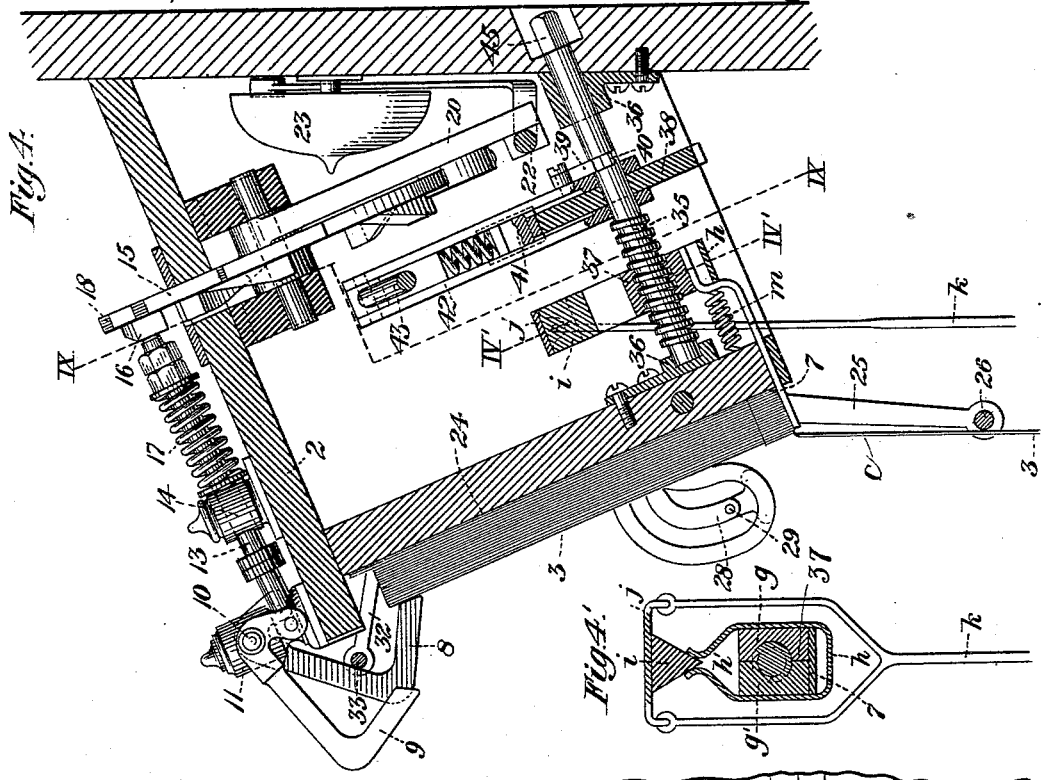
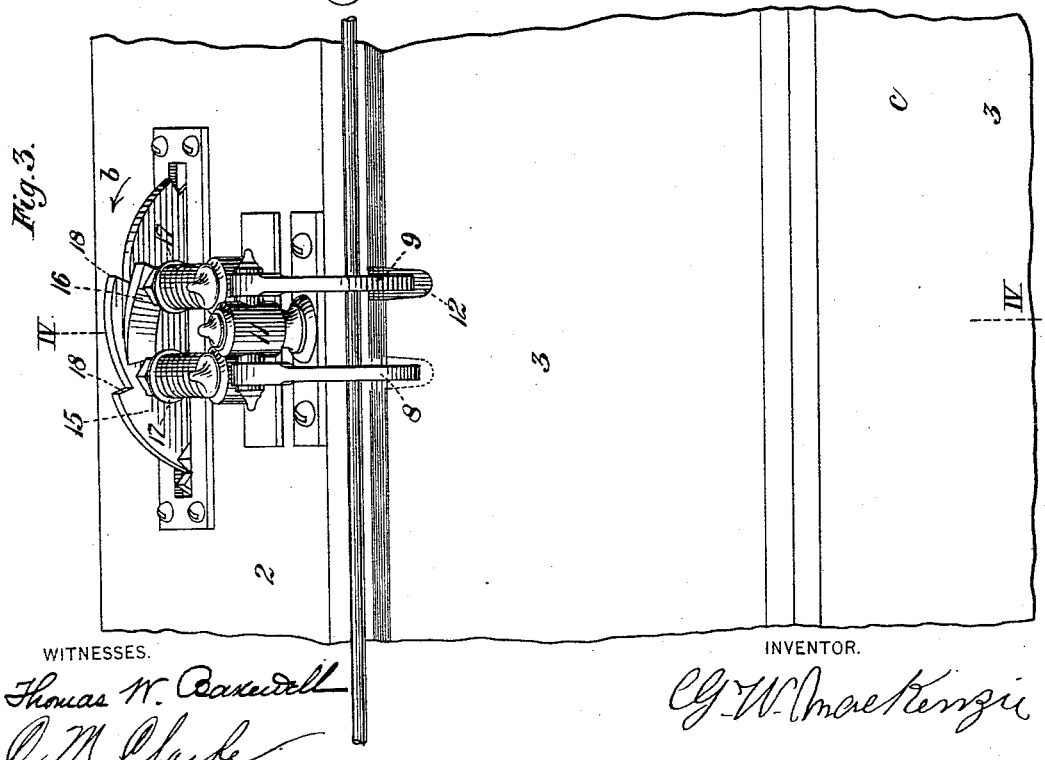


Fig. 4'.

Fig. 3.



WITNESSES.

Thomas W. Boxwell

C. M. Clarke

INVENTOR.

G. W. MacKenzie

(No Model.) 4 Sheets—Sheet 3.

G. W. MacKENZIE.

STREET ADVERTISING APPARATUS.

No. 458,474. Patented Aug. 25, 1891.

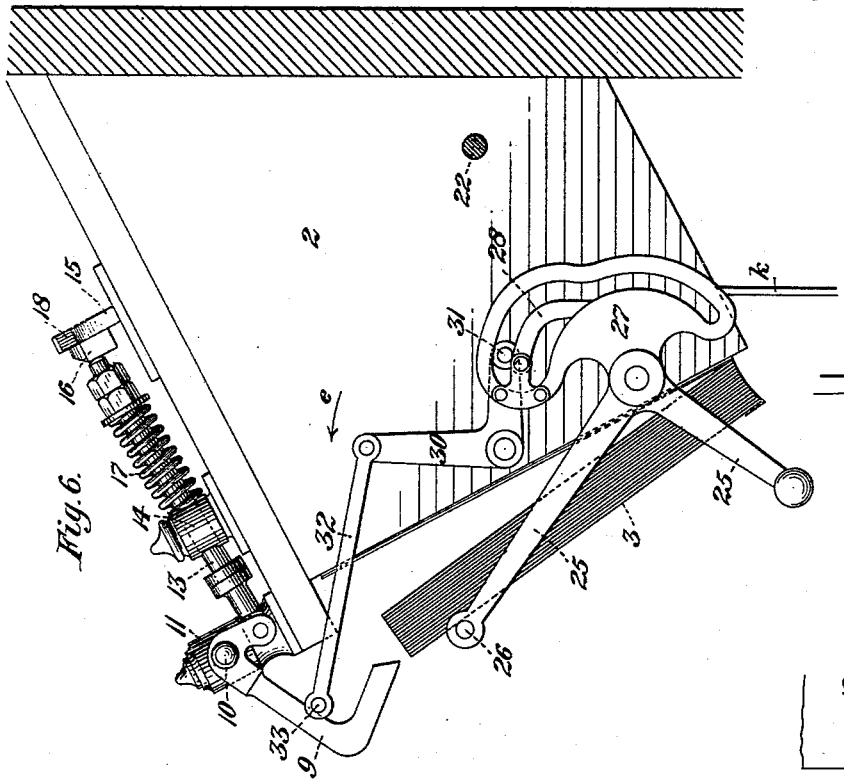
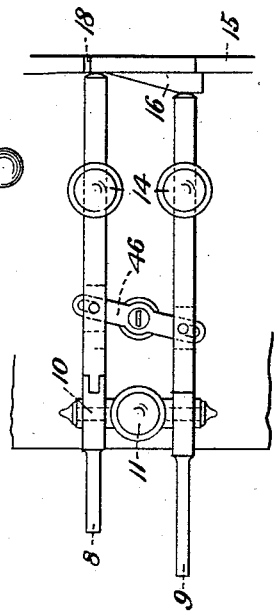
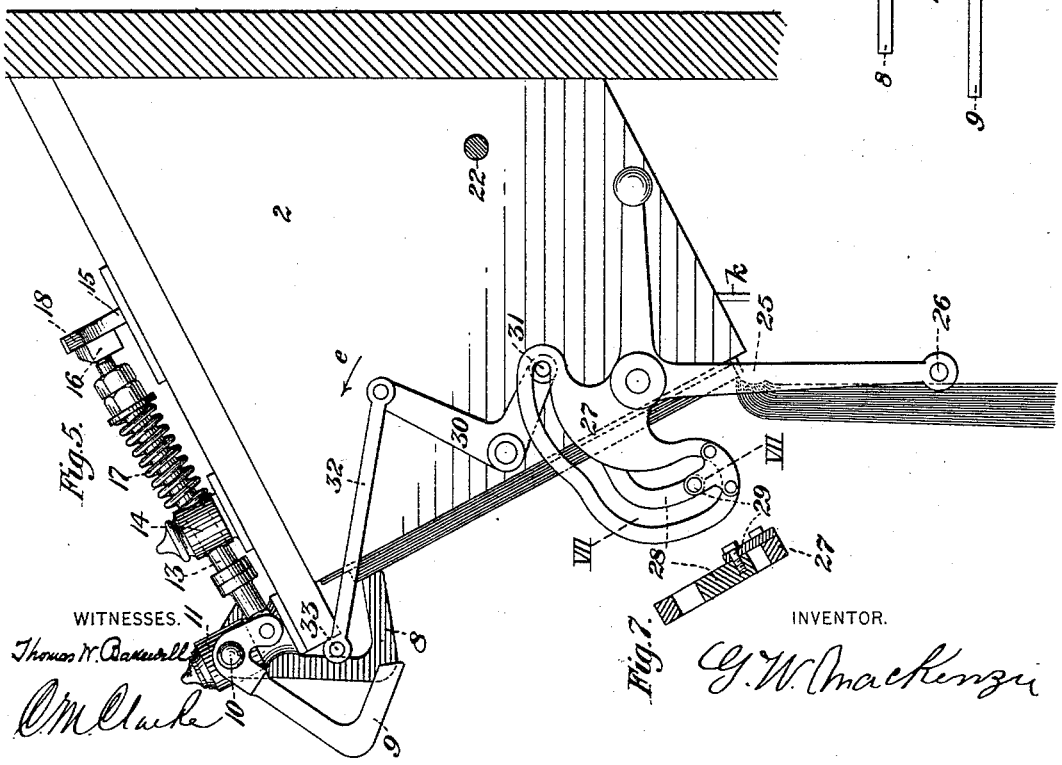


Fig. 8.





WITNESSES.

Thomas W. Bakewell

O. M. Clarke

Fig. 7.

INVENTOR.

G. W. Mackenzie

(No Model.) 4 Sheets—Sheet 4.

G. W. MacKENZIE.

STREET ADVERTISING APPARATUS.

No. 458,474. Patented Aug. 25, 1891.

Fig. 9.

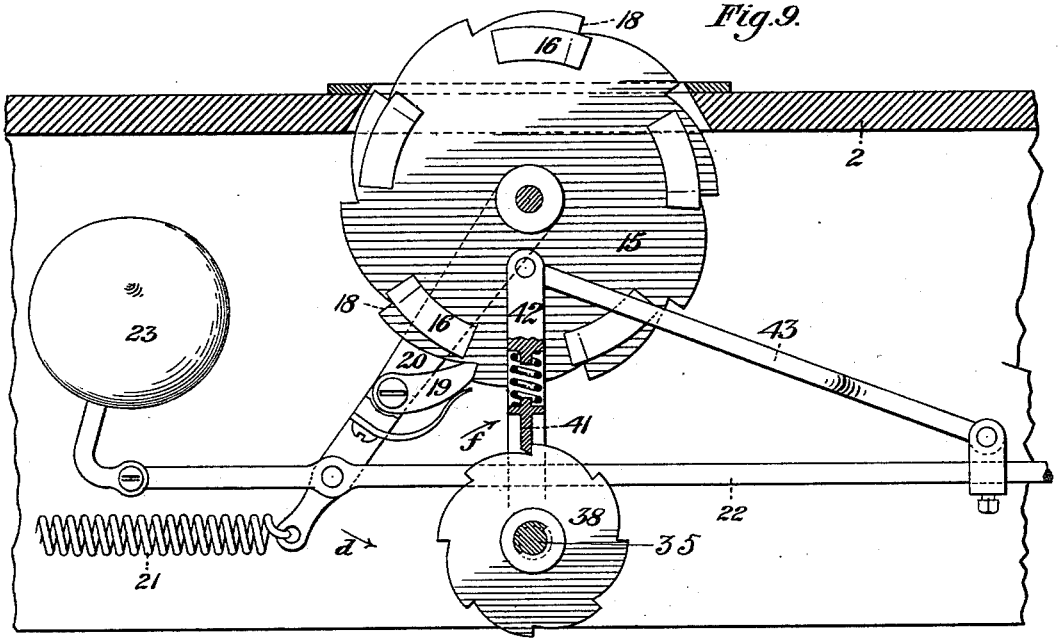


Fig. 10.

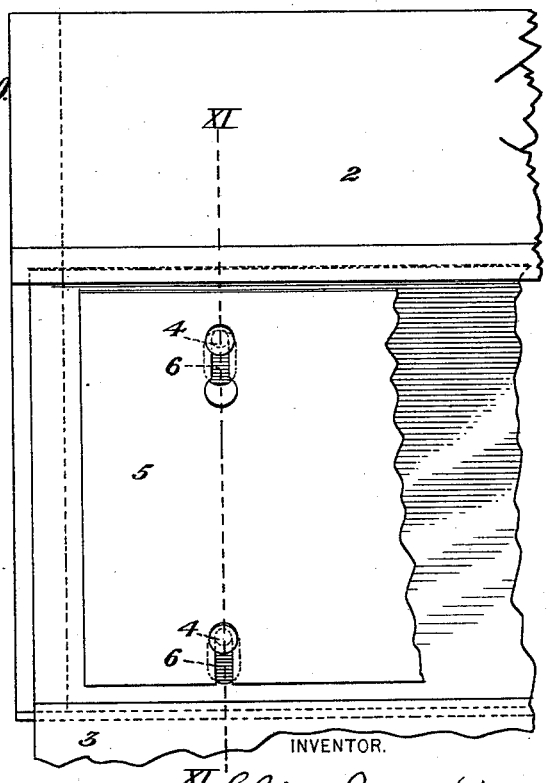
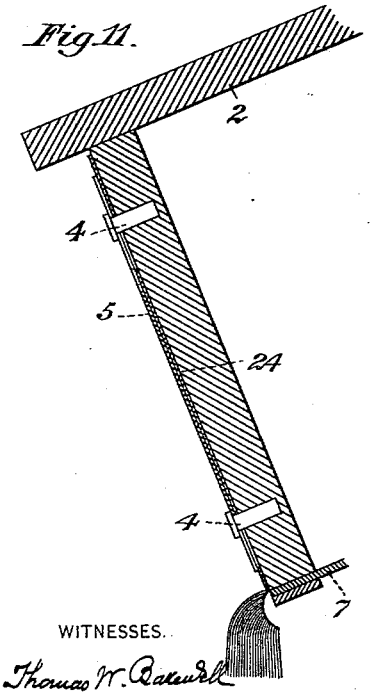


Fig. 11.



WITNESSES.

Thomas W. Bakewell

O. M. Clarke

INVENTOR.

G. W. MacKenzie

UNITED STATES PATENT OFFICE.

GEORGE W. MACKENZIE, OF VAN PORT, ASSIGNOR TO WILLIAM HARRY WILLIAMS, OF PITTSBURG, PENNSYLVANIA, AND ANNIE L. AVERILL, OF CHARLESTON, SOUTH CAROLINA.

STREET-ADVERTISING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 458,474, dated August 25, 1891.

Application filed June 23, 1890. Serial No. 356,409. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MACKENZIE, of Van Port, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Street Announcing or Advertising Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of my improved apparatus. Fig. 2 is a detail view in sectional perspective. Fig. 3 is a front elevation of part of the apparatus. Fig. 4 is a vertical sectional view on the line IV IV of Fig. 3. Fig. 4′ is a front elevation illustrating a modification. This view is shown as if in section on the line IV′ IV′ of Fig. 4. Figs. 5 and 6 are sectional side elevations showing the parts in different positions. Fig. 7 is a vertical section on the line VII VII of Fig. 5. Fig. 8 is a plan view showing a modified construction of the mechanism for operating the card-holding fingers. Fig. 9 is a vertical irregular section on the line IX IX of Fig. 4. Fig. 10 is a front elevation illustrating the manner of holding the back leaf of the book of indicating-cards. Fig. 11 is a cross-section on the line XI XI of Fig. 10.

Like symbols of reference indicate like parts in each.

My improved apparatus is designed primarily to be used on street-cars and railway-cars for indicating in succession the names of the streets and stations, and I shall so describe it. It is, however, applicable to other uses—for example, for indicating the hours of departure and arrival of trains, for advertising purposes, &c.

In my apparatus the indication of the streets, stations, &c., is performed by leaves or cards preferably bound together in book form. Each of said leaves has printed on one side the name of a street or station, and an advertisement may be printed on the reverse side. The book is held in position in the apparatus by suitable devices which successively retain and release the leaves, causing them to turn and to expose the names of the streets on the faces of the leaves and the advertisement on the backs. The form of mechanism which I employ for this purpose is remarkably simple in its construction and is efficient, and consists, broadly, in connecting the leaves together at their extreme rear edges in book form, setting them in a substantially upright position on their supporting-case, and using mechanism for successively exposing the leaves; and it also consists in a certain construction and arrangement of the parts of the mechanism, as hereinafter described and claimed.

In the drawings, 2 represents the box or case by which the parts of the apparatus are contained.

3 3 are the indicating leaves or cards, which are bound closely together at the extreme rear edges in book form. The book is held to the forwardly-inclined face 24 of the box by attachment of the back leaf thereto, as shown in Fig. 10. Studs 4 project through holes in the back leaf, and a metal plate 5, provided with holes and slots 6, is set on the studs outside the leaf, and when moved to engage with the studs it is locked in place and holds the back leaf securely. The bound end of the book is supported by a plate or shelf 7. The upper unbound margins of the leaves are held by means of fingers 8 and 9, preferably made in the form of small elbow-levers pivoted at 10 to suitable standards 11. These fingers are adapted to bear alternately against the outside leaf, one finger being elevated while the other is down. Each leaf is provided with a slot or notch 12 at its upper margin, the slots of the leaves being alternately placed opposite to the positions of the ends of the fingers (see Figs. 1 and 3)—that is to say, the slot or notch in one leaf is opposite to the position of the finger 8, the slot in notch of the next leaf is opposite to the position of the finger 9, and so on in succession. The fingers are operated by reciprocatory push-rods 13, which slide through suitable guide-standards 14, and whose ends are pivotally connected to the shorter arms of the finger-levers. To actuate these push-rods, I employ a rotary cam-plate 15, whose face is provided with a series of wedge-shaped blocks or cam-faces 16, each about equal in length to the distance between

the ends of the push-rods and each distant from each other a space equal to its own length. Each push-rod is fitted with a spring 17, which tends to push it back against the face of the plate 15, and the plate is provided with mechanism by which there may be imparted to it successive partial revolutions of equal extent, so that at the end of each partial revolution it shall be brought into the position shown in Figs. 3 and 4, in which the end of one push-rod is at the highest point of one of the cams 16 near the abrupt portion thereof, while the other is at the lowest point of the same cam or of the next succeeding cam in alternate succession. The consequence is that at the end of each motion of the cam-plate one of the fingers is elevated, while the other is depressed against the unslotted portion of the outermost leaf, and in these positions the said fingers alternate in their action.

The operation is as follows: As shown in Fig. 3, one finger 9 is elevated and is opposite the slotted portion of the outermost leaf, while the other finger is depressed against the unslotted portion thereof. If now the plate 15 be turned in the direction of the arrow *b*, the first effect is to cause the end of the push-rod of the finger 9 to escape from the abrupt end of the cam 16, thereby causing the end of the finger 9 to descend through the slot in the outermost leaf and to bear against the face of the next leaf below, while the push-rod of the finger 8, riding on the cam 16, is elevated from contact with the outermost leaf. The motion of the plate stops when the push-rod of the finger 8 reaches the top of the cam, and at this moment the push-rod of the finger 9 is at the base of the next succeeding cam. The effect of thus raising one finger and depressing the other is to free the outer leaf of the book, permitting it to drop into the position shown at *c* in Figs. 1 and 3 and to expose its rear face, on which an advertisement may be printed, as above described and as represented in Fig. 1. The next motion of the cam-plate raises the finger 9 and depresses the finger 8, and as at each partial revolution of the cam-plate the fingers are alternately raised and caused to drop they free in succession the leaves of the book. A variety of mechanical devices may be employed to operate this cam-plate; but the mechanism illustrated in the drawings is very efficient and simple. The plate 15 is provided with a series of ratchet-teeth 18, adapted to be engaged by a pawl 19, pivotally secured to a lever 20, which may have its axis of radial motion on the shaft of the plate, and is preferably provided with a spring 21, which tends to retract it, as illustrated in Fig. 9. The motion of the lever in the direction of the arrow *d* for the purpose of turning the plate is effected by means of a rod 22, which extends from the case 2 and may be provided with suitable connections 44, adapting it to be operated by the hand or foot of the car conductor or driver. It should be understood, however, that my invention is not limited to any specific means for rotating the cam-plate, since other mechanism—such as an electric or pneumatic motor or suitable automatic appliances—may be employed for such purpose. The rod 22 may be connected with the lever of an alarm-bell 23, so that a signal will be sounded at each operation of the apparatus. It is obvious that by reason of the construction above described each motion of the lever 20 in the direction of the arrow *d* will rotate the cam-plate and will thereby elevate one leaf-holding finger and depress the other, so as to drop one of the indicating leaves or cards. When all of the leaves have been dropped, as shown in Fig. 10, and it becomes necessary to raise them again, they may be lifted by hand against the face-plate 24, the fingers being raised to permit passage of the cards; but I prefer to effect this result by mechanical means such as are illustrated in Figs. 3, 4, 5, and 6. The case 2 is provided at its opposite sides with bell-crank levers 25, having their ends connected by a rod 26, which extends just back of the position of the depending leaves or cards. At each end of the shaft of these levers is a grooved or slotted cam 27, one portion of which cam has a double groove formed by a switch-arm 28, pivoted at 29 and arranged as shown in Figs. 5, 6, and 7. In connection with each of the cams I use a bell-crank lever 30, having at one end a pin 31, which fits in the groove or slot of the cam, and at the other end connected by a link 32 with a cross-rod 33, which fits under the fingers 8 and 9.

The operation is as follows: To raise the depending leaves of the book, the bell-crank lever 25 is turned, thus elevating the rod 26 and lifting the leaves, as shown in Fig. 6. The groove of each cam 27 for a considerable portion of its length is concentric with the axis of the cam, so that for the first part of the rotation of the cam with the lever no motion is imparted to the lever 30. When, however, the pin 31 reaches the pivoted tongue 28, the groove, becoming there eccentric, moves the lever 30 in the direction of the arrow *e*, and thereby raises the leaf-retaining finger, so as to permit the passage of the leaves beneath the same. When the leaves have been completely lifted, the pin 31, having reached the rear end of the tongue 28, abruptly descends in the cam-groove, thereby retracting the lever 30 and permitting the leaf-retaining finger to drop again upon the leaves and to hold them. The lever 25 may now be reversed and moved back to the position shown in Fig. 5, and in such reverse motion of which the cam 27 partakes, the concentric groove at the under portion of the tongue 28 passes along over the pin 31 without moving the pin and the lever 30. The pivotal connection of the tongue 28 permits the pin to pass freely into the part of the groove in which it is shown in Fig. 5.

I have found it desirable in using a book composed of a number of leaves or cards to support the lower or bound edge on a shelf in order to keep the book in shape and to hold the leaves in regular position. It is also desirable that this shelf should not project beyond the edge of the book, so that it may not interfere with the turning of the leaves. As the thickness of the edge of the book is diminished by successive turning of the leaves, it is necessary that the width of the supporting-shelf should be correspondingly diminished. This result I effect by the means which are most clearly illustrated in Fig. 4. The supporting-shelf 7 is set in a slot at the lower portion of the case 2, in which slot it is movable longitudinally, so that when projected to its full extent, as shown in Fig. 4, or partially projected, as shown in Fig. 5, it shall coincide with the thickness of the con joined edges of the upright leaves, and when entirely retracted, as shown in Fig. 10, it shall permit all the leaves to hang down. The retraction of the shelf is effected by means of a screw-shaft 35, journaled in suitable bearings 36 and passing through a nut 37, to which the shelf is fixed.

38 is a ratchet-wheel loosely set on the shaft 35 and connected therewith by a pawl 39, which engages with ratchet-teeth 40, formed on the shaft, said ratchet-teeth permitting motion of the wheel 38 independently of the shaft 35, in one direction only. The ratchet-wheel 38 is operated by means of a spring-backed pawl 41, set on a pawl-lever 42, which by means of a curved link 43 is connected with the rod 22, or it may be connected with other moving parts of the mechanism. Each time that the rod 22 is moved to drop one of the leaves or cards, as above described, it will also move the link 43 and lever 42 in the direction of the arrow *f*, thereby causing the pawl 41 to impart a partial rotation to the ratchet-wheel 38. This rotation is communicated to the screw-shaft 35 by means of the pawl and ratchet 39 and 40, and the turning of the screw-shaft will act on the nut 37 so as to draw it back a certain distance. By properly proportioning the pitch of the thread on the shaft 35 the motion of the nut may be regulated so that in extent it shall be equal to the thickness of one of the leaves of the book. It thus follows that at each operation of the apparatus the shelf is moved back a distance just equal to the thickness of the leaf dropped, and this action being continued successively to the time when all of the leaves have been dropped, the support afforded by the shelf will at all times be proportioned properly to the thickness of the leaves which rest thereon. It will be noticed that as the link 43 is connected to the rod 22 the spring 21, which serves to pull back the lever 20 for a new bite on the ratchet 18 after each operation of the apparatus, will also serve to pull back the pawl 41 on the ratchet 38.

When the leaves of the book are raised into an upright position, it is necessary to project the shelf. To this end I may provide the shaft 35 with a key-arbor 45, which enables the screw-shaft to be turned in a reverse direction through the nut 37, so as to project the shelf. Such reverse motion of the shaft is permitted by the pawl and ratchet 39 40.

More desirable means adapted to this end are shown in Fig. 4'. In this figure I show the nut made of two parts *g* and *g'*, held together by being fixed to the arms of a spring *h*, which may extend upwardly to form a fork *h'*. A wedge *i* rests between the arms of the fork *h'*, and is provided with a yoke or frame *j*, having an operating rod or connection *k*, which depends from the case 2. When it is desired to project the nut and shelf, the rod *k* is pulled, thus separating the parts of the nut and freeing them from the shaft, whereupon the shelf and nut may be pulled forward freely. I prefer, however, to employ a spring *m*, by which the shelf shall be pulled forward automatically as soon as the nut is released from the shaft. When the shelf is projected, the rod *k* is released, and thereupon the pressure of the spring *h* raises the wedge and draws the parts of the nut together again. Other mechanical devices may be employed for releasing the nut from the shaft to permit projection of the shelf.

It will be understood that many modifications in the form, construction, and relative arrangement of the parts of the apparatus may be made by the skilled mechanic without varying from the principles of my invention, as stated in the following claims. Thus suitable cogs or worm-gearing may be substituted for the ratchets and levers which I have shown in the drawings, and other changes can be made with the exercise of ordinary mechanical skill and intelligence. In Fig. 8 I illustrate one such modification which is designed for the operation of the push-rods 13. As shown in this figure, instead of providing such rods with springs, by which their back motion against the cam-plate is secured, I connect them together by means of the pivoted arm 46, so that as one push-rod moves forward it will draw the other rod back. While this arrangement is within the scope of my invention, I do not regard it as so desirable as the construction illustrated in the other figures.

The advantages of my invention will be appreciated by those skilled in the art. The apparatus is simple in construction; and is easy and certain in its operation. The use of indicating cards or leaves bound in book form is convenient, since it makes the work of fitting the apparatus with the cards easy and imparts a neat appearance thereto.

I claim—

1. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves, a case by which they are supported, alternately-acting fingers mounted on the case and adapted to engage and release the cards

or leaves in succession, and mechanism by which the fingers are moved alternately in opposite directions, substantially as and for the purposes described.

2. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves, a case by which they are supported, alternately-acting fingers pivotally mounted on the case and adapted to engage and release the cards or leaves in succession, and mechanism by which the fingers are alternately raised and depressed, substantially as and for the purposes described.

3. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves, alternately-acting fingers adapted to engage and release them in succession, and a rotary cam-plate having cam-faces 16, by which the fingers are operated, one being raised and the other depressed, substantially as and for the purposes described.

4. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves, a shelf by which the leaves are supported, said shelf being movable laterally from the leaves which it supports, and mechanism adapted to retract the shelf as the leaves are turned, substantially as and for the purposes described.

5. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves, mechanism adapted to turn said leaves in succession, a movable shelf by which the leaves are supported, and mechanism adapted to retract the shelf as the leaves are turned, said mechanism being connected with the leaf-turning mechanism, substantially as and for the purposes described.

6. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves set in an upright position, leaf-turning mechanism, and a lever situate back of the position into which the leaves are dropped, said lever being adapted to be raised to lift the leaves, substantially as and for the purposes described.

7. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves, alternately-acting fingers adapted to engage and release them in succession, mechanism by which the fingers are operated, and a lever situate back of the position into which the leaves are dropped, said lever being adapted to be raised to lift the leaves and being connected with the fingers and adapted to raise them to permit passage of the leaves, substantially as and for the purposes described.

8. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves alternately cut, substantially as described, and alternately-acting fingers situate opposite to the cut portions of the respective leaves and adapted to engage and release the leaves in succession, substantially as and for the purposes described.

9. In street-indicating apparatus, &c., the combination of a series of indicating cards or leaves, mechanism adapted to turn said leaves in succession, a movable shelf by which the leaves are supported, a screw-shaft, a divided nut mounted on the screw-shaft and connected with the shelf, and mechanism for separating the parts of the nut to free it from the screw-shaft, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 18th day of June, A. D. 1890.

GEORGE W. MACKENZIE.

Witnesses:

THOMAS W. BAKEWELL,

W. P. POTTER.