(No Model.) 2 Sheets—Sheet 1.

J. C. WOLFE.

TYPE WRITING AND ADDING MACHINE.

No. 538,807. Patented May 7, 1895.

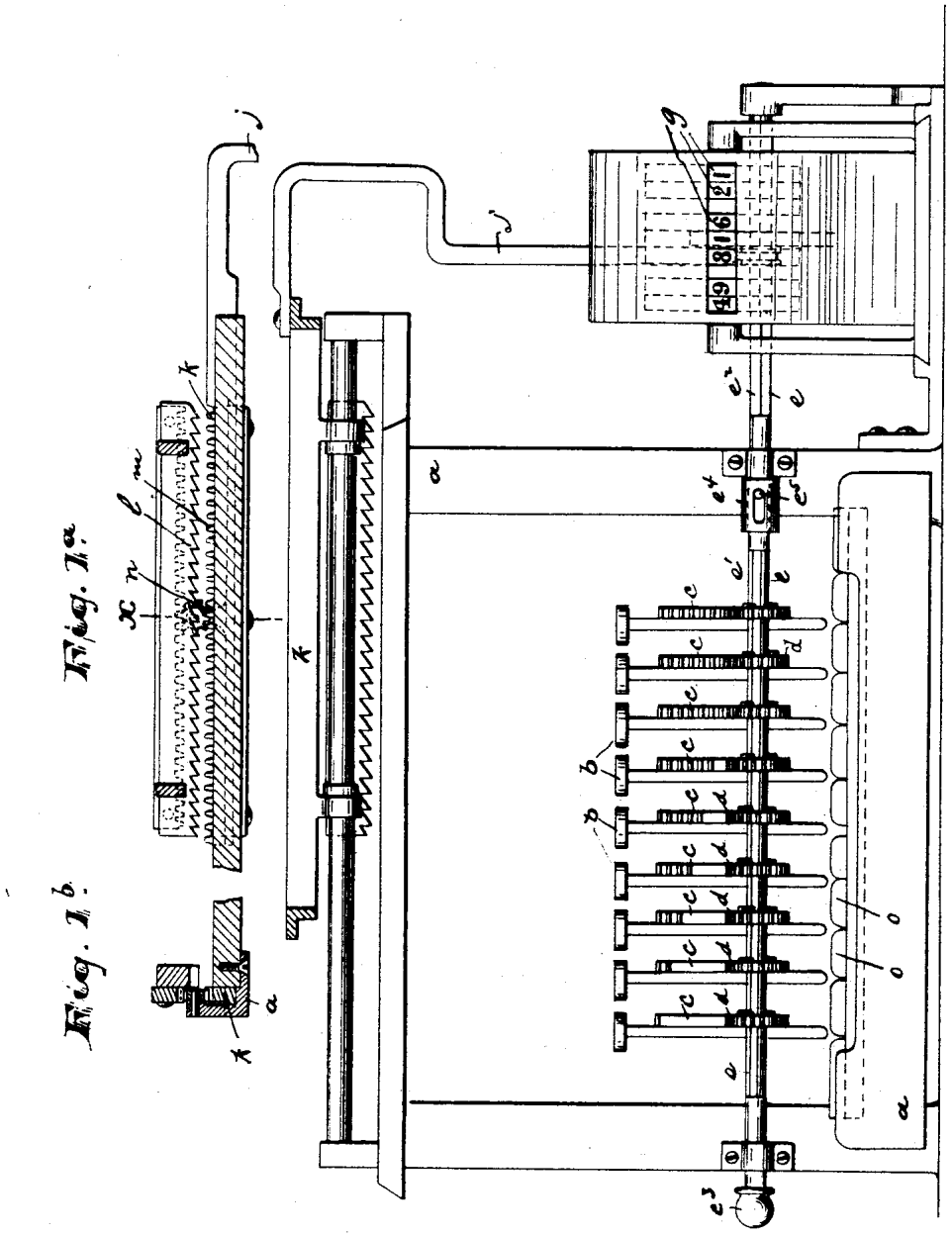

Fig. 1.

Fig. 1a.

Fig. 1b.

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INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

J. C. WOLFE.

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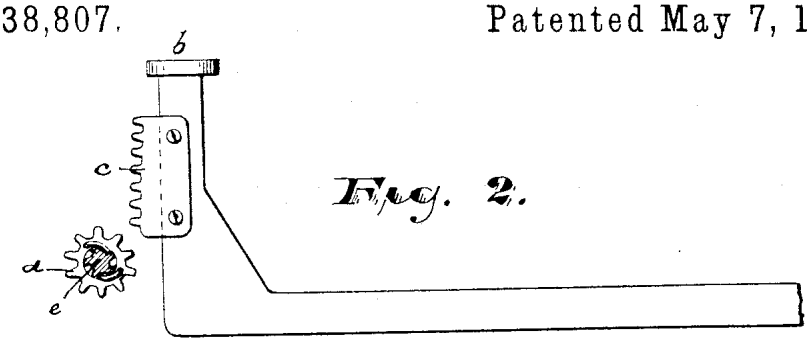

Fig. 2.

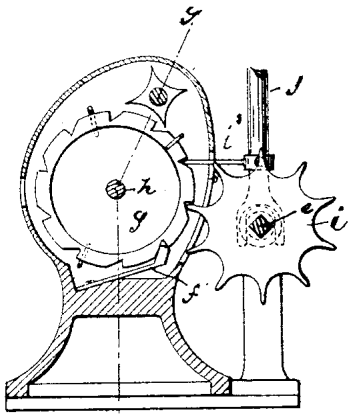

Fig. 3.

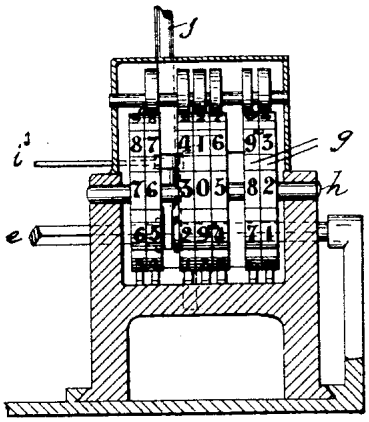

Fig 4.

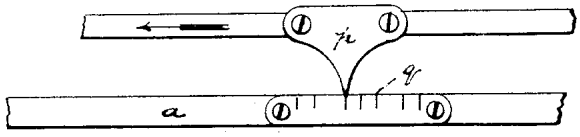

Fig. 5.

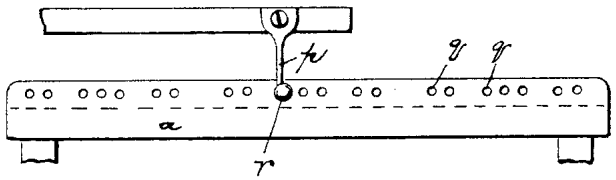

Fig. 6.

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UNITED STATES PATENT OFFICE.

JACOB C. WOLFE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO ISAAC BOEHM, OF SAME PLACE.

TYPE-WRITING AND ADDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 538,807, dated May 7, 1895.

Application filed March 13, 1894. Serial No. 503,413. (No model.)

To all whom it may concern:

Be it known that I, JACOB C. WOLFE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing and Adding Machines Combined; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in that class of typewriting and adding machines, having the type operable finger-keys, type and co-operating mechanisms for writing both words and numbers in the ordinary manner, the objects of the present improvements being to enable statements containing series of figures arranged in a column, or a plurality of columns, one independent of the other on the sheet, to be printed while employing the ordinary finger keys, and in connection with the operation of writing words or phrases with which said figures have a relation, and, at the same time that the column or the independent columns of figures are being formed, to add said column or columns of figures, so that, upon the completion of the work of printing the sheet, the total or totals will be revealed and may be printed by the operator at the foot of the column or columns without any mental calculations whatever.

Further objects are to facilitate the work of preparing statements and to do so with greater correctness and in a manner more easily readable after preparation, and to obtain other advantages and results, some of which will be referred to hereinafter in connection with the description of the working parts.

The invention is more particularly serviceable in connection with the work of railroad auditors' offices in making out the statements of claims of connecting railroads, or in apportioning moneys due from the one road issuing the tickets to other roads over which the passengers were carried by said tickets.

In the work of tabulating the results of business and reporting the same to said connecting lines, it is frequently necessary to prepare statements containing a number of independent columns, each of which is to be added separately. Similar columns of figures are made in the operation of classifying the earnings of the road into first, second, and third class, and excursion fares, as will be understood. In this work, and in other work to which the invention can be applied, it is necessary to provide a machine which can be readily operated to effect a writing and a corresponding addition, in any one of the plurality or series of columns, without affecting the others. It is also necessary to secure such a writing with comparative ease, with certainty of result and uniformity of impression.

With these ends in view, I have provided a machine which I will proceed to describe.

The invention consists in the improved typewriting machine, in the improved adding attachment therefor, and in the arrangements and combinations of the parts, substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which the same letters of reference indicate the same or corresponding parts in each of the views, Figure 1 is a front elevation of a portion of a type-writer having embodied therein the adding mechanisms. Fig. 1^a is a modified construction, which under certain circumstances is preferred. Fig. 1^b is a section of the same, taken at line x. Fig. 2 is a detail side elevation of a finger-key, showing a rack and pinion adapted to operate the driving-shaft of the adding mechanisms. Fig. 3 is a detail illustrating more clearly the construction of the adding-disks and driving mechanisms. Fig. 4 is a section through line y, and Figs. 5 and 6 are details of index-plates and pointers, which may be employed in connection with the machine, as hereinafter more particularly described.

In said drawings, a, indicates the frame of a type-writing machine of any suitable kind adapted to write words and phrases and in addition, having numbered type, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, for printing said characters. b, are the type-operating keys, grouped in any convenient manner, and arranged in connection with levers, or other suitable mechanisms

to operate the types in the manner common in typewriting machines.

The type, platen roll, and other co-operating parts, being all old, it is deemed unnecessary to illustrate and describe the same.

In connection with said finger keys, are racks, *c*, shown more clearly in Fig. 2, which engage pinions *d*, of an adding-attachment driving-shaft *e*. Said racks vary in length, the number of teeth in the racks increasing in regular succession corresponding with the figures on the keys, with which they are connected, the teeth on the key corresponding to the numeral 1, being sufficient to turn the pinion one degree or a distance so related to the other co-operating parts, as to produce on the numbering disk of the adding machine, a movement equal to one degree, the teeth on the rack of the "2" key having double the number of teeth of the "1" key, the "3" key, having three times the number, and so on in regular succession. Usually the one rack has one tooth, the next two teeth, the third three teeth, and so on, until the ninth rack which has nine teeth.

When the keys are depressed their full distance, to produce an impression on the sheet of paper, they will, at the same time, turn the pinions and the shaft connected therewith, a number of degrees to effect the numbering disk in accordance with the number of teeth upon the rack, or, otherwise, in accordance with the degree of movement of the shaft carrying the disk operating device. The said driving shaft, *e*, extends laterally beyond the group of keys and the frame of the typewriting portion of the machine, into a casing having numbered disks arranged therein. The said numbered disks have ratcheted or geared peripheries, and numbers from 0 to 9 inclusive thereon. These disks are so related, one to the other, as to turn ten degrees or movements, and then effect the next laterally adjacent disk or wheel to the left in the manner common in adding mechanisms. Said disks are prevented from moving unduly by means of a pawl *f*, or other suitable devices. The said disks or wheels, *g*, are arranged on a shaft *h*, within the casing, and are driven by a toothed wheel, *i*, arranged upon the driving shaft *e*. Said wheel, *i*, is movable laterally on the shaft *e*, so as to engage the said disks *g*, one after another, as the carriage of the typewriter moves laterally in the ordinary manner, the said wheel, *i*, being governed in its lateral movements, by an arm *j*, connected with the said carriage, *k*, so as to secure in the adding attachment, a movement of the wheel, *i*, that is simultaneous with, and equal in distance to the lateral and intermitting movements of the carriage.

Back movement of the shaft *e*, with the return movement of the keys, after the latter have been depressed by the finger, is prevented by any suitable ratchet or pawl mechanisms, shown in Fig. 2, the pinion *d* being loose on the shaft, and governed by the ratchet and pawl in any suitable manner.

I prefer to secure a movement of the wheel, *i*, and connecting rod *j*, in a direction opposite to that of the laterally moving carriage, and to secure this result, I employ, in connection with said carriage, a rack *l*, an oppositely moving carrier *m*, having a corresponding rack, and a pinion *n*, interposed between the two racks, so that, when the carriage moves in one direction, it will cause an opposite movement of the frame, *m*. The said carrier *m*, receives in this case, the connecting rod *j*, and operates the wheel *i*, on the driving shaft, as will be understood upon reference to Fig. 1ª. Other means may be employed to secure the opposite movement of the frame for driving the disk operating wheel.

The driving shaft, *e*, is preferably formed in sections e', e^2. The section e', carrying the pinions, is longitudinally movable from the section e^2, carrying the disk operating wheel, *i*, so that when it is desired to operate the typewriting machine, and its finger pieces, for other purposes than writing figures or numerals of the column to be added, the said section e', may be moved longitudinally, (a handle or finger piece e^3, being employed for that purpose,) so as to disengage the pinions from the racks on the finger keys. Any suitable coupling device may be employed to admit of a longitudinal movement of the pinion carrying section to disengage the said pinions from the racks. The preferred coupling consists of a slotted tube e^4 fixed to one section into which the other section works, its movement being limited by a pin, e^5, arranged in the slot of the tube.

To prevent more than one key being depressed at one time and thus causing an interference of parts, I have provided beneath the levers, as shown in Fig. 1, a series of sliding blocks or pieces, *o*, which are separable one from the others, the joints or openings between being directly beneath the key levers. The slot in which they work, is of a length equal to the lengths of the several blocks plus the thickness of one, and one only, of said levers and so when any one of said levers is pressed down, it enters the joint beneath and the blocks slide laterally to admit an entrance between; but should two levers be depressed simultaneously, both will be prevented from making an effective action because of a lack of space to allow a sufficient lateral movement of the blocks, all as will be understood.

To lock certain of the numbered and notched wheels, *g*, and particularly those that will not be affected by carrying operations, after the passage of the toothed master wheel, *i*, from engagement therewith, so that said wheels, *g*, cannot be disarranged accidentally or otherwise, I have provided a locking pawl plate, i^3, which is secured upon the arm, *j*, to move therewith and extends into engagement with such of the wheels, *g*, as are not to be affected

by carrying operations. This locking plate may be dispensed with without materially interfering with the operation of the invention.

The index device shown in Fig. 5, may be placed on any part of the machine within sight of the operator, the pointer, *p*, on the laterally moving part and the spaced indicating marks, *q*, on the stationary part of the frame.

In Fig. 6, the indicating marks are shown to be holes to receive a pin, *r*, against which the pointer impinges and by which the lateral movement of the pointer and its carriage is stopped. The pin is changeable in its position or can be removed from one hole and placed in another, at the will of the operator.

In operating the device, the columns of figures are simply written in type in the ordinary manner, the specific operations of type-operating parts varying in accordance with the construction of the machine employed. The movements of the keys are transmitted to the adding attachment by means of the racks, *c*, pinions, *d*, and shaft *e*. Said shaft turns the sliding toothed wheel, *i*, which engages the notched or ratcheted periphery of the opposite numbered disk, in the manner described, turning the same and causing the additions to be made automatically. For example, in writing and adding the numbers 345, 647, and 789, the operator would first set the machine so that the first type to be pressed down would stand in the hundreds place, and, by so doing, he would bring the toothed driving wheel, *i*, into contact with the third wheel of the adding attachment. He would then depress key "3" and its racks with three teeth and turn the shaft, *e*, the driving wheel and said third wheel with three notches and at the same time imprint the number 3 on the paper. In performing this operation, the carriage would move laterally one space by the usual ratchet and pawl mechanism employed commonly in typewriting machines, bringing the toothed wheel in coincidence with the tens wheel of the attachment. He then depresses the "4" key with its four teeth, imprinting the number 4, and the actions above described in connection with the adding attachment are repeated. The driving wheel is then brought to the units wheel when the "5" key is depressed, 5 is written on the paper and the units wheel is turned five units of space. He then returns the carriage, so that the number 647 can be written under the number 345, the units being under units, tens under tens and hundreds under hundreds, and first depresses the "6" key, next the 4 key, and then the key 7, the actions above described being repeated.

In printing and adding the next set of numbers, 789, after again setting the carriage and operating successively the keys, 7, 8, and 9 the carriage moving from space to space as described, there are carrying operations effected in connection with the adding wheels, the movement of one wheel, affecting the wheel before it, tens wheel for example, giving a forward movement one space to the hundreds wheel in the manner common to adding machines. After the typewriting and adding operations, the adding attachment will show at the slot, shown in Fig. 1, the total, 1,781.

It may here be stated that the pinions, *d*, are loose on the shaft, *e*, and clutched thereto by any ordinary clutching mechanism so that when the racks, *c*, are depressed, the pinions turn with the shaft, but in the opposite direction. They move independent of the shaft to allow a return of the keys and racks without affecting the shaft and the parts depending thereon.

Where a series or plurality of columns are to be formed and added in statement work, as above indicated, it is evident, that there must be a series or plurality of heads or attachments, having adding wheels therein, in correspondence with the columns to be written. By the construction described, it is evident that the wheel, *i*, on the shaft, *e*, and controlled in its lateral movements by the arm, *j*, can be thrown from one adding head or attachment to another, the said adding attachment remaining stationary and the wheels, *i*, alone being operated. I am thus enabled to operate to secure the desired word and number writing, and the adding of the columns, without being compelled to move the whole of the adding attachment at every depression of the numbered keys, as in other machines of which I am aware, an operation which would require an expenditure of very considerable power on the part of the operator, and, in the event of eight or ten columns being printed and added simultaneously a number frequently and ordinarily required in the line of work specified, an operation that would be practically impossible.

In my improvement, the operation of the finger key simply turns the shaft *e*, wheel *i*, and any of the several wheels of any of the several adding heads with which it may be in engagement, and each of the said adding heads, corresponding with the columns stand stationary at the side of the main type-writing machine in no wise clogging its movements, excepting as described.

I am perfectly well aware that changes may be made in the mechanisms without departing from the spirit of the invention, and, therefore, I do not wish to be understood as limiting myself to the specific devices shown and described.

Having thus described the invention, what I claim as new is—

1. The improved type-writing and adding machine in which is combined with the type-writing body portion, having a laterally movable paper carrying frame, and an arm *j*, extending therefrom to the adding attachment, and having a shaft *e*, connecting the type-writing body portion and the adding attachment, said shaft being operable by the type-

writing keys and carrying an adding-wheel operating wheel *i*, said wheel, *i*, being movable laterally by said arm, *j*, and an adding attachment containing adding wheels, substantially as set forth.

2. The improved type-writing and adding machine, in which is combined with the type-operating keys and the adding attachment, the former having graduated racks, of a sectional shaft connecting with the adding attachment and having pinions engaged by said racks, the sections carrying said pinions being longitudinally movable to throw the said pinions into and from engagement with the racks, and a coupling for the said sections, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of March, 1894.

JACOB C. WOLFE.

Witnesses:
CHARLES H. PELL,
LOUISA BROWNE.