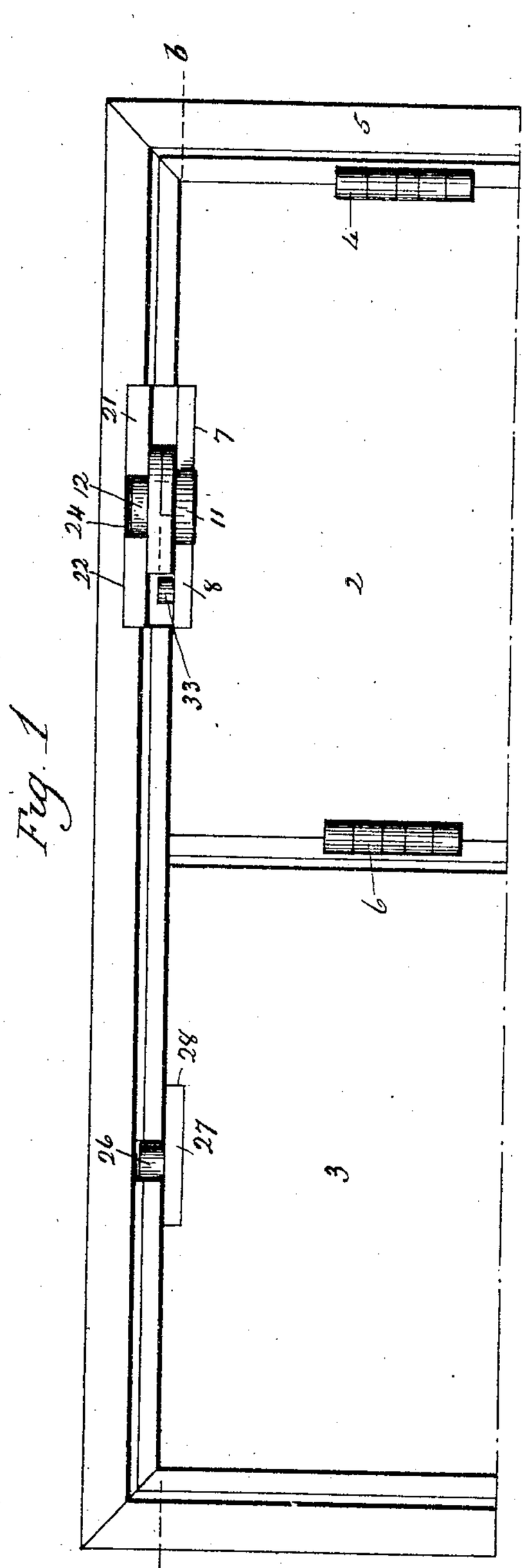
No. 786,569. PATENTED APR. 4, 1905.

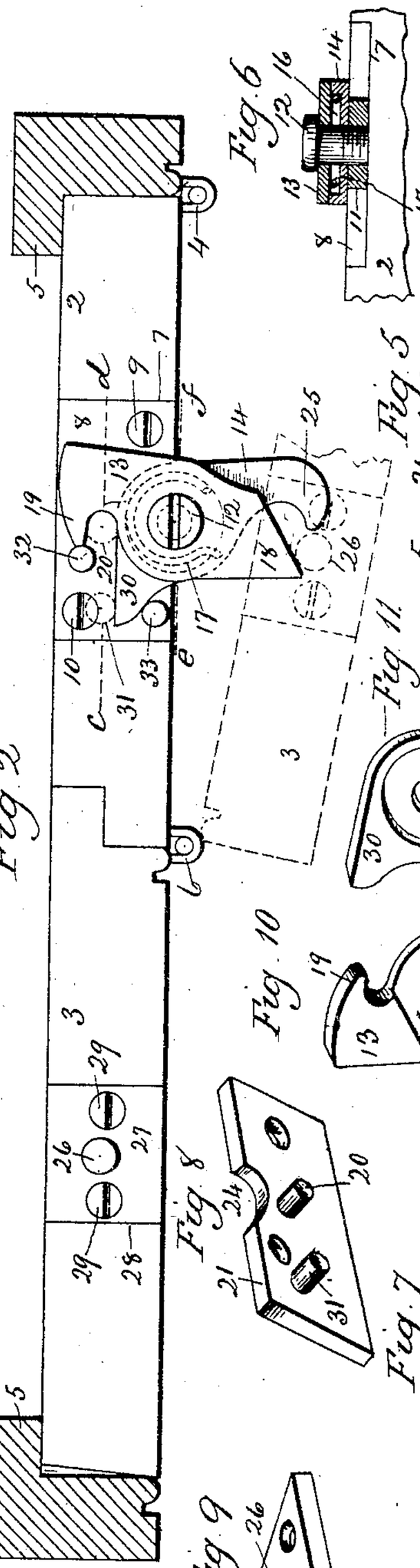
J. W. JONES.

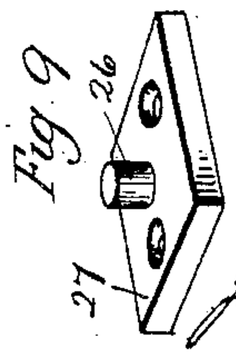
LOCKING MECHANISM FOR FOLDING DOORS.

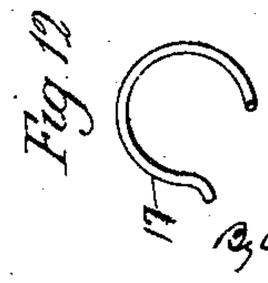
APPLICATION FILED SEPT. 19, 1904.

2 SHEETS—SHEET 1.









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Inventor.

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Fig. 3

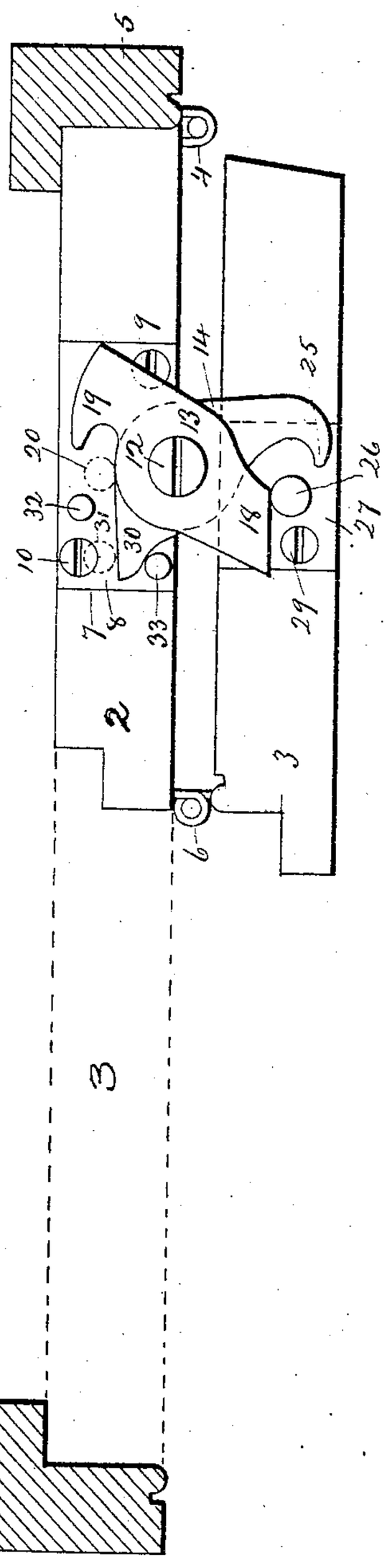
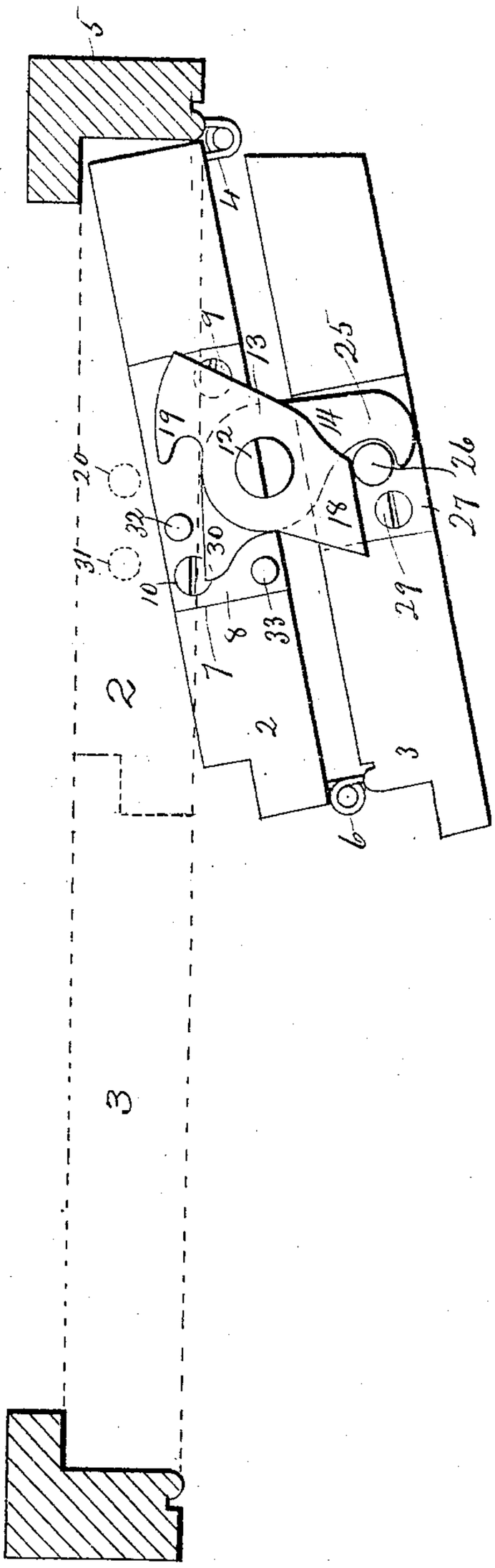


Fig. 4



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No. 786,569. Patented April 4, 1905.

UNITED STATES PATENT OFFICE.

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LOCKING MECHANISM FOR FOLDING DOORS.

SPECIFICATION forming part of Letters Patent No. 786,569, dated April 4, 1905.

Application filed September 19, 1904. Serial No. 224,982.

To all whom it may concern:

Be it known that I, JAMES W. JONES, a citizen of the United States, residing at West Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Locking Mechanism for Folding Doors; and I do hereby declare the following, when taken in connection with the accompanying drawings and the numerals of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a broken view, in front elevation, of a pair of folding doors constructed in accordance with my invention and shown in their closed positions in their door-jamb, the lower portions of the doors and jamb being broken away; Fig. 2, a view in horizontal section on the line *a b* of Fig. 1, showing the jamb in section and the doors in top plan, the second door being also shown by broken lines in the position which it has just before the jamb unlocking-stud carried by it begins to act upon the jamb unlocking-lever carried by the first door; Fig. 3, a corresponding view showing the second door in its fully-folded position in which it has swung the jamb unlocking-lever into its unlocked position; Fig. 4, a corresponding view showing the first and second doors as coupled together by the automatic action of the door-coupling lever when the swinging of the two doors away from their closed positions releases the said lever from the door-unlocking stud in the jamb; Fig. 5, a view in broken vertical section on the line *c d* of Fig. 2; Fig. 6, a corresponding view on the line *e f* of Fig. 2; Fig. 7, a detached perspective view of the bearing-plate which is mounted in the top of the first door; Fig. 8, a detached perspective view of the stud-plate which is secured to the jamb; Fig. 9, a detached perspective view of the stud-plate attached to the top of the second door; Fig. 10, a detached perspective view of the jamb locking-lever; Fig. 11, a corresponding view of the door-coupling lever; Fig. 12, a detached plan view of the spring employed for operating the jamb locking and door-coupling levers.

My invention relates to an improvement in locking mechanism for folding doors, the object being to provide a simple, compact, and durable automatic device constructed with particular reference to ease and convenience of operation and to relieving the hinges of the first door from strain.

With these ends in view my invention consists in a locking mechanism for folding doors, the said mechanism having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As herein shown, my improvement is applied to a pair of folding doors 2 and 3, which I shall respectively call the "first" and "second" doors, following the terms commonly used to distinguish such doors one from the other. The first door 2 is secured by hinges 4 to the door-jamb 5, while the second door 3 is secured by hinges 6 to the outer edge of the first door 2, all in the usual way. The upper edge of the first door 2 is centrally cut away to form a shallow recess 7 for the reception of a bearing-plate 8, secured in place by screws 9 and 10. This plate is formed with a forwardly-projecting lug 11, receiving a screw-stud 12, upon which a jamb locking-lever 13 and a door-coupling lever 14 are mounted so as to swing independently of each other, the lower face of the lever 13 being formed with a recess 15 to adapt it to fit down over the lever 14, which rests upon the said bearing-plate 8. To make the levers automatic in their action, the upper face of the lever 14 is formed with a recess 16, receiving a spring 17, the respective ends of which are connected with the respective levers, so that the spring constantly exerts an effort to swing the levers into their coupling positions. The outer end of the jamb locking-lever 13 is formed with a beveled tail 18, while its inner end is formed with a jamb locking-hook 19, adapted to engage with a jamb locking-stud 20, depending from a stud-plate 21, set into a recess 22, formed in the horizontal upper member of the jamb 5 and secured in place by screws, the outer edge of this plate being formed with a recess or notch 24 to clear the screw-stud 12 when the first door is in its closed position. The outer end of the door-

coupling lever 14 is formed with a door-coupling hook 25, coacting with an operating-stud 26, mounted in and extending upwardly from a stud-plate 27, located in a shallow recess 28, formed in the center of the upper edge of the second door 3 and secured in place in the said recess by screws 29. This stud 26 coacts with the beveled tail 18 of the jamb coupling-lever 13 to swing the same into its unlocked position and is engaged by the hook 25 of the door-coupling lever 14 for coupling the two doors together. The inner end of the door-coupling lever 14 is formed with a beveled tail 30, which coacts with a door-uncoupling stud 31, mounted in and depending from the stud-plate 21 and located in line with the stud 20 before mentioned. These studs 20 and 31 are adapted in length to just clear the bearing-plate 8 when the first door 2 is in its closed position. Stop-pins 32 and 33, mounted in the bearing-plate 8, are located on opposite sides of the tail 30 of the door-coupling lever 14 and limit the swinging movement thereof.

Having now described the construction of my improved mechanism in the form chosen for illustration, I will proceed to set forth the mode of its operation. Supposing the doors to be unfolded and being swung into their closed positions in the door-jamb, then just before the first door 2 swings home into the jamb the beveled outer edge of the hook 19 of the jamb locking-lever 13 will engage with the jamb locking-stud 20, whereby the said lever will be swung on the screw-stud 12 against the tension of the spring 17 until the nose of the hook has passed the center of the pin, after which the said spring will react to turn the lever on the stud 12 and fully engage its hook 19 with the stud 20, thus automatically locking the first door 2 to the door-jamb. At the same time as the first door 2 is moving into its home position, as above described, the beveled tail 30 of the door-coupling lever 14 engages with the door-uncoupling stud 31, whereby the said lever 14 is swung on the screw-stud 12 in the opposite direction from the direction in which the lever 13 has just been swung, with the effect of increasing the tension of the spring 17 and of moving its door-coupling hook 25 into its open or receiving position. The first door 2 being now firmly coupled to the door-jamb, the second door 3 may be swung back and forth upon the first door 2 as though the first door were the jamb itself without imposing any undue strain upon the hinges 4. Now to automatically unlock the first door 2 from the door-jamb the second door 3 is swung into the position shown by broken lines in Fig. 2, whereby its operating-stud 26 is brought into engagement with the beveled tail 18 of the jamb locking-lever 13. Now as the second door 3 is swung into its fully-folded position, in which it occupies a plane parallel with the plane of the first door 2, as shown in Fig. 3, the said operating-stud 26, acting upon the tail 18 of the door-locking lever 13, operates to swing the same on the screw-stud 12 against the tension of the spring 17, whereby the jamb locking-hook 19 of the said lever 13 is disengaged from the jamb locking-stud 20, thus unlocking the first door 2 from the door-jamb 5, as shown in Fig. 3. The first door 2 having thus been unlocked from the door-jamb both doors are free to be swung open. At the beginning of this opening movement the tail 30 of the door-coupling lever 14 is moved away from the door-uncoupling stud 31, giving the spring 17 a chance to act to turn the said lever 14 so as to engage its door-coupling hook 25 with the stud 26, carried by the second door 3, so that during the first half-inch or inch of the opening movement of the two doors they will be automatically coupled together. Indeed, it may be said that as soon as the two doors are started being opened they are coupled together. The two doors may now be handled to all intents and purposes as one door, with very much less strain on the hinges 4 of the first door 2 than if the second door 3 were allowed to swing free, in which case the leverage upon the said hinges 4 would be very much greater. The danger of straining the hinges 4 by collisions of any sort with the second door is also avoided by having the two doors coupled together. When the two doors are again swung back home toward the jamb, the coaction of the jamb locking-lever 13 with the stud 20 automatically recouples the first door with the jamb, while the coaction of the door-coupling lever 14 with the door-uncoupling stud 31 automatically uncouples the second door from the first door, as already described.

It is apparent that in carrying out my invention some changes from the construction herein shown and described may be made—as, for instance, in adapting the mechanism to be used on shutters or blinds, on which it may be used with good results. I would therefore have it understood that I do not limit myself to the form set forth, but hold myself at liberty to make such departures therefrom as fairly fall within the spirit and scope of my invention.

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

1. In a locking mechanism for folding doors, the combination with a jamb locking-lever and a door-coupling lever mounted upon the first door of a pair of folding doors, of means carried by the second door of the pair and by the jamb for coacting with and automatically operating the said levers.

2. In a locking mechanism for folding doors, the combination with a spring-actuated jamb locking-lever and a spring-actuated door-coupling lever both mounted upon the first

door of a pair of folding doors, and means carried by the jamb and by the second door of the pair for coacting with the inner and the outer ends of the said levers to render their action automatic.

3. In a locking mechanism for folding doors, the combination with a jamb locking-lever and a door-coupling lever both mounted upon the first door of a pair of folding doors, an operating-stud carried by the second door of the pair and coacting with the outer ends of the said levers, and studs mounted in the jamb and coacting with the inner ends of the said levers which are automatically operated by the said three studs.

4. In a locking mechanism for folding doors, the combination with a jamb locking-lever mounted upon the first door of a pair of folding doors and formed at its outer end with a beveled tail and at its inner end with a hook, of a door-coupling lever also adapted to be mounted upon the first door of the pair and formed at its outer end with a hook and at its inner end with a beveled tail, and means carried by the second door of the pair and by the jamb for coacting with the hooks and tails of the said levers to render their action automatic.

5. In a locking mechanism for folding doors, the combination with a bearing-plate applied to the top of the first door of a pair of folding doors, of a jamb locking-lever and a door-coupling lever mounted upon the said plate, an operating-stud located in the top of the second door of the pair and coacting with the outer ends of the said levers, and a stud-plate mounted in the jamb and carrying two depending studs coacting with the inner ends of the said levers which are automatically operated by the said three studs.

In testimony whereof I have signed this specifiation in the presence of two subscribing witnesses.

JAMES W. JONES.

Witnesses:
H. W. BUBE,
JAMES BERRY.